

Draft Conceptual Report

**91ST AVENUE WASTEWATER TREATMENT PLANT
EFFLUENT DISCHARGE ROUTE STUDY**



*Project Index No. S-933887
Contract No. 68292*

*Prepared For:
City of Phoenix, Water Services Department*

Prepared By:
Greiner

March 1995

Letter of Transmittal

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Subject EFFLUENT DISCHARGE ROUTE STUDY AT THE 91ST AVENUE WWTP

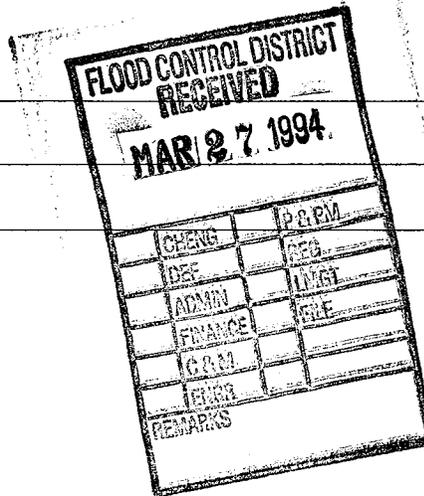
Reference # E10037600 Please refer to this number in all correspondence.

Attached please find:

1 COPY - DRAFT CONCEPTUAL REPORT

- For Review and approval/comment
- Signature and return
- Appropriate action
- As requested
- For your information

Remarks SEE ATTACHED MEMO



We are happy to be of service.

Sincerely yours,
Greiner, Inc.

By Alfred L. Baldt

Copy FILE

Greiner

MEMORANDUM

DATE: March 24, 1995

TO: To Whom It May Concern

FROM: Alison Boldt, Greiner, Inc.

SUBJECT: Draft Conceptual Report for the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant

Enclosed is a copy of the Draft Conceptual Report for the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant. Please review the document and return any comments you may have to Greiner, Inc. by Wednesday, March 29, 1995. If you have any questions regarding the report, don't hesitate to call me at (602) 275-5400. Thank you for your time.

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91st Avenue Wastewater Treatment Plant
Effluent Discharge Route Study*

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1.0 STUDY INTRODUCTION

1.1 LOCATION

This project is a study and preliminary design of the effluent discharge route for the 91st Avenue Wastewater Treatment Plant (WWTP). The WWTP is located on 91st Avenue south of Broadway Road and north of the Salt River within the Phoenix metropolitan area. The six cities that contribute influent to the 91st Avenue WWTP comprise the Subregional Operating Group (SROG). These six cities are Mesa, Tempe, Phoenix, Glendale, Scottsdale and Youngtown. The treated effluent from the WWTP is currently discharged into a canal flowing parallel to the Salt River along its northern border. The canal flows westward past 91st Avenue, discharging the effluent downstream into the Salt River. The study area is targeted at the effluent as it originates from 91st Avenue and flows westward to 115th Avenue. This area is located in Sections 31, 32, 33 and 34 of Township 1 North and Range 1 East of the Gila and Salt River Base and Meridian as shown in **Figure 1.1**. Beyond 115th Avenue, the effluent currently follows in the more centrally located low flow channel of the Salt River.

1.2 AUTHORIZATION

Residents of the Holly Acres subdivision located along the northern edge of the Salt River between 91st Avenue and 115th Avenue have experienced flooding of their properties during incidences of high flows in the Salt River. The residents believe that the presence of the effluent channel in the river has lowered their property value and quality of life due to odors and insects which result from areas of ponding and stagnant water. The City of Phoenix retained Greiner, Inc. to perform the effluent route study under Contract No. 68292, Project No. S-933887. The purpose of this study is an investigation of a short-term solution that will improve the quality of life of the nearby residents by moving the effluent channel as far from their properties as possible. This consists of analysis of different effluent route alignments, including return of the effluent channel to its historical southern alignment. Flood control is not included in the scope of this study.

1.3 OBJECTIVE

The goal of the project is to investigate an effluent discharge route that will ensure the 91st Avenue Wastewater Treatment Plant outfall, while enhancing the quality of the adjacent Salt River and downstream properties. To meet this goal, alternative discharge routes have been evaluated that will deliver the effluent discharge in a more southerly path. By changing the discharge path, the effluent will reach the Agua Fria River in a more timely manner. The intent is to reduce the presence of stagnant water in low pocket areas which will, in turn, reduce insect populations and lessen odor problems in the residential areas located along the northern border of the river. The impact of the alternative discharge routes on vegetation and wildlife within

the study area was considered. Proposed channel cross-sections are trapezoidal in design and consist of cut and fill combinations for construction. A Neighborhood Citizens Committee has worked closely with the project study team with regard to the routes and their impacts.

1.4 STUDY FORMAT

The work required for this project was divided into the following four phases with a provisional fifth phase for permit applications if deemed necessary. The various phases include the following study tasks:

Phase 1

- ▶ Define Project Goals, Opportunities and Constraints
- ▶ Acquire and Define the 91st Avenue WWTP Operation and Discharge Requirements
- ▶ Identify and Define Regulatory Requirements and Permit Constraints
- ▶ Organize and Establish Partnering
- ▶ Research and Collect Data
- ▶ Prepare Database and Base Map

Phase 2

- ▶ Development of the Concept
- ▶ Preliminary System Layout
- ▶ Discharge Channel Stability and Efficiency
- ▶ Capital & Life Cycle Costs
- ▶ Impact Assessment / Mitigation
- ▶ Preliminary Project Summary

Phase 3

- ▶ Consolidation of the Concept
- ▶ Consolidation of Alternatives
- ▶ Improvement Concept

Phase 4

- ▶ Final Refinement / Preliminary Design
- ▶ Conceptual Plans
- ▶ Reports

The study objective has been accomplished through monthly workshops with City of Phoenix staff, members of the Neighborhood Citizens' Committee, various regulatory agency representatives and Greiner, Inc., as well as through four public meetings to allow the surrounding community to provide input.

The project study team consists of the following individuals representing the City of Phoenix, the Neighborhood Citizens' Committee, various regulatory agencies and Greiner, Inc.:

**Effluent Discharge Route Study
Committee Members**

City Representatives:

Paul Kinshella, City of Phoenix
Madeline Goddard, City of Phoenix
Manny Bahraini, City of Phoenix
Gary Ullinskey, City of Phoenix

Neighborhood Citizens' Committee:

Adron Reichert, Citizen
William (Fritz) Amator, Citizen
Carroll Brogdon, Citizen

Federal, State and County Representatives:

Marvin Murray, Bureau of Reclamation
John Svehovsky, Flood Control District of Maricopa County
Felicia Terry, Flood Control District of Maricopa County
Ron McKinstry, U.S. Fish and Wildlife
Russell Haughey, Arizona Game and Fish Department
James Matt, Arizona Department of Environmental Quality
Lisa Zinner, Arizona Department of Environmental Quality

Project Consultants:

Shi-En Shiau, Greiner, Inc.
Candace Huff, Greiner, Inc.
Alison Boldt, Greiner, Inc.

A total of nine monthly meetings were held throughout the study. Attached as **Appendix A** are the minutes from all the monthly meetings for this study. The meetings served as "brainstorming" workshops for the City of Phoenix, Greiner, Inc. and the Neighborhood Citizens' Committee to develop the most feasible effluent alignments which would achieve the project goal. The meeting minutes provide a comprehensive summary of the study and its development. *Section 4.3.2, Public Input*, discusses the four public meetings which were held periodically throughout the duration of this study.

2.0 PLANT OPERATION AND DISCHARGE

2.1 NORMAL OPERATION

The 91st Avenue WWTP is a secondary treatment facility which treats both industrial and domestic wastewaters originating in the Phoenix metropolitan area. The 91st Avenue WWTP is comprised of five sub-plants, all connected hydraulically. They are identified as Plants 1A, 1B, 2A, 2B and 3A. The WWTP first began operation in 1958 treating five million gallons per day (mgd) of influent. This plant was later abandoned and replaced with a 45 mgd plant. In 1969, 1976, 1984 and 1989, the WWTP was expanded with Plants 1B, 2A, 2B and 3A, respectively. The current combined nominal capacity of the five sub-plants comprising the WWTP is 154 mgd. The total amount of influent is contributed to the WWTP by the six SROG members (Mesa, Tempe, Phoenix, Glendale, Scottsdale and Youngtown) in varying amounts. The approximate typical percentage of influent contributed by each of the cities is shown graphically in **Figure 2.1**.

Influent wastewater enters the WWTP through the headworks facility located within the northern portion of the facility site. The influent passes through bar screens and grit removal facilities prior to being split among the five sub-plants.

Each of the five sub-plants contains two primary sedimentation basins for removal of floating material and settleable solids; two aeration tanks for the introduction and solution of air into the wastewater; and one secondary sedimentation basin for further settlement of solids.

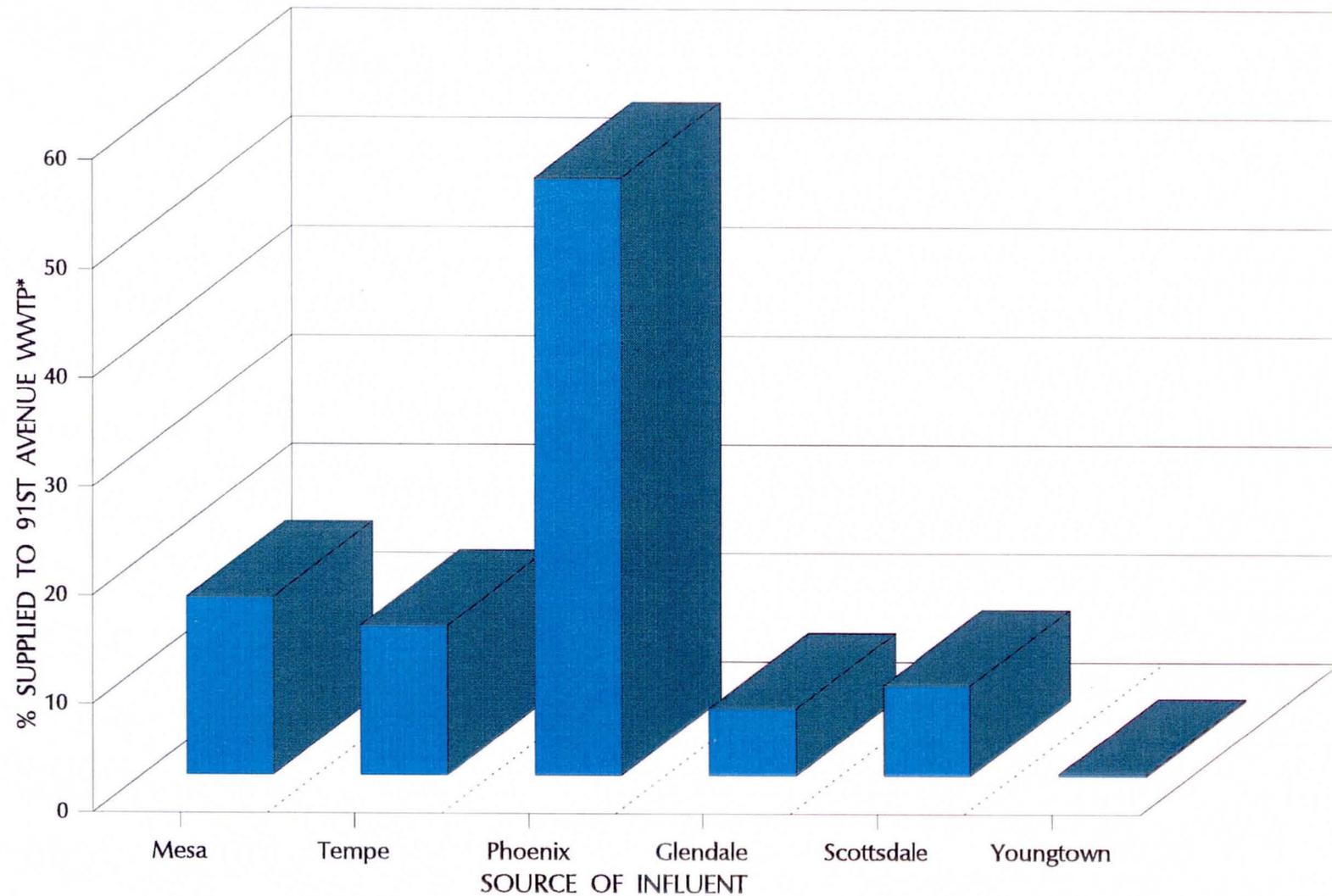
Following secondary sedimentation, the wastewater flows through three effluent channels to the chlorine contact chambers for chlorination and sodium bisulfate injection for dechlorination. Prior to the chlorine disinfection facilities, the effluent flows through an Arizona Nuclear Power Plant (ANPP) junction box which diverts flow as necessary to the ANPP pipeline.

Upon passing through the chlorine contact chambers, treated wastewater is discharged to the Combined Plant Outfall Channel. This channel discharges effluent into the existing effluent channel located in the Salt River bed.

2.2 EMERGENCY OPERATION

Due to record rainfall levels occurring throughout Arizona in January, 1993, and a higher than normal amount of snow within the Salt River watershed, an Emergency Flood Response Plan (Project Index No. S-905026) was prepared in anticipation of repeated elevated flow rates in the Salt River due to snow melt in the spring. The Plan was produced to be used as a last resort action to protect the WWTP from extensive damage, while allowing partially treated wastewater to be discharged to the Salt River.

INFLUENT SUPPLIED TO 91ST AVENUE WWTP



* Estimated values based on 1990 data contained in the *Status Report on the Subregional Operating Group and the 91st Avenue WWTP (4)*.

Figure 2.1

The Plan calls for diverting influent at the headworks of the facility to an open storage area north of the main access road. The temporary storage area would provide detention time for some degree of settlement. Preliminary chlorination will be achieved by placing temporary chlorine facilities at the headworks and at the discharge point of the storage area. Upon discharge from the temporary storage area, the wastewater will flow south in a temporary earthen channel located adjacent to 91st Avenue and discharge to the Salt River. Along with the implementation of this Plan, consideration will be taken for possible increased diversion through the ANPP pipeline for discharge to the Hassayampa River.

2.3 SEASONAL FLUCTUATIONS

The daily influent flow to the WWTP varies in a typical diurnal pattern as indicated by **Figure 2.2**. In the morning and early evening hours, the plant typically experiences peak influent flows. Lower flows are typical of late night hours when less water is being used by the treatment plant service area.

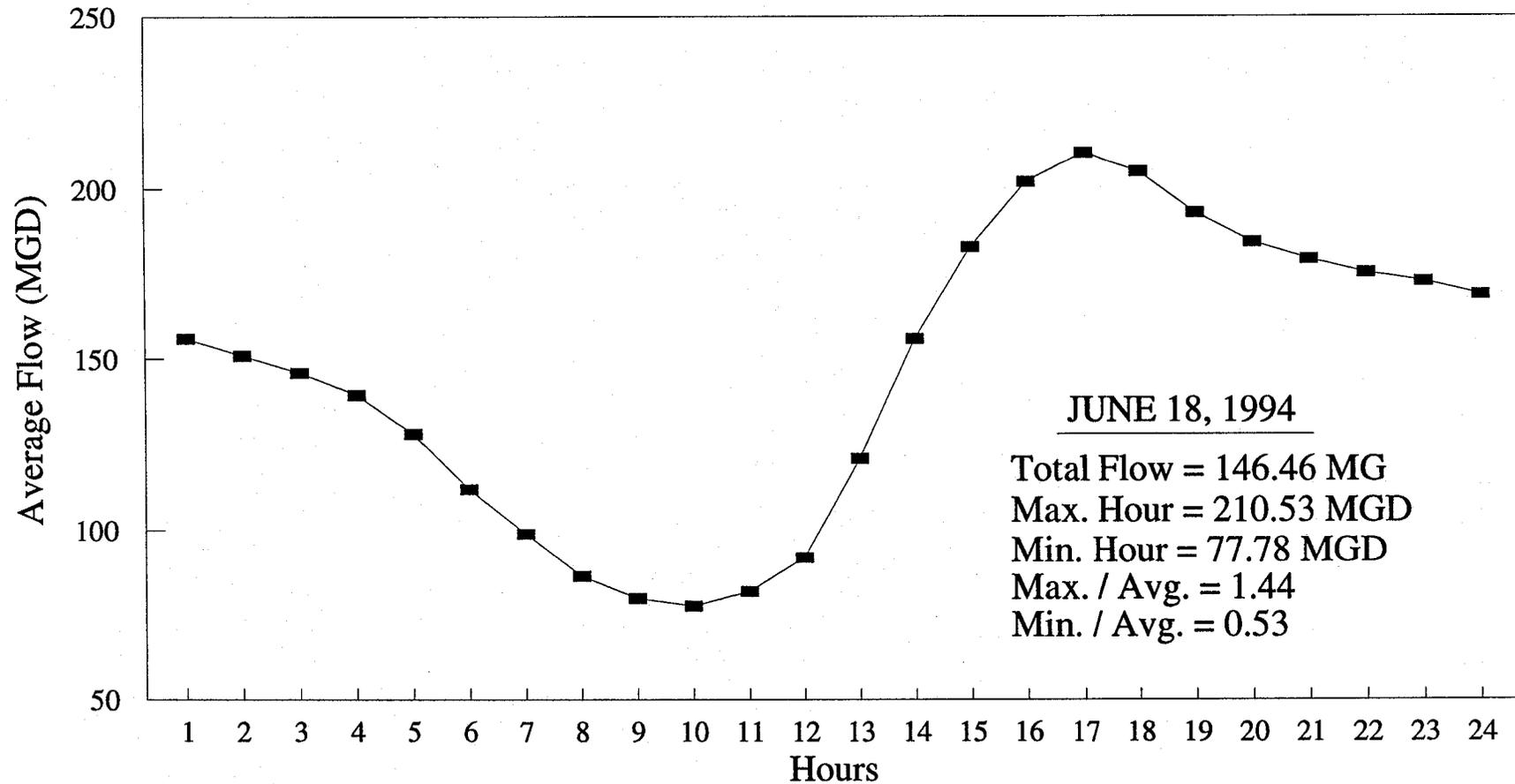
Seasonal fluctuations also dictate the amount of influent to the WWTP. Flow to the plant increases during wet weather seasons due to increased inflow and infiltration of storm water into the system.

The effluent discharged from the Plant depends directly on the influent flow less the demands of the ANPP. The ANPP pipeline diverts effluent from the plant prior to chlorination and disinfection. ANPP demands for effluent are highly variable based upon time of year, cooling requirements of the system and maintenance shutdowns.

The contractual agreement for effluent with the ANPP as well as a contract with the Buckeye Irrigation Company (BIC) account for much of the flow from the WWTP. However, whereas ANPP diverts effluent prior to discharge to the Salt River and, thus, directly affects the volume of effluent discharged from the plant, the BIC diverts effluent after discharge to the existing effluent channel in the Salt River bed.

TYPICAL 24-HOUR INFLUENT FLOW VARIATION

June 18, 1994



Greiner

Figure 2.2

3.0 REGULATORY REQUIREMENTS

3.1 INTRODUCTION

The operation of wastewater treatment, reclamation and storage facilities, the disposal of sludge and the disposal and destination of effluent are governed by numerous federal, state and local regulations and guidelines. The regulations provide the legal and technical framework for wastewater treatment, disposal and reuse to protect public health, natural resources and the environment.

Presented in this section is an overview of the possible federal and state regulations which may impact the 91st Avenue WWTP effluent route.

3.2 REGULATING AGENCIES

Section 208 of the Federal Water Pollution Control Act (FWPCA), as amended by the Clean Water Act (CWA) of 1977, requires state and area-wide planning for the control of water pollution. The Arizona Department of Environmental Quality (ADEQ) has been designated to carry out the State's responsibility in implementation of water pollution control planning in accordance with the FWPCA. The Maricopa Association of Governments (MAG) has been designated as the regional water quality planning agency for all of Maricopa County. The Maricopa County Department of Health Services also regulates wastewater treatment in cooperation with ADEQ. Specific mandates related to the use of groundwater and surface water are overseen by the Arizona Department of Water Resources (ADWR). NPDES permits are issued by the USEPA. Section 404 of the CWA calls for the U.S. Army Corps of Engineers' regulation of discharge of dredged or fill material into U.S. waterways.

3.3 FEDERAL PERMITS AND REGULATIONS

3.3.1 U.S. Army Corps of Engineers-404 Permit

Section 404 of the CWA prohibits the discharge of dredged or fill material into the waters of the United States without a permit from the Corps of Engineers. The City of Phoenix and Greiner, Inc. met informally with the following regulatory agencies regarding the initial steps toward obtaining a U.S. Army Corps of Engineers 404 Permit as outlined by the National Environmental Policy Act (NEPA) guidelines for this study. The U.S. Army Corps of Engineers was designated as the lead agency for this process.

Involved agencies: U.S. Army Corps of Engineers
U.S. Environmental Protection Agency (EPA)
U.S. Fish and Wildlife Service

Arizona Department of Environmental Quality (ADEQ)
Arizona Game and Fish Department
State Historic Preservation Office (SHPO)
Flood Control District of Maricopa County (FCDMC)

The following is a general overview of the steps necessary to obtain a 404 Permit.

Submitting Application for the 404 Permit

An investigative meeting is held to discuss the proposed project and its possible impacts relating to the 404 Permitting process. This investigative meeting leads to the actual application for the 404 Permit. Once the application is submitted, the U.S. Army Corps of Engineers places a 30-day public notice to solicit input from the general public regarding this project.

Environmental Assessment/Environmental Impact Statement

An Environmental Assessment (EA) of the proposed project is conducted to determine the need for an Environmental Impact Statement (EIS). The need for a biological assessment is also determined. The biological assessment is an analysis of the various endangered and threatened species present within the project boundaries and how the project impacts these species. This is required as part of Section 7 of the Endangered Species Act. Additionally, as part of the EIS, an Alternatives Analysis must be completed as outlined by the 404(b)(1) guidelines. This analysis provides alternatives with their impacts and solutions for mitigating the impacts. The impacts related to the relocation of the effluent discharge route would most likely require an EIS.

Review Process for the U.S. Army Corps of Engineers 404 Permit

The information obtained in the EIS and the Alternatives Analysis is presented to the regulatory agencies for review. The agencies' evaluation considers all of the alternatives in terms of avoidance of all environmental impacts, minimization of environmental impacts and mitigation to replace or correct environmental impacts.

Based on the information presented in the EIS and the Alternatives Analysis, the regulating agencies determine if a 404 Permit is to be granted. If no consensus is reached, the application is then referred to the federal level for review and evaluation. This entire process may take from six months to an excess of two years to complete. The study of the impacts associated with relocation of the effluent discharge channel would most likely take nearer the two-year time frame.

The investigative meeting mentioned above at which the City of Phoenix, Greiner, Inc. and the seven regulating agencies attended led to some initial parameters that will be required for securing a U.S. Army Corps of Engineers 404 Permit. Because this project would impact the riparian habitat present in the Salt River along with the wildlife that is supported within this habitat, an EIS with a complete Alternatives Analysis must be performed. Additionally, a detailed biological assessment must be undertaken to determine the impact to endangered and threatened species that are present in the proposed project limits.

3.3.2 USEPA-NPDES Permit

Discharges of treated wastewaters to federally designated waters of the United States are regulated by the United States Environmental Protection Agency (USEPA) through the NPDES permit program. The National Pollution Elimination System (NPDES) permit program establishes the quantity and quality of wastewater which can be discharged to the receiving water. Monitoring requirements are also stipulated in the NPDES permit. Permits are issued for a period of five years. The EPA is the NPDES issuing agency, and in Arizona, the ADEQ coordinates the permit. Regulations which have been adopted by federal and state governments regarding surface water quality and treated wastewater discharge are used as the basis for portions of the NPDES permit.

The final effluent discharge limits for the 91st Avenue WWTP are determined by the NPDES Permit No. AZ0020524, effective from December 29, 1991 through midnight of December 28, 1996.

3.4 STATE PERMITS AND REGULATIONS

The Environmental Quality Act (EQA), passed by the Arizona State Legislature in 1986, provided for the creation of several regulatory programs designed to preserve and protect the surface and groundwater resources in the State. The development of these programs has resulted in the establishment of new guidelines and standards for the disposal of treated wastewater effluent, whether it be discharged to a receiving water, aquifer recharge, reuse for agricultural or landscape irrigation, or a combination of these uses.

3.4.1 State Surface Water Quality Standards (SWQS)

Existing state SWQS identify protected use designations and establish water quality criteria for water bodies throughout Arizona. They include definitions of protected uses, criteria for setting site specific standards, designation of special classes of water (unique and effluent-dominated), numeric standards for each protected use and narrative standards, including toxic, nutrient and anti-degradation provisions which apply to all surface waters. The USEPA uses these state rules to form the basis for portions of the NPDES permits issued for wastewater treatment plants.

The state SWQS are subjected to triennial reviews, as required by the CWA. A review of the standards has been ongoing and has resulted in the issuance of several draft revisions which include major modifications to the rules. The most recent draft revisions issued April 17, 1991, included several provisions which would impact potential treatment plant discharges. Since USEPA must incorporate State SWQS into NPDES permits, proposed revisions to the standards could have a potential direct impact on treatment plant processes and operations.

The Salt River downstream of the 23rd Avenue Wastewater Treatment Plant to the confluence of the Gila River has the SWQS special class water designation of an "Effluent Dominated Stream."

3.4.2 State Aquifer Protection Permit (APP) Program

The 1986 EQA provided for replacement of the former State Groundwater Quality Protection Program with the APP program. Most discharges to groundwater in Arizona, including all wastewater facilities, are required to apply for and obtain an APP. APP requirements include achievement of State Aquifer Water Quality Standards at a designated point of compliance and implementation of Best Available Demonstrated Control Technology (BADCT) in the treatment process to achieve the necessary water quality. Currently promulgated Aquifer Water Quality Standards generally correspond to Federal Drinking Water Maximum Contaminant Levels (MCLs). BADCT determination will vary between new facilities and existing facilities; will be applied on a plant-specific basis with considerations to toxicity, cost/benefit analyses and facility age/existing processes; and may be dependent on the end uses applied to the effluent.

The guidelines for implementation of BADCT are not final, but it is anticipated at this time that nitrogen removal will be required in order to meet the Aquifer Water Quality Standard for nitrates (10 mg/L NO₃-N). ADEQ is currently using APP permits with total nitrogen limitations of 10 mg/L, and alert levels of 6 mg/L for plants with capacity of 100,000 gpd or more. In addition, alternative disinfection methods of chlorination (regardless of whether dechlorination is also employed) may be required in order to reduce the potential for the formation of trihalomethanes and other disinfection by-products. State APP and Federal NPDES permit reviews will be coordinated by ADEQ for those facilities which discharge to both surface water and groundwater.

An APP is required for any new or upgrading of wastewater treatment plants. The effluent discharge location may also require a separate APP unless located within the same or adjacent geographic area as the wastewater facility. The City of Phoenix has applied for an APP permit for the 91st Avenue WWTP related to the NdeN conversion project at the facility.

3.4.3 State Wastewater Reuse Regulations

The ADEQ is currently responsible for developing and enforcing regulatory requirements for the reuse of wastewater in the state. Wastewater reuse permits specify the quantity and quality of effluent to be used for specific purposes. State regulations currently specify minimum water quality criteria for individual reuse classifications falling within the general categories of agricultural irrigation (orchards, fiber, seed and forage; pastures; processed food; food consumed raw), livestock watering, landscape irrigation and human contact. These water quality criteria are currently limited to numeric standards for pH, fecal coliform, bacteria, turbidity, enteric virus and several other pathogenic organisms. Reuse permits are issued by ADEQ for a period of five years.

3.4.4 State Water Quality Certification--Section 401

Section 401 of the CWA requires state water quality certification for projects which require a federal permit and which discharge to waters and/or wetlands of the state. In the State of Arizona, the most common actions which require a Section 401 permit are Section 404 dredge and fill permits and Section 402 permits. The ADEQ is the agency responsible for the issuing of Section 401 permits for federally regulated projects.

The application procedure consists of completion of necessary forms for certification with the ADEQ. Following review of the application information, the ADEQ will grant a letter of certification for projects which qualify.

3.5 MISCELLANEOUS PERMITS

Additional regulatory agencies have certain jurisdictions which may regulate the final effluent alignment.

Any project within flow channels regulated by the FCDMC is required to obtain a floodplain use permit from the Flood Control District.

The realignment of the effluent channel across Bureau of Land Management (BLM) or Arizona State land may require special permits. If the effluent traverses through BLM land, a "right-of-way" permit may be required as outlined by Section 2800 of the Code of Federal Regulations (CFR). If the effluent travels across land designated as Arizona State land, a similar permit may be required by the state.

4.0 DESIGN GUIDELINES

4.1 CHANNEL ALIGNMENT

The study evaluated several alternatives for relocating the effluent channel in attempt to improve the quality of life in the surrounding area. The potential alternatives include maintaining the existing discharge route (Figure 4.1), as well as redirecting the flow to either a central route or a southern route. Additionally, each of the redirected flow alternatives can either be split flow as it is discharged from the 91st Avenue WWTP by separating Plant 1 and Plant 2 flow from Plant 3A flow, or combined flow from all three plants by utilizing the existing Combined Plant Outfall Channel. The proposed effluent channel alignments are presented in Figures 4.2-4.5. The realignment in each case is considered from 91st Avenue to 115th Avenue. Realignment west of 115th Avenue is not considered in this study since the existing effluent channel follows a more central path in the river bed.

The proposed centrally located effluent channel is located within the FCDMC's 1,000-foot clear area right-of-way. The FCD maintains this area free of vegetation to increase the conveyance capacity of the river channel. The alignment flows southwest of 91st Avenue to the approximate Gila River Indian Reservation boundary and follows this boundary to 115th Avenue.

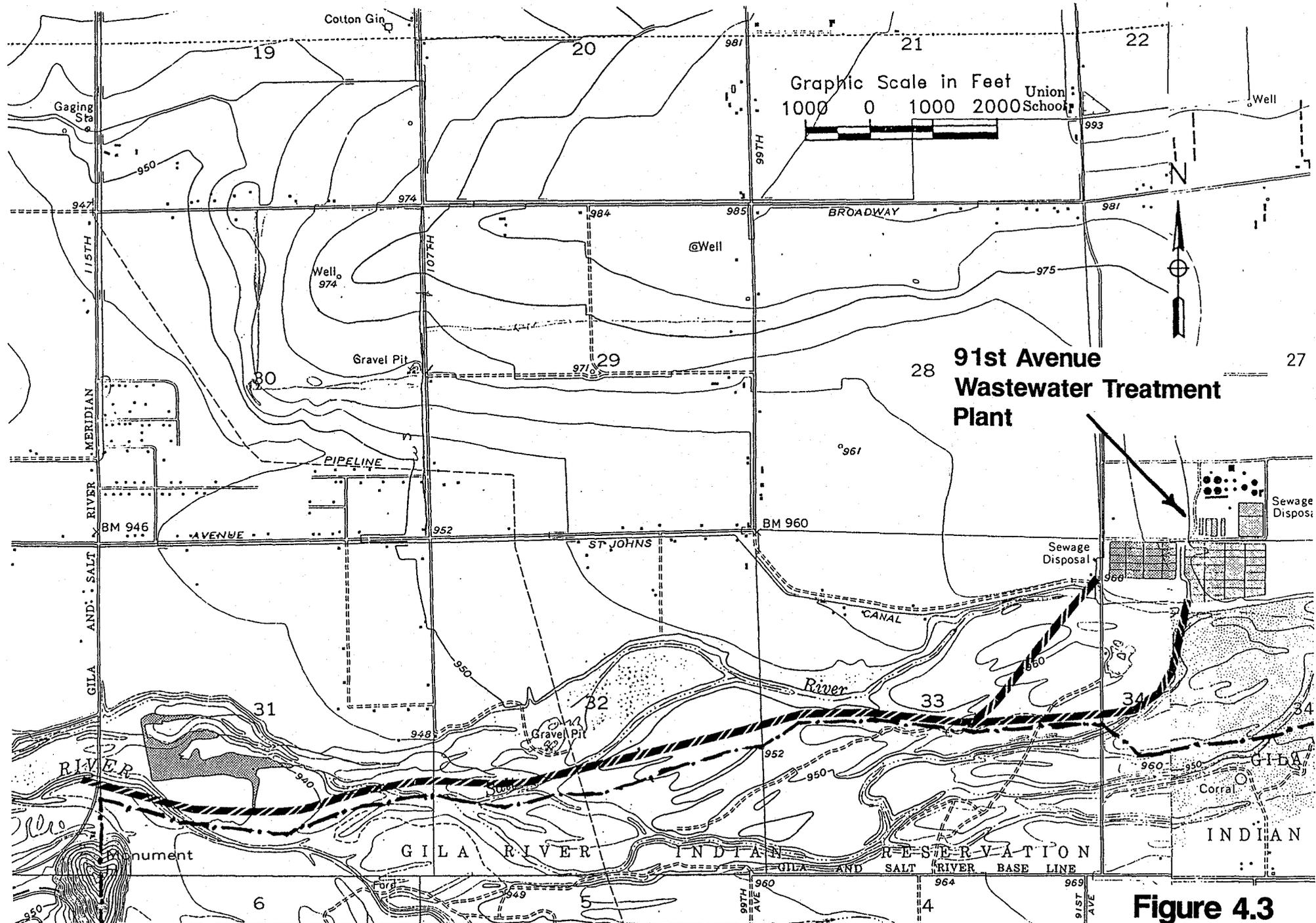
The proposed southern channel alternative returns the effluent to its approximate historical location. The channel flows south through Indian land and then west along the southern edge of the Salt River until 115th Avenue where it returns to the existing effluent channel alignment.

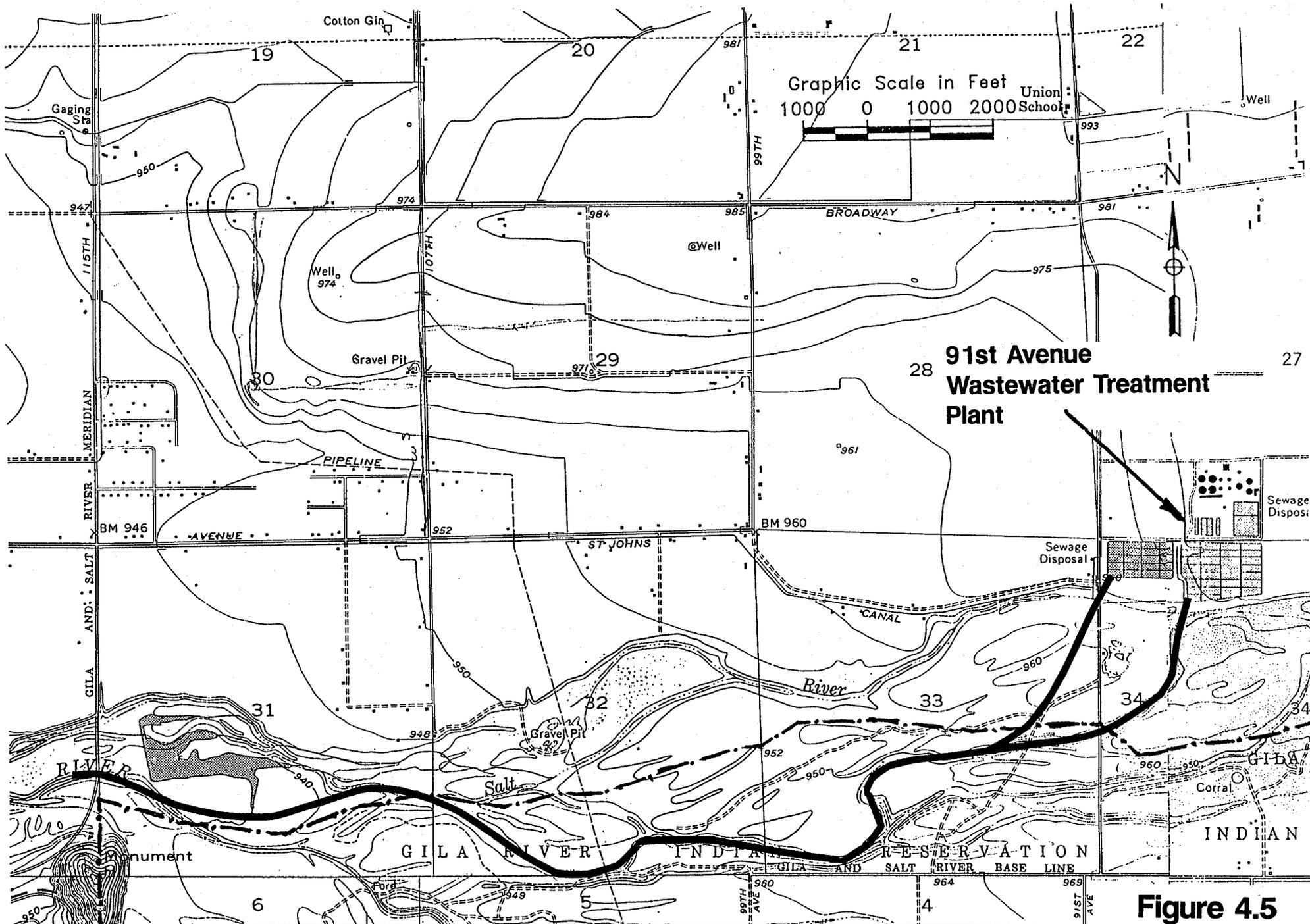
4.2 CHANNEL ALTERNATIVES

The channel cross-sections considered are a trapezoidal shape. The proposed bottom width is 20 feet with an overall top width of 41 feet. The proposed channel side slopes are three units horizontal to one unit vertical. Figure 4.6 shows a typical proposed channel cross-section.

4.2.1. Flow Rates and Channel Velocity

The maximum effluent discharge to the Salt River from January 1992 through July 1994 was used for channel flow rate calculations. This rate has been recorded as 132 mgd or approximately 204 cfs. Based upon this flow rate and varying bottom widths, channel velocities of the proposed realignments were calculated for channel widths varying from 20 feet to 40 feet. The analysis was performed using Manning's equation with a 3:1 side slope and Mannings "n" equal to 0.03. This Manning's "n" value was determined upon review of the Simons, Li & Associates (SLA) Flood Mitigation Study (2). The SLA study HEC-2 analysis used roughness coefficients of 0.033 and 0.045 for the Salt River for the main channel and overbanks respectively. These values coincide with U.S.



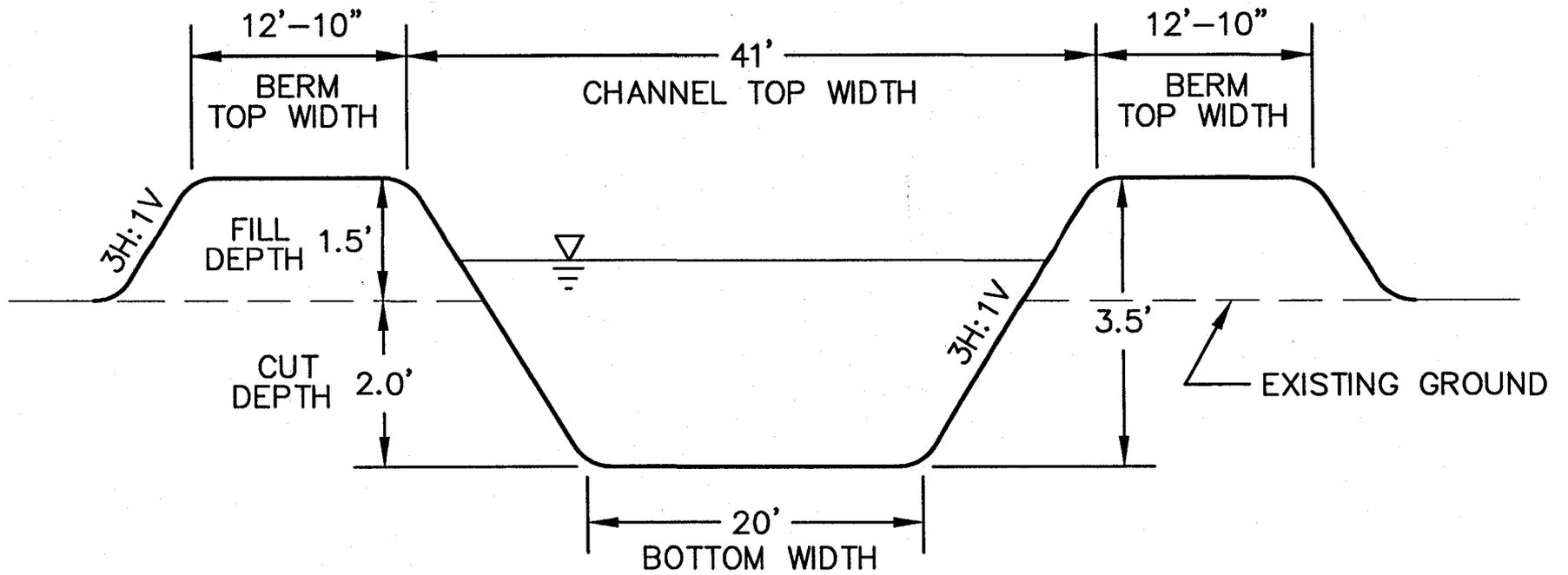


**91st Avenue
Wastewater Treatment
Plant**

Discharge Route Alternatives

Split Effluent Flow : Routed to
Southern Channel

**Figure 4.5
Greiner**



TYPICAL CHANNEL CROSS-SECTION

SCALE: HORIZ: 1"=10'
 VERT: 1"=2'

Army Corps of Engineers 1983-84 Flood Insurance Study values. However, the SLA report also referenced a Corps study which estimated that the FCDMC's clearing project would reduce the roughness coefficient in the Salt River main channel to 0.03. The following table shows the effect of varying channel dimensions on velocity.

Table 4.1 Channel Velocity Calculations

	Bottom Width (ft)	Water Surface Top Width (ft)	Velocity (fps)	Depth of Water (ft)
Southern Channel	20	36.4	2.7	2.7
	25	39.8	2.6	2.5
	30	43.4	2.4	2.2
	40	51.5	2.3	1.9
1,000-Foot Clear Channel	20	34.8	3.0	2.5
	25	38.8	2.9	2.2
	30	42.1	2.8	2.0
	40	50.3	2.6	1.7

"Q" used for calculations was based on maximum effluent discharge to the Salt River from January 1992 through July 1994.

$$Q=204 \text{ cfs}(=132 \text{ mgd})$$

4.2.2. Channel Stability and Efficiency

The SLA (2) report refers to the historical shifting of low flow channels and the braiding patterns present in the Salt River bed. The Salt River is described as a braided channel with low flow conditions. The channels are generally wide and consist of two or more main channels that cross one another. The braiding of the river bed is due to random deposition of materials during flooding or high flows. The braiding also results in constantly varying low flow channels. Braided channels are usually indicative of sediment transport. This occurs at flood conditions. Flood velocities can reach high enough levels to move large volumes of sediment. This sediment begins to settle when the flow reaches an area where the velocities decrease. The larger particles begin to settle, creating islands and, thus, the braiding patterns that are typical within the Salt River.

Based upon the anticipated effluent velocities in the channel, an unlined earthen channel will be sufficient. Also, given the dynamic nature of the river bed due to frequent flooding and the

historical shifting of low flow channels, a lined channel would be impractical because any channel in the river bed will not be permanent. The 20-foot bottom widths will create a higher velocity than the wider bottom widths and are the considered channel cross-sections for this study to deliver the effluent to the Agua Fria River in the most timely manner and to prevent stagnant water.

Slightly meandering channel alignments are considered as opposed to straight channel alignments. The meandering channels are more desirable to the regulatory agencies as they create a better environment for vegetation and wildlife. Also, decreased velocities associated with meandering channels will reduce scour and create a more stable channel cross-section.

4.3 IMPACT ASSESSMENT AND MITIGATION

4.3.1 Agency Input

As a part of this study, input was solicited from various regulatory agencies regarding potential impacts and effects associated with rechannelization of the effluent discharge route. Input from these organizations is important due to the complex factors associated with this type of project. The purpose for interaction with the various agencies that have jurisdiction in these areas was to minimize problems that may arise as a result of this project.

The following agencies were contacted for letters of input regarding the impacts of the proposed effluent realignment:

Bureau of Reclamation
Buckeye Irrigation Company
U.S. Army Corps of Engineers
U.S. Fish and Wildlife
Arizona Department of Environmental Quality
Flood Control District of Maricopa County
Arizona Game and Fish Department
U.S. Environmental Agency, Region IX

The letters received from these agencies are attached as **Appendix B**. The Bureau of Reclamation chose not to formally submit a letter of comment on the study at this time.

To summarize, the initial response of Buckeye Irrigation Company and the Buckeye Water Conservation & Drainage District (District) was that the District has no objection to the proposed channel alignments "as long as surface water is not diverted, withdrawn or otherwise reduced of flow". The District furthermore commented on the need for the development of a plan and cost estimate for the maintenance of the channel with the southern realignment alternative. If a

maintenance plan is not proposed, the District recommends merging the project with the proposed Tres Rios pilot program. In closing, the District expressed their desire to "cooperate with all concerned to create a more productive and less offensive river segment" and reiterated their opposition to "any attempt to take water out of the river at any point between the 91st Avenue plant and (the Buckeye Irrigation) diversion."

The U.S. Army Corps of Engineers (Corps) outlined regulations of Section 404 of the Clean Water Act. A site visit was conducted by members of the Arizona Field Office of the Los Angeles District at which time it was determined that the proposed effluent alignments are within waters of the U.S., including wetlands. Therefore, a Section 404 Permit will be required for the proposed realignments. Also, in the event of realignment, the office should be contacted to perform a formal wetlands delineation prior to permit application submittal. In addition, the wetlands established by the Tres Rios Constructed Wetlands Research and Demonstration Project, Cobble site and remaining as a result are also considered jurisdictional under Section 404. The Bureau of Reclamation and the City of Phoenix have applied for a Section 404 Permit for the Tres Rios Cobble Site. Additionally, although the Corps has no jurisdiction over non-wetlands riparian areas, "preservation of these habitats are highly recommended". Projects requiring an individual Section 404 also must define an "established need and purpose for the project" in accordance with the Alternative Analysis presented in 40 CFR 230, 404(b)(1) guidelines. The Corps also identified concern of the channel realignment offering only a temporary resolution. Furthermore, the Corps expressed the counterproductive nature of the realignment considering that the changing nature of the channel due to the frequency of high flows may not guarantee the alleviation of flooding to downstream areas.

The letter of input received from the U.S. Department of the Interior, Fish & Wildlife Service outlined concern of the protection of existing wetlands and riparian habitats supported by the present effluent channel alignment. The Fish & Wildlife Service stated that the current habitats support a large variety of wildlife species including federally listed or proposed threatened or endangered species. Also noted was that the mitigation of the valuable wetlands and riparian habitat lost by channel realignment "would be costly and its success questionable". The recommendations made by the Fish & Wildlife Service are that the effluent channel be maintained at its present location. If it is determined necessary that the channel be relocated, a wetlands mitigation plan with a replacement of at least a 2 to 1 ratio must be prepared and approved by the Arizona Game and Fish Department and the U.S. Fish and Wildlife Service.

The ADEQ responded that any channelization will be temporary due to the frequent flooding of the Salt and Gila Rivers and that there would be a need for an individual Section 404 Permit for the effluent channel realignment. The summarizing comment expressed by the ADEQ was that the Department does not "see any reason at this time to create an artificial channel for this flow when the present channel is adequate".

The FCDMC in their letter of input stated that "the District would give slight preference to either of the two (alternatives) referred to as 'routed to central channel'." The FCDMC also expressed concurrence with other regulatory agencies that the need to reroute the effluent channel is questionable and, therefore, doubted the approval of the Section 404 Permit by the appropriate agencies. The District also noted that in the event that the channel is rerouted, Mr. Richard J. McNamara, Property Acquisition Manager, shall be contacted regarding uses within the 1,000-foot corridor right-of-way.

Input from the Arizona Game & Fish Department (Department) outlined two major concerns: impacts to wildlife habitats along the Salt and Gila Rivers and impacts to land managed by the Department. The letter from the Department elaborates on these concerns, noting the high quality of the existing riparian habitats and that the design of the new channel will have a strong influence on the "abundance and quality of habitat that returns." The Department also indicated that the area of the proposed realignment is qualified as Resource Category I, classifying the habitats in this area as "of the highest value to Arizona wildlife species, and unique and/or irreplaceable on a statewide or ecoregion basis." The Department will seek no net loss of the value of the existing habitat. In addition, the Department lists species of concern found in this area which are either listed endangered, state threatened or classified as "sensitive." The Department also notes concern of impact on parcels it manages in the area, specifically those managed as the Base and Meridian Wildlife Area. The City of Phoenix would be required to obtain right-of-way from the Department to enter and construct on these properties. In addition, the need for a Section 404 Permit and compliance with the National Environmental Policy Act (NEPA) process was indicated. The Department also recommended that the needs of the Holly Acre residents be addressed in the additional planning studies which are concurrently being performed. In closing, the Department stated its position of supporting no change in the alignment of the effluent channel at this time.

The U.S. Environmental Protection Agency (EPA) commented that the consideration of realignment may be premature due to the constructed wetlands project in the area over the next few years. The EPA also noted that a major concern with the proposed realignment is the effect on the existing riparian habitats and that other alternatives should be considered to avoid or minimize this impact. Finally, the requirement of a Section 404 Permit was indicated along with the need to demonstrate minimal impacts to wetlands and to provide compensation through mitigation for wetlands which unavoidably would be impacted by the realignment.

To summarize, points of major concern expressed by the agencies' responses appear to be the Section 404 Permit, the impacts to valuable riparian and wetlands habitats, the effects of the realignment on the Tres Rios constructed wetlands pilot study, and demonstration of purpose and need for acceptance of the realignment of the effluent. **Figure 4.7** presents a Matrix of Agencies' Comments, summarizing these points as well as input from the project committee.

Figure 4.7 Matrix of Agencies' Comments

Agency	Preferred Effluent Route	Section 404 Permit	Compensation / Mitigation	Establish Project Need & Purpose	Riparian / Wildlife Habitats	Tres Rios / Other Studies	Temporary Solution to Problem
Buckeye Irrigation Company	NI	NI	NI	NI	NI	Perhaps merge channel with constructed wetlands	NI
U.S. Army Corps of Engineers	NI	Required; least environmentally damaging alternative	NI	Must establish need and purpose	High resource wildlife	Proposed realignments cross Tres Rios	Temporary due to frequent high flows and changing channels
U.S. Fish & Wildlife Service	Maintained at present location	NI	Yes; at least 2:1; costly and success questionable	NI	Valuable; federally listed & endangered exist	NI	NI
AZ Department of Environmental Quality	See no reason to create artificial channel	Required	NI	Justification or specific statement of purpose required	NI	NI	Any channelization temporary due to frequent floods
Flood Control District of Maricopa County	Slight preference to central channel (if channel moved from existing location)	Required	NI	Questions need and doubts Section 404 approval for purpose	NI	NI	NI
AZ Game & Fish Department	Supports no change in current alignment	Required; compliance with NEPA process	Yes; no net loss of habitat value	NEPA process: purpose and need for project	Highest value; unique and/or irreplaceable	Suggest needs of residents be incorporated into concurrent planning studies	NI
U.S. Environmental Protection Agency	NI	Required; avoid impacts to wetlands where possible	Yes; compensation for unavoidable impacts	NI	Impacts on existing riparian habitats	Realignment may be premature considering constructed wetlands pilot study	NI
Committee Input			Consider 2:1 mitigation for both existing channel and proposed realignment	If suitable means for protecting the citizens' interests and needs cannot be achieved, City of Phoenix may be forced to remove all effluent from the river (Zero Discharge)			Nature of project intended to be a short term solution until long term solution is investigated and funded

NI = Not Indicated

4.3.2 Public Input

Throughout the duration of the project, four public meetings were held to provide the public with the opportunity to learn about and discuss the Effluent Discharge Route Study. The public meetings also provided the public with a forum in which to express their thoughts and concerns about the project. Comment and questionnaire forms were available at all meetings for the public to express their concerns, questions and comment on their personal views. A summary of responses received from each meeting is attached as **Appendix C**.

The first public meeting was held on Monday, August 15, 1994, from 5:00 p.m. to 8:00 p.m. at the 91st Avenue WWTP Administration Building Conference Room. The format of this meeting was an open house. Issues addressed included a description of the study and how and why the study evolved, overview of the operation of the 91st Avenue WWTP, and public, regulatory and plant operations impacts as the result of effluent channel relocation. A total of 17 people attended, including representatives of the City of Phoenix and Greiner, Inc.

Public Meeting #2 took place on Tuesday, October 11, 1994, at 7:00 p.m. at the 91st Avenue WWTP. The meeting format was a presentation. Topics of discussion included a description of the related 91st Avenue WWTP projects, discussion of the proposed channel alternatives and the associated effects of floods, groundwater effects and regulatory impacts. The meeting was attended by a total of 16 people.

Public Meeting #3 was held on Thursday, November 17, 1994, at 7:00 p.m. This meeting was also a presentation format. The primary focus of this meeting was a discussion of the regulatory impacts associated with the rechannelization of the effluent. Also at this meeting, property ownerships from 83rd Avenue to the Agua Fria River and the U.S. Army Corps of Engineers permitting jurisdiction were described. This public meeting was attended by 13 individuals.

The final Public Meeting #4 was held at the 91st Avenue WWTP on Thursday, March 16, 1995 at 7:00p.m. This meeting was attended by 14 individuals. The presentation consisted of a summary of the project history including highlights of the previous public meetings as well as a discussion of the findings and conclusions resulting from the study. At this meeting, citizens were also able to make requests to receive copies of the final Conceptual Report for the study.

4.3.3 Impacts to Groundwater

Information gathered from the Arizona Department of Water Resources with respect to the groundwater levels around the 91st Avenue Wastewater Treatment Plant show an increasing trend. This increasing trend may be due to several factors. Decreased groundwater pumping in the area may be due to increased development in the area and, therefore, decreased agricultural usage. Also, the use of effluent water for irrigation may be replacing previously pumped

groundwater. The continual presence of effluent in the river bed recharges the groundwater table. Flood deposition of sediments with higher infiltration rates may also contribute to the rising groundwater table.

Typically, groundwater tends to mound beneath surface water. Therefore, moving the effluent channel from its current alignment will likely cause the groundwater mound to shift. The decrease of the groundwater locally at the existing channel if the alignment is moved will impact the existing vegetation. The movement of the groundwater mound to the proposed alignment will encourage local vegetation establishment.

4.3.4 Impacts to Riparian Vegetation

The riparian vegetation along the Salt and Gila Rivers has been mapped by the FCDMC based upon data from the Arizona Game and Fish Department. The four vegetation communities that were identified in the floodplain areas are Tamarisk, Cottonwood/Willow, Mesquite and Strand vegetation types. The area confined to 91st Avenue and 115th Avenue has been designated as an area which has not been ground verified. However, by extrapolating the vegetation which occurs immediately downstream of 115th Avenue, the area between 91st Avenue and 115th Avenue can be described as consisting of primarily Tamarisk and Strand communities.

Realignment of the existing effluent channel will have an effect on the riparian vegetation supported by the effluent stream. If the existing channel is allowed to dry up without supplemental watering to maintain the in-place habitats, it is questionable which vegetation if any would survive in that area. Also, realignment of the channel will require wetlands mitigation for the existing channel as well as the proposed channel.

The success of mitigation of the existing wetlands vegetation will be dependent on several factors. The speed with which the vegetation returns is directly related to water and soil nutrients. More stringent treatment processes resulting in decreased nitrogen in the effluent may have an affect on the wetlands vegetation. Also, if mitigated wetlands receive water from a source other than nutrient rich effluent, the vegetation which reestablishes may be of a different quality and value than the existing in kind vegetation.

Vegetation replacement should be aimed at repeating the existing plant density. The existing density can be determined by counting the number of trees and plants in an area representative of the entire existing wetlands. The density calculated in this area can then be extrapolated to cover the entire area. However, the density of the replanting should be adjusted to reflect the estimated survival rate of the replaced vegetation. Plant survival can be somewhat ensured by growing first in a nursery or other harvest location and transplanted to the mitigation area in the winter when the plants are dormant. Vegetation planted in the river bed will be susceptible to floods and it will be necessary to replant those destroyed by flooding.

4.3.5 Impacts to Endangered and Threatened Species

The U.S. Fish and Wildlife Service and the Arizona Department of Game and Fish have indicated that the existing riparian habitat along the effluent channel supports several federally listed or endangered species and realignment of the effluent channel will likely adversely impact the wildlife population until the habitat is reestablished along the proposed channel alignment. Some of the species of concern that have been documented in the project area are the Yuma clapper rail, bald eagle, peregrine falcon, brown pelican, Southwestern willow flycatcher, and the yellow-billed cuckoo. These agencies have recognized the importance of the protection of these species and will require that no negative impact occurs to them as a result of the project.

4.4 CONSTRAINTS

There exist several factors which limit the possible effluent channel realignments. Properties along the north and south borders of the Salt River limit realignment locations. Neighboring residents north of the Salt River would like the effluent channel moved as far south from their properties as possible. The Gila River Indian Reservation bordering the Salt River to the south limits possible southern realignments. Additionally, the City of Phoenix has two contractual agreements for the reuse of effluent from the 91st Avenue WWTP. The realignment must not prevent the fulfillment of effluent diversion for these two purposes.

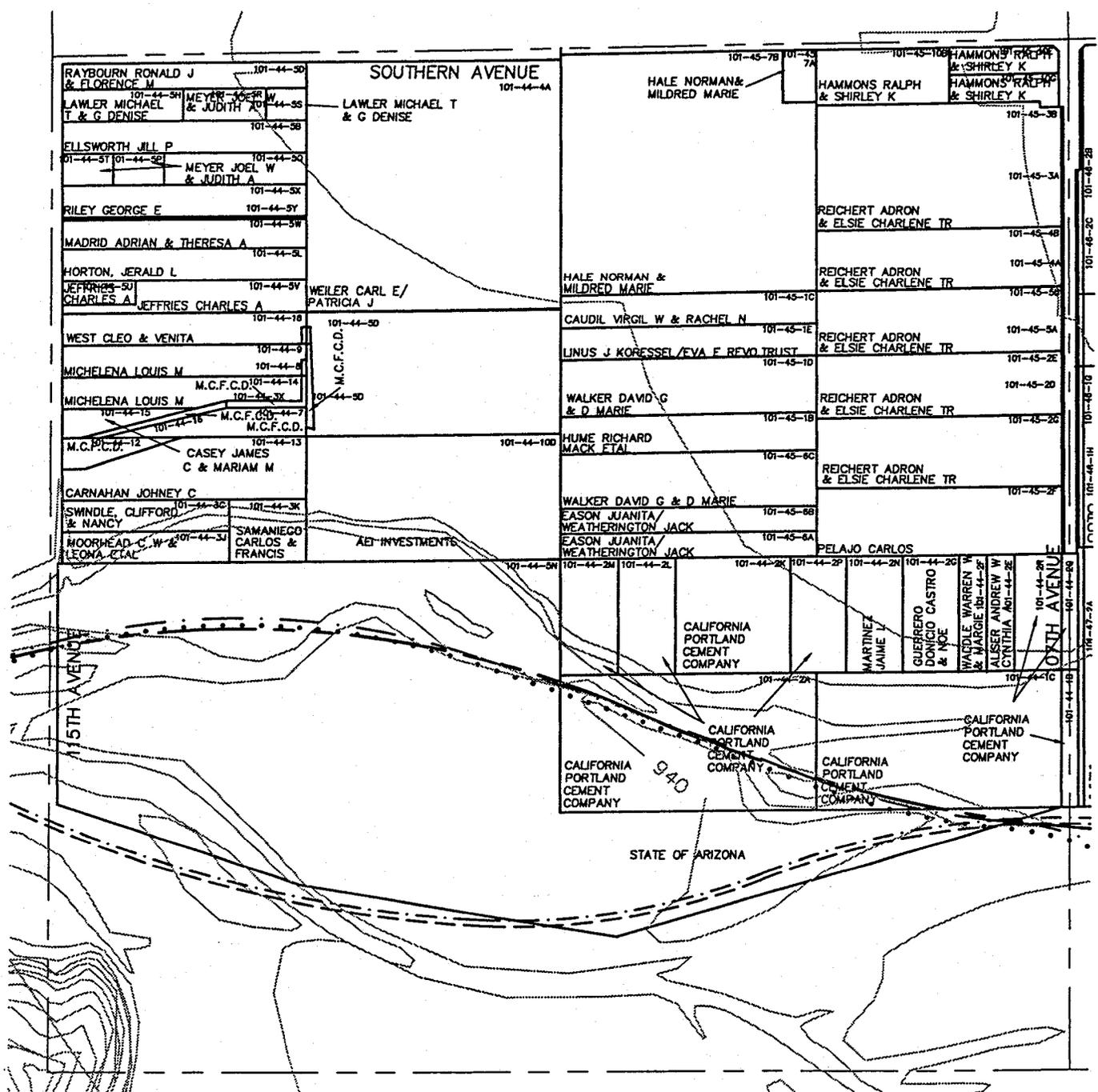
4.4.1. Surrounding Community

The 91st Avenue WWTP is located in Tolleson, Arizona. Land uses in Tolleson consist primarily of agricultural, low-density industrial and residential development. Long-established residential communities neighbor the treatment plant as well as single dwellings. Mining has also historically occurred in locations upstream and downstream of the WWTP. Figures 4.8–4.11 delineate the property boundaries and ownerships of the land parcels in the immediate vicinity of the 91st Avenue WWTP and the study area. The Gila River Indian Reservation land is located to the south of the study area along the Salt River.

Residents of the Holly Acres subdivision located along the northern edge of the Salt River between 91st Avenue and 115th Avenue have experienced flooding of their properties

91ST AVENUE WASTEWATER TREATMENT PLANT

- EXISTING CHANNEL -----
- COMBINED EFFLUENT FLOW WITHIN 1000' CLEAR AREA - - - - -
- SPLIT EFFLUENT FLOW RETURNED TO SOUTHERN CHANNEL
- SPLIT EFFLUENT FLOW WITHIN 1000' CLEAR AREA - - - - -
- COMBINED EFFLUENT RETURNED TO SOUTHERN CHANNEL -

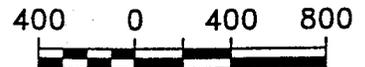


SECTION NO.

31



Graphic Scale in Feet



91ST AVENUE WASTEWATER TREATMENT PLANT

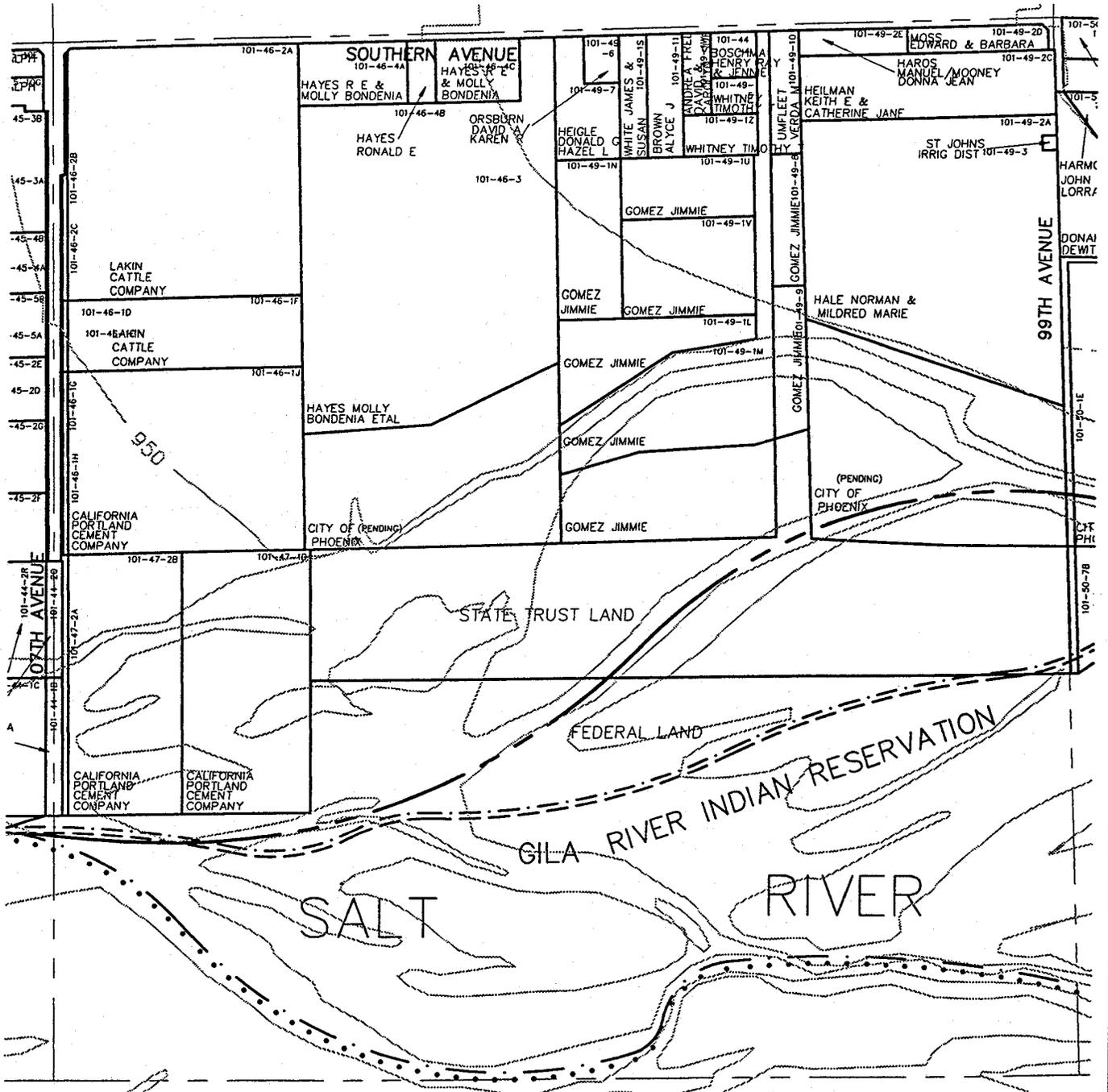
EXISTING CHANNEL _____

COMBINED EFFLUENT FLOW WITHIN 1000' CLEAR AREA - - - - -

SPLIT EFFLUENT FLOW RETURNED TO SOUTHERN CHANNEL

SPLIT EFFLUENT FLOW WITHIN 1000' CLEAR AREA - - - - -

COMBINED EFFLUENT RETURNED TO SOUTHERN CHANNEL - . - . - .



SECTION NO.

32



Graphic Scale in Feet



91ST AVENUE WASTEWATER TREATMENT PLANT

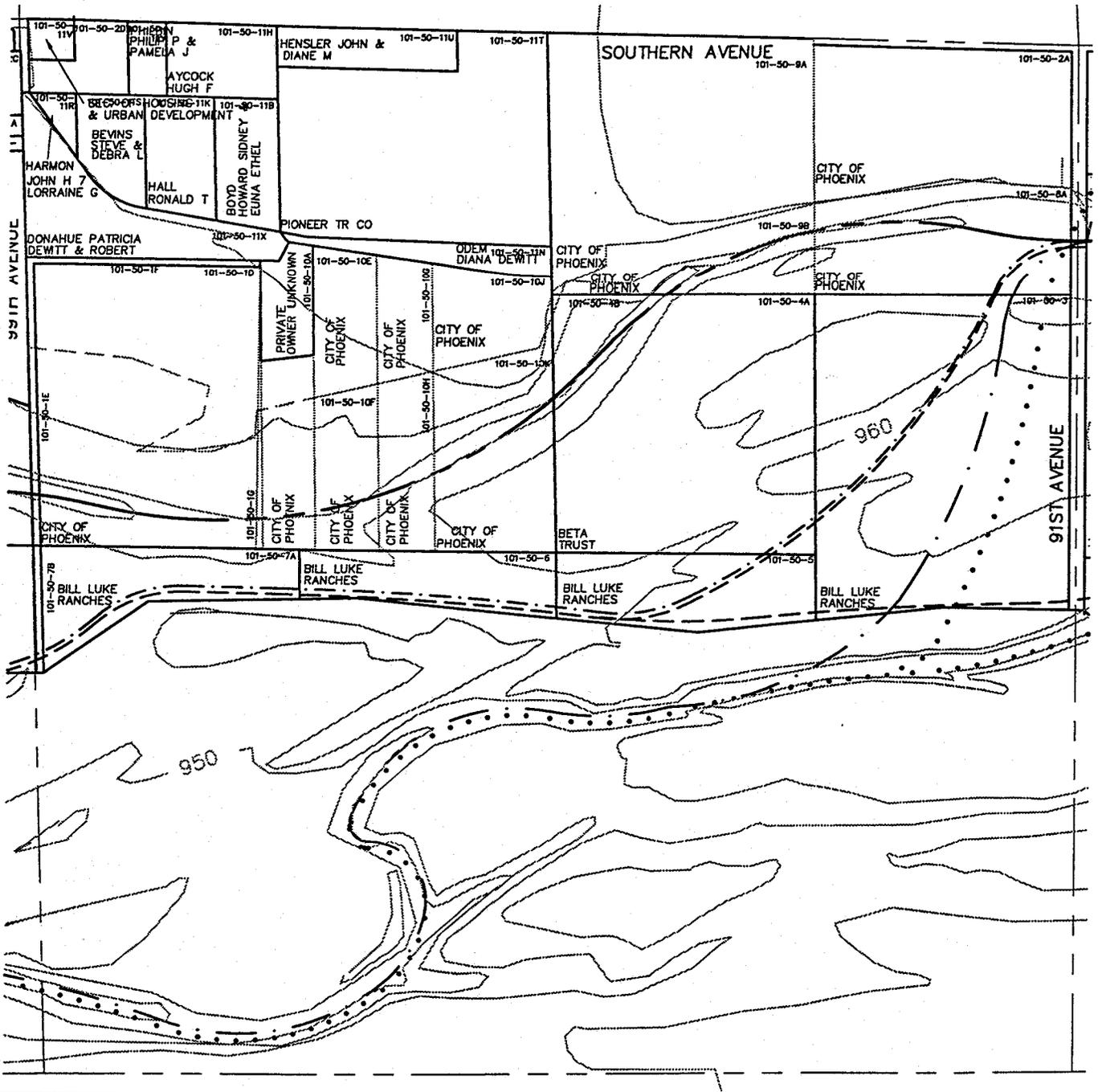
EXISTING CHANNEL

COMBINED EFFLUENT FLOW WITHIN 1000' CLEAR AREA

SPLIT EFFLUENT FLOW RETURNED TO SOUTHERN CHANNEL

SPLIT EFFLUENT FLOW WITHIN 1000' CLEAR AREA

COMBINED EFFLUENT RETURNED TO SOUTHERN CHANNEL



SECTION NO.

33



Graphic Scale in Feet



91ST AVENUE WASTEWATER TREATMENT PLANT

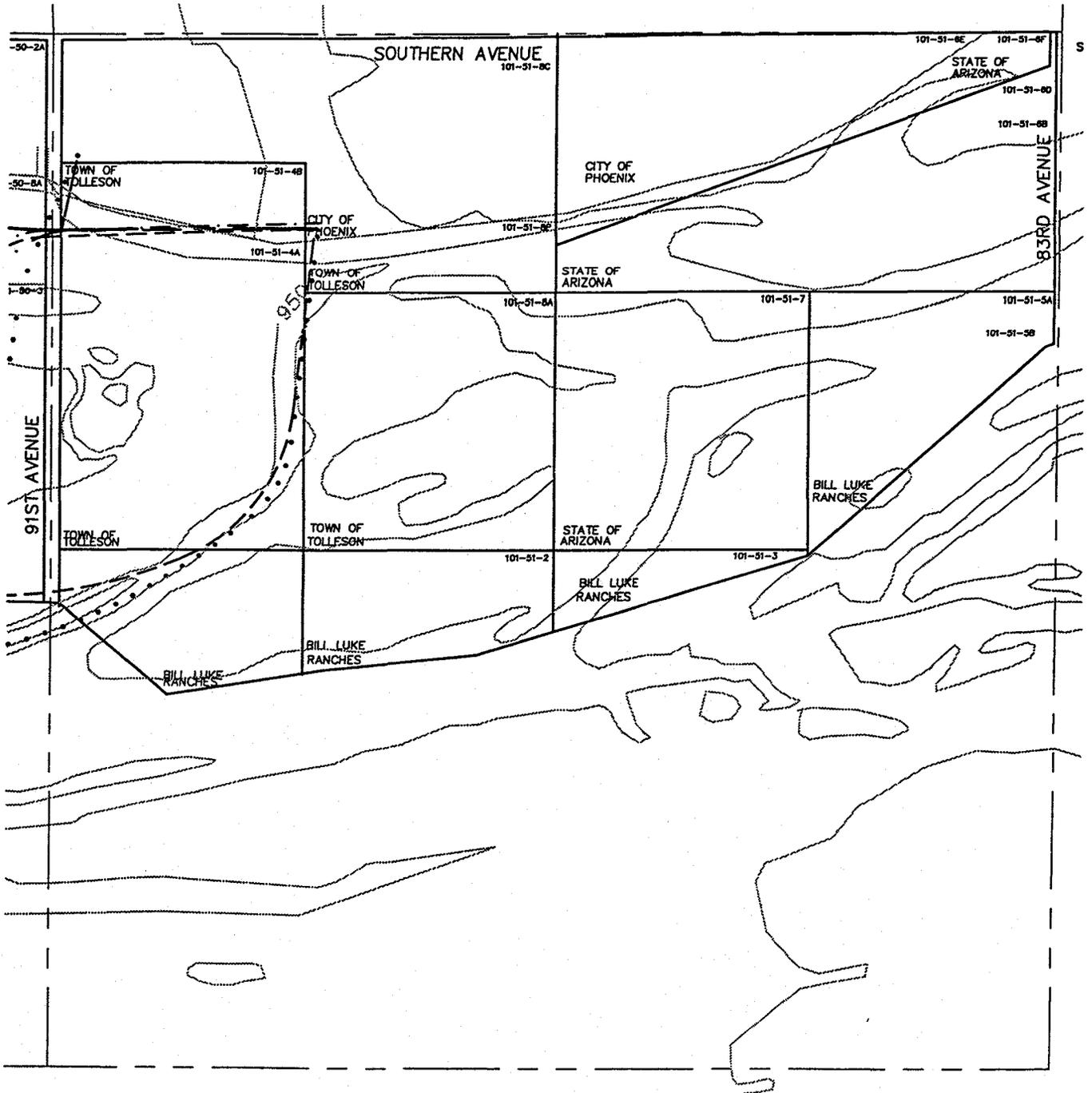
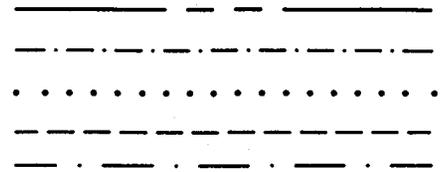
EXISTING CHANNEL

COMBINED EFFLUENT FLOW WITHIN 1000' CLEAR AREA

SPLIT EFFLUENT FLOW RETURNED TO SOUTHERN CHANNEL

SPLIT EFFLUENT FLOW WITHIN 1000' CLEAR AREA

COMBINED EFFLUENT RETURNED TO SOUTHERN CHANNEL

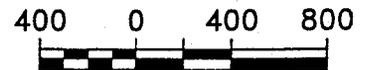


SECTION NO.

34



Graphic Scale in Feet



during incidences of high flows in the Salt River. The residents believe that the presence of the effluent channel in the river has lowered their property value and quality of life due to odors and insects which result from areas of ponding and stagnant water. The residents have also indicated that when the effluent channel was located in its historical southern alignment, the Salt River was free of vegetation. However, the current northern alignment has supported the continued growth of riparian vegetation and habitat in the river bed. The residents feel that the vegetation present today has contributed to the flooding of their properties. Therefore, the existing northern effluent alignment is not desirable to the residents of the surrounding community.

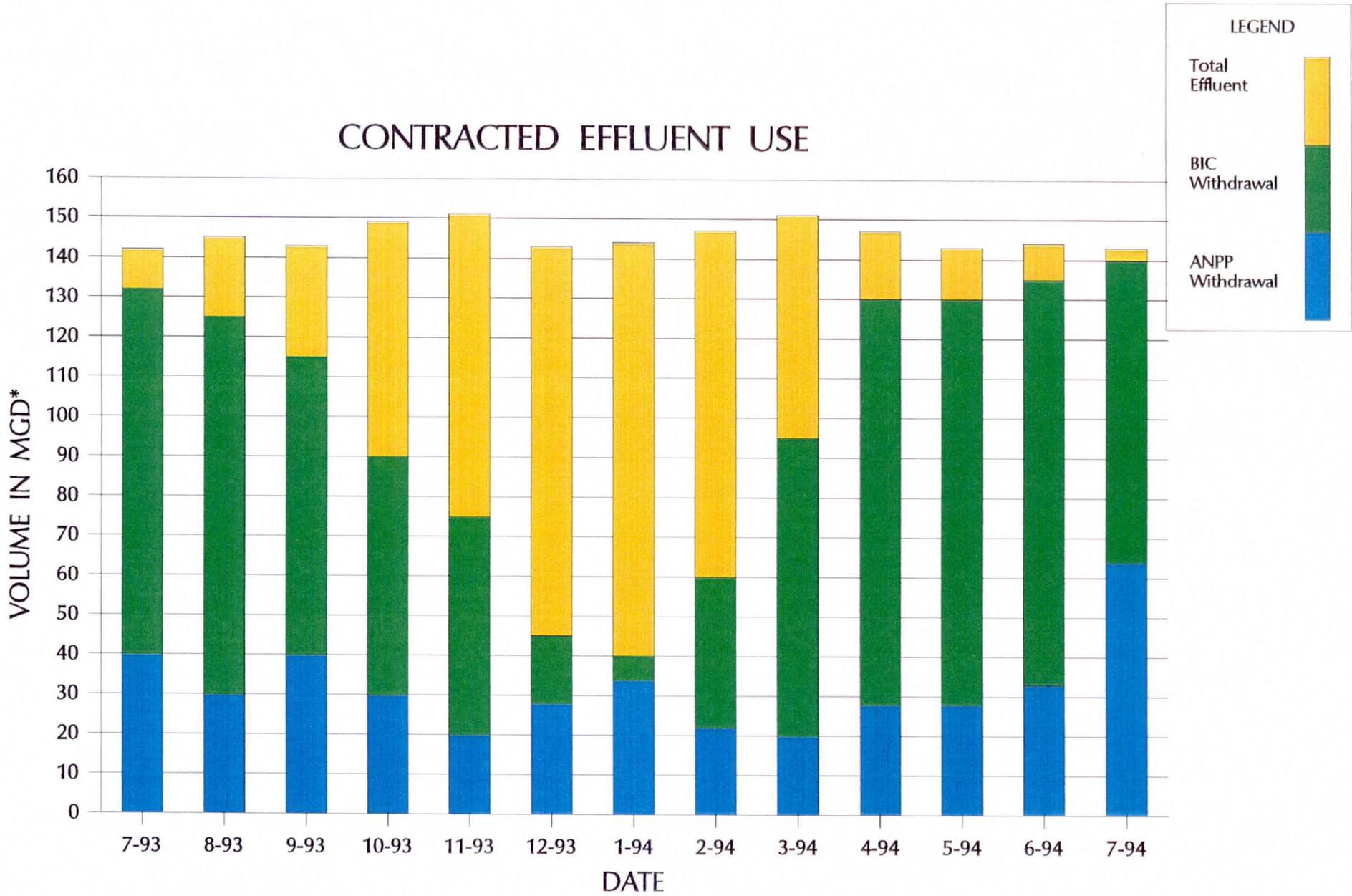
The FCDMC has developed and maintained a 1,000-foot area clear of vegetation in the Salt and Gila Rivers from 91st Avenue downstream to the Gillespie Dam. The intent of the clearing action is to maximize the hydraulic characteristics of the river channels and to reduce potential damage caused by flooding. However, the 404 Permit for the clearing project is currently under review by the Corps. In the event of the realignment of the effluent channel, the FCDMC Property Acquisition Manager must be contacted regarding uses within the District's 1,000-foot clear area right-of-way.

4.4.2. Indian Land

The Gila River Indian Reservation boundary approximately follows a low flow channel of the Salt River. The delineation of the Indian land as represented on Figures 4.8-4.11 is denoted as approximate because the exact boundary of this land is questionable. Historically, the effluent channel flowed approximately along the southern alignment alternative presented by this study. The return of the effluent to this original southern alignment, however, is not feasible without the consent of the Indian community. Through discussions with the City of Phoenix, the Indian community has indicated that they are not interested in the effluent on their property at this time. Additionally, negotiations with the Indians to move the effluent channel to their land is anticipated to be both time consuming and costly. However, the proposed channel alignments and the results of this study will be presented to the Indian Community.

4.4.3. Contracted Effluent Discharge Use

In 1971 and 1973, respectively, the City of Phoenix contracted with the Buckeye Irrigation Company (BIC) and Arizona Nuclear Power Plant (ANPP) for reuse of the 91st Avenue effluent. The realignment of the effluent channel must not prevent these contracts from being fulfilled. **Figure 4.12** shows the variations of the two contracted effluent withdrawals with respect to total effluent generated by the WWTP.



* Volumes are approximate monthly total averages.

Figure 4.12

The BIC contracted with the City of Phoenix in 1971 for use of roughly 27 mgd, or 30,000 acre-feet per year of effluent until the year 2011. Current negotiations with the BIC may increase the contracted amount to 42,000 acre-feet per year.

The BIC supplies water for irrigation to the Buckeye Water Conservation and Irrigation District. The 91st Avenue WWTP effluent obtained by the BIC is used for irrigation purposes, primarily for cotton crops. Therefore, the demands of the BIC vary widely with the growing season. The greatest demand for water for cotton crops is during the growing season of March through October, with the peak demand usually occurring in the month of July.

However, regardless of demand, the water is continuously diverted to the BIC intake, located approximately six miles downstream of the 91st Avenue Wastewater Treatment Plant. Excess water not used by the BIC is discharged to the river downstream of the Buckeye Irrigation District.

The BIC does not oppose effluent channel realignment as long as the water is not removed from the river and the BIC continues to receive their contracted amount of effluent.

The ANPP is operated by the Arizona Public Service Corporation (APS). The APS diverts effluent through a large (96-inch and 114-inch diameter) gravity flow ANPP pipeline from the WWTP prior to chlorine contact of the effluent. The APS reuses the effluent for cooling operations of the nuclear steam electrical power generating system located approximately 36 miles west of the 91st Avenue WWTP.

The usage of effluent by the ANPP is variable and unpredictable. The demand is dependent on seasonal fluctuations as well as unit requirements and maintenance shutdown. The ANPP contractual withdrawal is an option to obtain up to 140,000 acre-feet per year (approximately 125 mgd). The typical average withdrawal rates are 30–50 mgd. The ANPP is also contracted to receive effluent flow from the Tolleson WWTP of up to 8.3 mgd. Effluent is usually taken from the Tolleson WWTP prior to the 91st Avenue WWTP.

Realignment of the effluent route will not affect the ANPP withdrawal as their diversion occurs prior to effluent discharge to the Salt River.

4.4.4. Ongoing Studies

Currently the 91st Avenue Wastewater Treatment Plant uses a non-nitrifying activated sludge process to treat the wastewater generated in the Phoenix metropolitan area. The

treatment plant handles approximately 154 MGD. The sewer lines are relatively flat and have slopes that are minimal. This results in longer detention times of the wastewater received at the treatment plant. These conditions, in conjunction with the warm weather typical for this area, are conducive to a low dissolved oxygen concentration. This leads to an anaerobic condition that results in sulfide production. The presence of sulfide in the wastewater entering the treatment plant leads to the disagreeable odor that ultimately is distributed to downstream unit processes. The presence of ponding water downstream of the wastewater treatment plant may contribute to insect populations in the area. The residents of the surrounding community feel the effluent discharge water contributes to the insect presence. To address these and other issue related to the 91st Avenue WWTP processes and effects on the local community, the City of Phoenix currently has several ongoing studies as discussed below.

Odor and Air Emissions Study at the 91st Avenue WWTP
S-931071
Malcolm Pirnie, Inc.

The surrounding community identifies odor as a problem and believes these conditions impact their quality of living in an adverse manner. The City of Phoenix has a study underway to address this issue. Malcolm Pirnie, Inc. with the assistance of Damon S. Williams Associates has prepared an engineering report entitled "91st Avenue WWTP Long-Range Plan for Odor and Air Emission Control." This report assesses the impact of odors and air toxic emissions while developing a long range control plan for these pollutants.

Vector and Midge Control Program at the 91st Avenue WWTP
S-933861
Aquatic Consulting & Testing, Inc.

In response to the surrounding communities' concern with insect and pest populations and their feeling that these conditions impact their quality of living in an adverse manner, the City of Phoenix has a vector and midge control program in progress. Aquatic Consulting & Testing, Inc. has been reviewing historical data regarding insect populations in the 91st Avenue WWTP to provide a baseline for measuring the success of recent and future vector control strategies.

NdeN Conversion at the 91st Avenue WWTP
S-931030
Malcolm Pirnie, Inc.

Malcolm Pirnie, Inc. has prepared design documents for an advanced wastewater

treatment process of nitrification and denitrification. The purpose of this conversion is to improve the quality of the effluent, namely discharge levels of BOD₅, suspended solids and fecal coliform. The driving force behind this project is the anticipation of future discharge permit regulations which would require a decrease in ammonia and nitrate levels in effluent. The construction will take approximately 33 months to complete and is scheduled to begin in April or May. The construction cost is approximately \$51,000,000.

Sludge Gas Utilization at the 91st Avenue WWTP
S-931014
Black & Veatch

The Sludge Gas Utilization Study involves investigating alternatives for utilizing sludge gases generated at the 91st Avenue WWTP for power production. The study also includes strategies for air quality control.

Reclaimed Water Study
S-904037
Greeley and Hansen

Several alternative discharge options to continued discharge to the Salt River are being evaluated including constructed wetlands application, soil aquifer treatment / groundwater recharge and zero discharge.

5.0 COST ESTIMATE

5.1 COSTS ASSOCIATED WITH CHANNEL CONSTRUCTION

The construction costs associated with the rechannelization of the effluent from the 91st Avenue WWTP are based upon the Combined Effluent Flow within 1,000-Foot Clear Area Alternative. The costs consider a 3.3-mile channel, including rechannelization downstream of the culvert at 91st Avenue to 115th Avenue. The channel cross-section dimensions are as shown on the attached drawing. The cut volume for the channel is equal to the fill area for the berms and is approximately 63,402 CY. The associated construction costs were calculated assuming the following operations:

- ▶ Single Engine Conventional Scraper¹ (CAT 651) for excavation, haul and deposit
- ▶ Articulated Frame Grader (CAT 14G) for the side slopes
- ▶ 8,000-Gallon Off-Highway Diesel Powered Water Truck and Self-Propelled Pad Foot Compactor (CAT 815B) for compaction

The total equipment costs based on rental rate blue book values (for a conservative estimate) are \$183,800. The total cost for labor, assuming one superintendent, four equipment operators and one laborer, is \$125,700. The total cost is, therefore, \$309,500. This equates to roughly \$4.88/CY. This does not include costs for construction staking or dewatering if necessary.

Construction costs for the other channel route alternatives would likely be higher due to the increase in channel length. Approximate channel lengths for the remaining alternatives are as follows:

- ▶ Split Flow within 1,000-Foot Clear Area: 4 miles
- ▶ Combined Flow Returned to Southern Channel: 3.6 miles
- ▶ Split Flow Returned to Southern Channel: 4.4 miles

¹ According to information from the Flood Control District of Maricopa County, a scraper appears to be a feasible assumption for excavation equipment based upon pilot channels which have been excavated downstream of the project area.

5.2 COSTS ASSOCIATED WITH WETLANDS MITIGATION

Costs associated with wetlands mitigation from three sources were investigated to arrive at an initial unit cost per acre estimate. The first source is a study performed by researchers at the University of Maryland Center for Environmental and Estuarine Studies entitled "Making Sense of Wetland Restoration Costs." The objective of this study was to "provide reliable estimates of the costs of designing and implementing wetlands restoration costs with a reasonable commitment to both cost and performance." Average baseline costs, excluding land costs, derived from this study are as follows:

- ▶ Average cost per acre based on wetlands category ranged from \$1,000/acre for Agricultural Conversion projects to \$77,900/acre for FW Forested projects.
- ▶ Non-agricultural projects ranged from approximately \$100,000/acre for under 0.1 acre to \$10,000/acre for 1,000 acres. This indicates that an economies of scale exists due to fixed costs associated with all restoration projects.

Costs associated with the Tres Rios Demonstration Wetlands Project were also considered. The 100% construction cost estimate for the Hayfield Site was \$334,334. The Hayfield Site is a 15-acre area with two 3-acre wetlands cells. Therefore, the cost per acre of wetlands is \$55,722. The estimated cost for the Cobble Site was \$255,462. This site is 10 acres with a wetlands cell surface area of 4.3 acres. This corresponds to \$59,410 per acre of wetlands.

Also considered was the wetlands relocation project for the expansion at the Reno/Tahoe International Airport. The airport expansion required wetlands to be filled. The wetlands mitigation project consisted of two wetlands sites totalling 12 acres. The construction contract awarded was for the amount of \$974,479.00. For 12 acres of wetlands, this corresponds to \$81,207/acre.

Based on the above unit costs and an assumed areal wetlands extent of 20 acres (approximately 3.3 miles long and 50 feet wide), it appears that \$50,000 to \$70,000/acre is a reasonable estimate for the cost of wetlands mitigation in conjunction with this project. Replacement at a 2:1 ratio would result in 40 acres or \$2,000,000 to \$2,800,000 for wetlands mitigation. Assuming that mitigation at a 2:1 ratio will be required for the proposed future channel in addition to the existing channel, the total wetlands acreage would be 40 acres (two 3.3 mile long, 50-foot wide corridors). Replacement at a 2:1 ratio would result in 80 acres, or mitigation costs of \$4,000,000 to \$5,600,000.

Considering the cost of \$200/acre-foot for lost water used for maintaining riparian habitats, the

following additional mitigation costs would result. Assuming 80-acres of riparian habitat to maintain, at a water use of 6.5 acre-feet/acre, the resulting loss would be \$104,000/year.

5.3 TOTAL COST

Table 5.1 Capital Costs

Construction Activity	Calculation	Capital Cost
Channel Excavation & Berming Based upon the 1000' Clear channel alternative, Volume of Cut = Volume of Fill = 63,402 CY	63,402 CY x \$4.88/CY	\$309,402
Construction Staking 17,600 LF	\$309,402 x 1.5%	\$4,650
Dewatering ¹ Lump Sum cost = \$50,000	1 LS x \$50,000/LS	\$50,000
Wetlands Mitigation Assuming 2:1 mitigation required for existing and proposed channel alignments: 2 - 17600 LF x 50-foot wide corridors = 1,760,000 SF or 40 acres; at 2:1 replacement = 80 AC	80 AC x \$50,000/AC	\$4,000,000
Lost Water Water lost for maintaining riparian habitat: 6.5 AC-FT/AC x 80 AC = 520 AC-FT	520 AC-FT x \$200/AC-FT	\$104,000
TOTAL COSTS:		\$4,468,052

¹ Contingent upon construction occurring during dry season and with minimal groundwater encountered.

5.4 IMPLEMENTATION SCHEDULE

The major tasks associated with the effluent channel realignment consist of the permitting process, design phase and construction. The driving constituent of the permitting process will be the U.S. Army Corps of Engineers 404 Permit. The Section 404 Permitting process generally takes from six months to an excess of two years to complete. Information obtained at the investigative permitting meeting held with the U.S. Army Corps of Engineers and various other regulatory agencies revealed that for this project, the permitting process will take nearer the two year time frame. This is due to the required study of the impacts associated with relocation of the effluent channel. Because this project will impact the existing riparian vegetation present in the Salt River along with wildlife that is supported within this vegetation, an Environmental Impact Statement with a complete Alternatives Analysis must be performed. Additionally, a detailed biological assessment must be undertaken to determine the impact to endangered and threatened species that are present within the proposed project limits.

The design phase will likely take up to one year to complete and can occur concurrently with the permitting process. However, the design may require modifications to lessen impacts to the surrounding environment based upon the findings of the permitting process.

Six months (180 days) is a reasonable estimation of the necessary time frame for construction of the effluent channel realignment and associated wetlands mitigation.

Considering the total time required to complete the three project phases, the complete effluent channel relocation will take approximately 2-1/2 years to complete as indicated the implementation schedule (Figure 5.1).

IMPLEMENTATION SCHEDULE

WORK ITEM	1995												1996												1997				
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A
Permitting Process	2 YEARS																												
Design*	1 YEAR																												
Construction																													
	6 MONTHS																												

* Design time frame may vary depending upon permitting requirements

Figure 5.1

6.0 FINDINGS

After consideration of each alternative and associated constraints, the Routed to 1,000-Foot Clear-Combined Flow is recommended for the realignment of the effluent discharge route at the 91st Avenue Wastewater Treatment Plant. The combined flow alternative is recommended over the split flow variation. The combined flow alternative will utilize the existing Combined Plant Outfall channel and culvert below 91st Avenue. The split flow alternative will require more construction and increased impact to the area than the combined flow alternative. The 1,000-foot clear alternative is recommended over the southern channel alignment because the 1,000-foot clear alternative does not traverse through Indian land, thus eliminating the need for possible costly and time consuming negotiations with the Indian Community. For the previous reasons, the Routed to 1,000-Foot Clear-Combined Flow Alternative is recommended for the proposed effluent route realignment.

7.0 CONCLUSIONS

Based upon the associated project costs and implementation schedule, the City of Phoenix and the Neighborhood Citizen's Committee have determined that the realignment of the effluent channel can no longer be considered as a short-term solution to the citizens problems as they relate to the effluent channel in the river. Therefore, the City of Phoenix and the Neighborhood Citizen's Committee are in agreement that the time and money which would be required to implement the rerouting of the effluent channel will be better spent on a long term solution. Possible long term solutions are currently being investigated and addressed by several ongoing studies in which the City of Phoenix and the Neighborhood Citizen's Committee are currently involved.

8.0 REFERENCES

1. Greeley & Hansen, "91st Avenue Wastewater Treatment Plant Reclaimed Water Study," Prepared for the City of Phoenix, November 1991.
2. Simons, Li & Associates, Inc., "Concept Report: Flood Mitigation Study at the 91st Avenue Wastewater Treatment Plant," Index No. S-931105, Prepared for the City of Phoenix Water Services Department, May 1994.
3. John Corollo Engineers, "Subregional Operating Group 91st Avenue Wastewater Treatment Plant Emergency Flood Response Plan," Index No. S-905026, April 1993.
4. Arizona Municipal Water Users Association, "Status Report on the Sub-Regional Operating Group and the 91st Avenue Wastewater Treatment Plant," May 1990.
5. Greeley and Hansen, City of Phoenix and U.S. Bureau of Reclamation, "Reclaimed Water Study-Zero Discharge," Index No. S-904037.
6. Malcolm Pirnie, Inc., "NdeN Conversion at the 91st Avenue Wastewater Treatment Plant," Index No. S-931030, March 1994.
7. Black & Veatch, "Sludge Gas Utilization Study," Index No. S-931014.
8. Malcolm Pirnie, Inc. in association with Damon S. Williams Associates, "91st Avenue Wastewater Treatment Plant Long-Range Plan for Order & Air Emission Control," Index No. S-924142, June 1994.

APPENDIX A
Monthly Meeting Minutes

MONTHLY MEETING MINUTES
Effluent Discharge Route Study
at the 91st Avenue Wastewater Treatment Plant
Meeting #1: June 27, 1994
4:30 p.m. - 5:30 p.m.
INDEX NO. S-933887

ATTENDEES: Paul Kinshella, City of Phoenix
Madeline Goddard, City of Phoenix
Manny Bahraini, City of Phoenix
William Amator, Citizen
Carroll Brogdon, Citizen
Adron Reichert, Citizen
Shi-En Shiau, Greiner
Candace Huff, Greiner

1. OLD ACTION ITEMS

▶ **WORK COMPLETED**

None at this time.

2. PROGRESS SCHEDULE STATUS

▶ **WEEKLY/MONTHLY**

The schedule was discussed, amended, and acceptable to the project team. It will be updated and given to Madeline Goddard to distribute with the minutes from Meeting #1.

3. DISCUSSION ITEMS

▶ **Line of Communication:** The line of communication will be through the Management Team associated with the project. Day to day communication and pay estimates will be handled by Madeline Goddard, City of Phoenix with copies being sent to the appropriate parties. Request for change orders will be addressed to Paul Kinshella, City of Phoenix and sent attention Madeline Goddard.

▶ **Reports Available:** Paul suggested Greiner come to the City of Phoenix office to see what's available. Madeline said she would be available Tuesday (June 28th) morning at 10:00 a.m. to assist in locating the necessary information.

▶ **On-going Studies Status:** Paul discussed the status of the on-going studies and said he and Madeline would compile the information describing the current status of the studies and get a copy to Greiner.

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4. NEW ACTION ITEMS

- ▶ Public Meeting #1: Scheduled for Monday August 15, 1994 from 5:00 p.m. to 8:00 p.m. and will be held in the conference room at the 91st Avenue Wastewater Treatment Plant. Information boards, handouts, and comment cards will be available for the public to convey their questions and suggestions. Subsequent public meetings (#2 & #3) will be a presentation format open to questions and comments. Public Meeting #2 is scheduled for Tuesday October 11, 1994 at 7:00 p.m. and Public Meeting #3 is scheduled for Thursday November 17, 1994 at 7:00 p.m.

Greiner will develop a Public Meeting Notice to be reviewed by Madeline for approval and distribution. The August 08, 1994 Monthly Meeting will include a Pre-Public Meeting dry run.

- ▶ Status of Regulatory Requirements and Permits: Madeline will have this information available at the City of Phoenix office for use by Greiner. If more information is necessary, Madeline will be available for assistance.

Shi-En and Candace will meet with Madeline on Tuesday, June 28, 1994 at 10:00 a.m. to gather the necessary information.

- ▶ Progress of Partnering Process: Paul made suggestions to ask a representative from the Flood Control District of Maricopa County (Dick Perreault), Arizona Department of Environmental Quality (Brian Munson), U.S. Army Corps of Engineers (Joe Dixon), Bureau of Reclamation (Marvin Murray), Arizona Game and Fish Department (Mark Dahlberg), and U.S. Fish and Wildlife (Adron will contact). It was agreed the term "Involvement and Input" be used instead of "Partnering" to describe the respective groups participation.

Greiner will draft a letter to be reviewed by the City of Phoenix that will request the above parties to be involved and offer input relating to the project. A schedule will also be made available to the above participants.

- ▶ Status of data collection and research: Information available through Madeline and the City of Phoenix.

Shi-En and Candace will meet with Madeline on Tuesday, June 28, 1994 at 10:00 a.m. to gather the necessary information.

- ▶ Database and Base Map Preparation: This information is available through various offices at the City of Phoenix and Madeline stated she would provide Greiner with that information.

Shi-En and Candace will meet with Madeline on Tuesday, June 28, 1994 at 10:00 a.m. to gather the necessary information.

5. Comments

- ▶ The suggestion to have a meeting as a workshop meeting was brought up. The purpose of this meeting would be to develop concepts, discuss possible courses during the project, any problems that may arise, and some solutions that may be favored over others. This will be discussed further at subsequent meetings and expanded.

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6. NEXT MEETING SCHEDULE

- ▶ Monday, August 08, 1994 at 3:30 p.m., to be held at the 91st Avenue Wastewater Treatment Plant in the Neighborhood Committee Meeting Room. Paul and the City of Phoenix requested a one week to ten day notification if any meeting needed to be rescheduled.

cc: Attendees (M. Goddard to distrib.)
File

MONTHLY MEETING MINUTES
Effluent Discharge Route Study
at the 91st Avenue Wastewater Treatment Plant
Meeting #2: August 08, 1994
3:30 p.m. - 5:30 p.m.
INDEX NO. S-933887

ATTENDEES: Paul Kinshella, City of Phoenix
Madeline Goddard, City of Phoenix
Marvin Murray, Bureau of Reclamation
Adron Reichert, Citizen
Shi-En Shiau, Greiner
Candace Huff, Greiner

1. OLD ACTION ITEMS

- ▶ **MINUTES:** Review of the minutes from Meeting #1 were discussed and no comments or changes were made.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** The schedule was discussed to determine if there were any conflicts that would require adjusting the schedule. There were no conflicts expressed at this time.

3. DISCUSSION ITEMS

- ▶ **Reports Available:** Preparation for Public Meeting #1 will be completed based on the information contained within the reports available to date. Paul discussed providing Greiner with updated information the City of Phoenix may have.

Candace will contact Madeline to obtain additional information that may be needed.

- ▶ **On-going Studies Status:** Paul discussed the status of the on-going studies and said he and Madeline would compile the information describing the current status of the studies and have this information available for Greiner's use.

- ▶ **Public Meeting #1:** Madeline discussed the announcement flyers for the public meeting that had been returned with address problems. The question of whether to remove these names from future mailings was discussed. Adron said he would take the returned notices, contact the people he could and update the address list we are using.

Shi-En asked if the City of Phoenix had received any calls regarding the public meeting. Madeline stated the Flood Control District of Maricopa County and the Bureau of Reclamation had called. Candace stated Jerry Elsworth and Warren Downs of Suncor Development Company, Ken Ryan of Tri-City Chamber of Commerce, Eric Brown of the Neighborhood Citizens Committee and Anthony Silvestri of the Neighborhood Citizens Committee had called to inquire

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about details relating to the public meeting. Paul said he will address Suncor's questions regarding details related to the public meeting and this project.

Adron discussed the possibility of contacting the "Westside Group" to inform them of the public meeting. Paul suggested waiting for future meetings.

Candace discussed contacting Buckeye Irrigation Company (BIC) to take photographs of the diversion with the possibility of using the pictures at the public meeting. She discussed the concern expressed by BIC regarding the use of the photographs related to their contracted use of the effluent water. Paul stated this project will not jeopardize BIC's contracted water amounts. Paul and Madeline suggested a Public Meeting notice be mailed to BIC.

Candace will mail public meeting announcements to BIC as well as the groups invited for their Involvement and Input (Flood Control Dist. of Maricopa Co., Az. Dept. of Environ. Qual., U.S. Army Corps of Engrs., Bureau of Recl., Az. Dept. of Game & Fish, U.S. Fish & Wildlife, and the Sierra Club).

Poster Boards to be used at Public Meeting #1 were discussed and altered based on suggestions from the group. Madeline stated a plant map that Malcolm Pirnie, Inc. has used is the best to use and she would try to get a copy for Greiner's use.

Discussion of "Discharge Route Alternatives" to be displayed at the public meeting led to the conclusion that they would be displayed in graphic form. Adron expressed concern that one possible route to be considered is to return the effluent discharge to the original channel. It was mutually agreed the routes to be displayed include the existing discharge route, routing through the 1000 foot clear area or routing to the original channel. Greiner will graphically represent these discharge routes. Paul suggested Adron approve and initial the proposed routes as well as the City of Phoenix.

Comment sheets will be available for public commenting. Adron suggested a mailing address be provided to allow the public to comment at home and mail in at a later time.

Greiner will provide comment forms with a return address.

4. NEW ACTION ITEMS

- ▶ No new items discussed at this time.

5. Comments

- ▶ It was suggested that name tags be available for the participants in the public meeting along with a sign-in sheet for the public. Greiner will provide these items.
- ▶ Adron requested the parking lot in front of the Administration Building be vacant for citizens to congregate. Paul and Madeline will see to this.
- ▶ Shi-En requested access to the Conference Room one hour in advance of the public meeting in order to set up. Madeline said she would be sure the room was vacant.
- ▶ Refreshments will be arranged by Madeline and the City of Phoenix.

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6. NEXT MEETING SCHEDULE

- ▶ Public Meeting #1: Monday, August 15, 1994 from 5:00 p.m. to 8:00 p.m. to be held at the 91st Avenue Wastewater Treatment Plant in the Conference Room.
- ▶ Meeting #3: Thursday, September 01, 1994 at 3:30 p.m. in the Neighborhood Committee Meeting Room. Paul and the City of Phoenix requested a one week to ten day notification if any meeting needed to be rescheduled.

cc: Attendees (M. Goddard to distrib.)
File

MONTHLY MEETING MINUTES
Effluent Discharge Route Study
at the 91st Avenue Wastewater Treatment Plant
Meeting #3: September 02, 1994
4:30 p.m. - 6:00 p.m.
INDEX NO. S-933887

ATTENDEES: Paul Kinshella, City of Phoenix
Madeline Goddard, City of Phoenix
Marvin Murray, Bureau of Reclamation
John Svechovsky, Flood Control District of Maricopa County
Adron Reichert, Citizen
William Amator, Citizen
Shi-En Shiau, Greiner
Candace Huff, Greiner

1. OLD ACTION ITEMS

- ▶ **MINUTES:** Review of the minutes from Meeting #2 were discussed and no comments or changes were made.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** The schedule was discussed to determine if there were any conflicts that would require adjustments. Monthly meeting #4 was moved to Thursday October 06, 1994 at 4:30 p.m. to aide in preparation for Public Meeting #2. The project status is on schedule.

3. DISCUSSION ITEMS

- ▶ **Public Meeting #1:** Comments generated by the community were compiled and distributed to the monthly meeting attendees for discussion. Updates were provided regarding the various projects and studies in progress at the 91st Avenue Wastewater Treatment Plant dealing with the concerns expressed by the surrounding community. These included the Sludge Dewatering Facilities and the 91st Avenue Wastewater Treatment Plant NdeN project. The public meeting was attended by approximately 22 people and generated comments from 5 of the participants.
- ▶ **Preliminary System Layout:** Alternative channel locations were plotted on a topographic map of the area. The various channel locations were discussed with the committee and it was suggested actual site photographs be used to visually illustrate the proposed channel locations. The question of why the discharge channel only proceeds to 115th Avenue was raised. The Southern Channel alternative was addressed and it was indicated the Indian Community will need to be involved in order to discuss the possibility of this channel alternative.

The public's perception of this project was discussed with respect to project goal. It was determined the focus of the project is to move the effluent discharge as far from people as possible, to dewater low pockets and to eliminate standing water. The need for the public to understand these goals was identified and that the public not view this project as a flood control

measure solution. An additional objective with respect to the project may be to move the effluent discharge as quickly as possible from the treatment plant to the Agua Fria River. Discussion also included the historic behavior of the Salt River under flood conditions and how the low flow channels are affected by flooding. The placement of a channel was addressed and how it would require maintenance to ensure its integrity after flood conditions.

It was decided that development of a newsletter to distribute to the public describing the study goal of moving the effluent discharge from the treatment plant to the Agua Fria River and to remove the standing water which contributes to insects and odors was necessary. Greiner, Inc. will prepare a newsletter to be distributed to the surrounding community describing the study goal. Discussion regarding involvement by ADEQ in this project was addressed by the committee. An effort will be made to solicit their participation in monthly as well as public meetings.

Paul will set a meeting with the Indian Community to discuss the Southern Route Alternative.

- ▶ Discharge Channel Stability and Efficiency: The committee was provided with calculations of various cross-sections, their related water velocities and associated depths of flow. The possible constraints such as optimum water velocity, channel width and channel stability were also presented and discussed. Information was presented regarding water surface profiles, variation in flow velocity, variation in flow depth and variation in flow width during flood conditions. This information is part of a study conducted by Simons, Li & Associates, Inc. and will be incorporated into this study. The committee agreed to leave the existing Northern Channel out of the cross-section calculations and show it as its actual cross-section. The possible design cross-sections presented were a cut section, a berm section or to follow the low flow channel.
- ▶ Impact Assessment/Mitigation: Various changes that may occur to the existing vegetation with channel redirection were discussed. The possible permit constraints required if dredging and filling are needed with channel redirection were presented. Additionally, if the channel were to need continued maintenance after construction and flooding, 404 permitting may become time consuming and costly.

4. NEW ACTION ITEMS

- ▶ Greiner, Inc. will prepare a newsletter describing the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant. The newsletter will also include upcoming events to inform the surrounding community. A draft of the letter will be sent to Madeline for review.
- ▶ Paul will initiate a meeting with the Indian Community to discuss the proposed alternative routes.
- ▶ Preparation of the topographic map by Greiner, Inc. will include the adjacent property owners boundaries. Discussed with Madeline at a later date and she stated the City of Phoenix has this information and will provide Greiner, Inc. with what ever can be located.

5. Comments

- ▶ Poster boards and presentation material for Public Meeting #2 will be prepared and distributed to the committee one week prior to the meeting to solicit comments and suggestions. Greiner, Inc. will prepare the necessary information and circulate it to the committee for review.

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6. NEXT MEETING SCHEDULE

- ▶ Meeting #4: Has been changed from Tuesday October 11, 1994 to Thursday, October 06, 1994 at 4:30 p.m. in the Neighborhood Committee Meeting Room. Enclosed is an updated schedule.
- ▶ Public Meeting #2 is scheduled for Tuesday October 11, 1994 at 7:00 p.m. The format is a presentation.

cc: Attendees (M. Goddard to distrib.)
File

Project No. E037600

*Effluent Discharge Route Study
at the 91st Avenue Wastewater Treatment Plant*

MONTHLY MEETING MINUTES

Meeting #4: October 6, 1994

5:00 p.m. - 6:00 p.m.

INDEX NO. S-933887

ATTENDEES:	Paul Kinshella	-	City of Phoenix
	Madeline Goddard	-	City of Phoenix
	Manny Bahraini	-	City of Phoenix
	Gary Ullinsky	-	City of Phoenix
	Ron McKinstry	-	U.S. Fish and Wildlife
	Adron Reichert	-	Citizen
	William Amator	-	Citizen
	Carroll Brogdon	-	Citizen
	Shi-En Shiau	-	Greiner
	Candace Huff	-	Greiner

1. OLD ACTION ITEMS

- ▶ **MINUTES:** Review of the minutes from Meeting #3 were discussed; no comments or changes were made.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** The schedule was discussed to determine if there were any conflicts that would require adjustments. Monthly Meeting #5 is scheduled for Thursday, November 3, 1994 and is rescheduled for 5:00 p.m. Public Meeting #3 is scheduled for Thursday, November 17, 1994 and will be held at 7:00 p.m. Shi-En requested an additional monthly meeting prior to Public Meeting #3 in order to review and prepare for the final Public Meeting presentation. The committee agreed to add Monthly Meeting #6 scheduled for Thursday, November 10, 1994 at 4:00 p.m.

3. DISCUSSION ITEMS

- ▶ **Preliminary System Layout:** Discussion was raised about whether or not to consider the southerly channel alternative. The City of Phoenix is in the process of arranging a meeting with the Indian Community to address the southern channel alternative. The consensus of Monthly Meeting #4 is to consider the southerly channel until the meeting with the Indian Community indicates another direction.
- ▶ **Discharge Channel Stability and Efficiency:** Analysis and evaluation of channel cross-sections using computer modeling procedures are being completed.
- ▶ **Impact Assessment/Mitigation:** Evaluation of impacts to the existing site conditions is being completed. This analysis includes vegetation impacts, soil and sediment impacts, as well as groundwater conditions currently displayed within the project limits. Ron McKinstry of U.S. Fish and Wildlife discussed the dynamic nature of the river resulting from flooding. Movement of the channel from the existing location would generate the

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91st Avenue Wastewater Treatment Plant

MONTHLY MEETING MINUTES

Meeting #4: October 6, 1994

Page 2

need for a 404 permit. Additionally, impacts to the wildlife and vegetation will be assessed and may carry mitigating criteria.

- ▶ Indian Community: Work continues toward arranging a meeting with the Indian Community in order to discuss the southern channel alternative.
- ▶ Public Meeting #2: The Public Meeting #2 bulletins that were returned through the mail were given to Adron along with extra bulletins for posting around the community. The public meeting format will be a presentation made by the City of Phoenix and Greiner with time allowed for questions and open discussion. The meeting outline was reviewed and changes were made based on input from the management team associated with this project. Chairs and a projector will be set-up for the presentation along with refreshments.

4. NEW ACTION ITEMS

- ▶ Paul continues working toward confirming a meeting with the Indian Community to discuss the proposed channel routes. Additionally, Paul will contact EPA to invite them to the monthly meetings in order to provide input with respect to this project.
- ▶ Madeline will arrange for Public Meeting #2 set-up and refreshments at the 91st Avenue Wastewater Treatment Plant.
- ▶ Greiner, Inc. continues work on the topographic map for analysis of channel cross-sections as well as evaluation of vegetation and groundwater within the project limits.

5. COMMENTS

- ▶ Discussion to add a monthly meeting prior to Public Meeting #3 in order to evaluate presentation materials and format.

6. NEXT MEETING SCHEDULE

- ▶ Meeting #5: Thursday November 3, 1994 at 5:00 p.m. in the Neighborhood Committee Meeting Room. An additional monthly meeting (Monthly Meeting #6 on November 10, 1994 at 4:00 p.m.) was added to review presentation material for Public Meeting #3.
- ▶ Public Meeting #3 is scheduled for Thursday November 17, 1994 at 7:00 p.m. The format is a presentation.

CH/ml
MN100694.GEN

cc: Attendees (M. Goddard to distribute)
Correspondence File

MONTHLY MEETING MINUTES
Effluent Discharge Route Study
at the 91st Avenue Wastewater Treatment Plant
Meeting #6: November 10, 1994
4:00 p.m. - 5:00 p.m.
INDEX NO. S-933887

ATTENDEES: Paul Kinshella, City of Phoenix
Madeline Goddard, City of Phoenix
Gary Ullinsky, City of Phoenix
John Svehovsky, Flood Control District of Maricopa County
Russell Haughey, Arizona Game and Fish Department
Adron Reichert, Citizen
William Amator, Citizen
Carroll Brogdon, Citizen
Shi-En Shiau, Greiner
Candace Huff, Greiner

1. OLD ACTION ITEMS

- ▶ **MINUTES:** The minutes from Meeting #4 were discussed and no comments or changes were made. Meeting #5 was canceled at the Neighborhood Citizens' request.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** The schedule was discussed to determine if there were any conflicts that would require adjustments. Monthly Meeting #7 was moved to Thursday, December 08, 1994, at 4:00 p.m. The project status is on schedule.

3. DISCUSSION ITEMS

- ▶ **Public Meeting #2:** Comments generated by the community were compiled and distributed to the monthly meeting attendees for discussion. One question posed by a citizen at the public meeting was, "During the temporary wetlands project, what is being done to control the insects?" This led to a general discussion regarding the insect traps and insect counts that have been obtained. These counts will continue to be monitored as part of the Vector and Midge Control Study.
- ▶ **Study Reach:** The question of whether to evaluate the proposed channel from the 91st Avenue Wastewater Treatment Plant to 115th Avenue or to the Agua Fria River was addressed. The committee felt that analysis to 115th Avenue would be adequate. From 115th Avenue to the Agua Fria River the effluent discharge follows the low flow channel in the Salt River and is centrally located in the river. The project information and maps should include and display the effluent discharge route from 115th Avenue to the Agua Fria River following the low flow channel. It was suggested the public be asked their opinion at the next public meeting which will take place on Thursday, November 17, 1994, at 7:00 p.m.

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- ▶ Indian Community: Work continues toward the discussion of the Southern Channel Alternative with the Indian Community. A meeting has been set to present this alternative, along with the Central Channel Alternative, later this month.
- ▶ Capital & Life Cycle Cost Estimates: Analysis of costs related to the channel construction is continuing.
- ▶ Monthly Meeting #5: Monthly Meeting #5 was held on Thursday, November 03, 1994, and was an informal meeting. It was attended by representatives from the Environmental Protection Agency, Arizona Game and Fish Department, U.S. Bureau of Reclamation, Flood Control District of Maricopa County, U.S. Fish and Wildlife, City of Phoenix and Greiner, Inc. Issues raised ranged from moving the effluent discharge channel to a zero discharge possibility, and led to the determination that a meeting with the U.S. Army Corps of Engineers was necessary with respect to the permitting required for this project. This investigative meeting with the U.S. Army Corps of Engineers was scheduled for Tuesday, November 08, 1994. Enclosed is a draft of the minutes that resulted from the investigative meeting.

It was determined that the process to obtain a U.S. Army Corps of Engineers 404 permit will involve an Environmental Assessment to identify any impacts. The impacts associated with relocation of the effluent channel will be significant and require the completion of an Environmental Impact Study (EIS). This could be a one- to two-year process and include mitigating criteria for the project which would be based on disrupted acreage at better than a one-to-one replacement requirement. The U.S. Army Corps of Engineers also suggested they will be looking for a long-term solution as part of the EIS. One question raised at our monthly meeting was whether the U.S. Army Corps of Engineers will issue a permit. It was felt that a permit may be issued but it will be difficult based on the degree of impact to the existing wetlands and wildlife occupying this portion of the Salt River. Additionally, the cost/benefit ratio will need to be evaluated with respect to this project to evaluate feasibility related to the associated impacts.

Information regarding the potential impacts with respect to this project will be solicited from the agencies involved in the evaluation for a U.S. Army Corps of Engineers 404 Permit. Informal information will be gathered by Greiner, Inc. from the various agencies involved in the permitting process.

4. NEW ACTION ITEMS

- ▶ Study reach limits will be clarified at Public Meeting #3.
- ▶ Paul continues working toward meetings with the Indian Community to discuss the proposed channel routes.
- ▶ Madeline will arrange for Public Meeting #3 set-up and refreshments at the 91st Avenue Wastewater Treatment Plant.
- ▶ Public Meeting #3 outline was discussed and no changes were made.
- ▶ Greiner, Inc. will prepare a packet discussing the scope of this project along with information describing the proposed channel routes, to be distributed to regulatory agencies involved in permit evaluation. The information solicited will be informal and aide in the parameters to be addressed in the permitting process.

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5. **Comments**

6. **NEXT MEETING SCHEDULE**

- ▶ Public Meeting #3 is scheduled for Thursday, November 17, 1994, at 7:00 p.m. The format is a presentation.
- ▶ Monthly Meeting #7: Discussion of schedule conflicts led to the rescheduling of Monthly meeting #7 to Thursday, December 08, 1994, at 4:00 p.m. Enclosed is an updated schedule.

cc: Attendees (M. Goddard to distrib.)
File

MONTHLY MEETING MINUTES
Effluent Discharge Route Study
at the 91st Avenue Wastewater Treatment Plant
Meeting #7: December 08, 1994
4:00 p.m. - 5:00 p.m.
INDEX NO. S-933887

ATTENDEES:	Paul Kinshella	-	City of Phoenix
	Madeline Goddard	-	City of Phoenix
	Marvin Murray	-	Bureau of Reclamation
	Ron McKinstry	-	U.S. Fish and Wildlife
	David Meinhart	-	Flood Control District of Maricopa County
	Russell Haughey	-	Arizona Game and Fish Department
	Adron Reichert	-	Citizen
	William Amator	-	Citizen
	Candace Huff	-	Greiner, Inc.

1. OLD ACTION ITEMS

- ▶ **MINUTES:** The minutes from Meeting #6 were discussed; no comments or changes were made.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** The schedule was discussed to evaluate any conflicts that may require adjustments. It was determined that Monthly Meeting #8 would be postponed along with the project completion date.

3. DISCUSSION ITEMS

- ▶ **Public Meeting #3:** Comments generated by the community were compiled and distributed to the monthly meeting attendees for discussion. The attendees had no additional comments from the Public Meeting and no changes were made to the compiled comments. (See attached comment summary sheet for the compiled comments generated from the public meeting)
- ▶ **Public Meeting regarding the 116th Avenue Bridge Project:** An Open House to present details and the 40% design of the 116th Avenue Bridge was held on Thursday, December 01, 1994. A project detail sheet was collected and is included with these minutes for information.

Greiner

- ▶ Indian Community: Work continues toward the discussion of the Southern Channel Alternative with the Indian Community. A meeting will be set for either December or January to present this alternative along with the Central Channel Alternative.
- ▶ Information Gathering from Regulatory Agencies: A follow-up letter was sent to Flood Control District of Maricopa County, U.S. Army Corps of Engineers, Arizona Game and Fish Department, U.S. Environmental Protection Agency, Region IX, Arizona Department of Environmental Quality, Bureau of Reclamation and U.S. Fish and Wildlife to request return of their input regarding the impact of this project with respect to each agency's jurisdiction. The agency representatives present at the monthly meeting informed the committee that their agencies' responses would be sent within the next week. Additionally, Marjorie Blaine with the U.S. Army Corps of Engineers, informed Greiner, Inc. that she will be handling the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant. She would like to walk the project site to evaluate the wetland and riparian habitat that, currently exists in order to provide comments relating to the U.S. Army Corps of Engineers jurisdiction.
- ▶ Property Boundary Map: An updated property boundary map was distributed for discussion. Additional changes were made and will be incorporated into the current project information. There was discussion regarding the status of the City of Phoenix property between 99th Avenue and 107th Avenue. The ownership will be clarified by Greiner, Inc. in conjunction with the City of Phoenix and added to the property boundary map. Additionally, the need to detail the boundary between state and federal land was identified. To further delineate between state and federal land, suggestions were made to contact the State Land Department for their current information.

4. NEW ACTION ITEMS

- ▶ Greiner, Inc. to include a copy of the data sheet discussing the 116th Avenue Bridge Project with these minutes.
- ▶ Paul and the City of Phoenix continue working toward meetings with the Indian Community to discuss the proposed channel routes.
- ▶ Greiner, Inc. will continue with follow-up and compilation of information provided by the various regulatory agencies regarding associated impacts relating to this project.
- ▶ Greiner, Inc., in conjunction with the City of Phoenix, will update the property boundary map to be included in this project.
- ▶ Project Completion: The project completion will be extended to a later date. A revised schedule will be submitted by Greiner, Inc. for review and comment from the City of Phoenix and the Citizens' Committee. The amended schedule will include Monthly Meeting #8, any additional Monthly Meetings, a final Public Meeting at or near project completion and the new project completion date. The extension of the project will be covered by a "No Cost Change Order."

Greiner

5. **Comments**

6. **NEXT MEETING SCHEDULE**

- ▶ Monthly Meeting #8: Monthly Meeting #8 is postponed and will be included in the revised schedule along with an additional Public Meeting and the final project completion date.

cc: Attendees (M. Goddard to distrib.)

Dick Perreault	-	Flood Control District of Maricopa County
Brian Munson	-	Arizona Department of Environmental Quality
James Matt	-	Arizona Department of Environmental Quality
Joe Dixon	-	U.S. Army Corps of Engineers
Marjorie Blaine	-	U.S. Army Corps of Engineers
Cindy Lester	-	U.S. Army Corps of Engineers
Marc Dahlberg	-	Arizona Game and Fish
Don Steuter	-	Sierra Club; Grand Canyon Chapter
Jacques Landy	-	U.S. Environmental Protection Agency, Region IX
File		

Project No. E10037600

***EFFLUENT DISCHARGE ROUTE STUDY
AT THE 91ST AVENUE WASTEWATER TREATMENT PLANT
INDEX NO. S-933887***

Monthly Meeting Minutes

Meeting #8 - February 9, 1995

4:00 p.m. - 5:00 p.m.

ATTENDEES:

Paul Kinshella	-	City of Phoenix
Madeline Goddard	-	City of Phoenix
Felicia Terry	-	Flood Control District of Maricopa County
Lisa Zinner	-	Arizona Department of Environmental Quality
Adron Reichert	-	Citizen
Shi-En Shiau	-	Greiner, Inc.
Alison Boldt	-	Greiner, Inc.

1. OLD ACTION ITEMS

- ▶ **MINUTES:** No comments or changes were made to the minutes from Meeting #7.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** The revised schedule was distributed and discussed to evaluate any conflicts that may require adjustments. It was determined that an additional monthly meeting would be scheduled prior to Public Meeting #4. This meeting, Monthly Meeting #9, will be held on Thursday, March 9, 1995, at 4:30 p.m. in the Training Room at the 91st Avenue WWTP. Public Meeting #4 will be held on Thursday, March 16, 1995, at 7:00 p.m. in the Conference Room at the WWTP.

3. DISCUSSION ITEMS

- ▶ **Review of Information Gathered from Regulatory Agencies:** Packets containing copies of all the letters received from the various regulatory agencies as well as a summary letter of the responses were distributed to the attendees. The summary letter contained a table outlining the responses which was used as a worksheet at the meeting to obtain committee input on the agencies' comments. The committee indicated that the comment by the Flood Control District of "slight preference to central channel" should be clarified that this applies only if the channel is moved from its original alignment. Paul indicated that mitigation should include the realigned channel in addition to the current channel alignment. Establishment of project purpose and need as a part of the Section 404 Permit process was discussed. The committee indicated that justification for the project is as follows:

Greiner

EFFLUENT DISCHARGE ROUTE STUDY 91ST AVE. WASTEWATER TREATMENT PLANT Monthly Meeting Minutes #8 - February 9, 1995

Page 2

- If suitable means for protecting the citizens' interests and needs cannot be achieved, then the City may be forced to remove all effluent from the river. This would tend to make the Zero Discharge Alternative more appealing and cost effective.
- The settlement requires a study to evaluate alternatives for relocating the effluent channel to see if this would improve the quality of life in the surrounding area. The original idea was to return the effluent route to its original southern alignment. However, that was before the study revealed the requirements which may limit that alternative.
- ▶ **Capital & Life Cycle Costs:** An initial construction cost analysis was presented at the meeting. Paul indicated that the cost analysis should also address life cycle costs in terms of the extent of annual channel maintenance and the frequency of floods that would necessitate repair to the channel. He also added that the mitigation costs should be included in the capital cost analysis and that the costs for water to maintain the existing riparian habitats should be included at \$200/ac-foot.
- ▶ **Impact Assessment/Mitigation:** Preliminary unit costs associated with wetlands replacement/mitigation were presented at the meeting. Paul commented that the mitigation should be considered at a 2:1 ratio for both the proposed channel alignment and the existing channel alignment.
- ▶ **Indian Community:** Paul would like a project summary report to present to the Indian Community for discussion with respect to the possibility of the Southern Channel Alternative.
- ▶ **Property Boundary Map:** An updated property boundary map was distributed for discussion. Additional changes were made and will be incorporated into the current project information. There was discussion regarding the status of the City of Phoenix property between 91st Avenue and 99th Avenue. The ownership will be clarified by Greiner, Inc. in conjunction with the City of Phoenix and added to the property boundary map. Additionally, Adron Reichert indicated that he would research the ownership of a parcel currently labelled as unknown private owner.

4. NEW ACTION ITEMS

- ▶ Greiner, Inc. to integrate committee input into agency comments for final report.
- ▶ Greiner, Inc. to consider life cycle costs for rechannelization and to include mitigation costs with the Capital & Life Cycle cost estimate.

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EFFLUENT DISCHARGE ROUTE STUDY 91ST AVE. WASTEWATER TREATMENT PLANT

Monthly Meeting Minutes #8 – February 9, 1995

Page 3

- ▶ Greiner, Inc. to revise mitigation costs to include cost for water for maintaining riparian habitats and cost for mitigation of both existing and proposed channels.
- ▶ Greiner, Inc., through coordination with the City of Phoenix, will prepare a summary report of the study to date and the proposed alternate channel alignments for presentation to the Indian Community.
- ▶ Greiner, Inc., in conjunction with the City of Phoenix and Adron, will update the property boundary map to be included in this project.

5. NEXT MEETING SCHEDULE

- ▶ Monthly Meeting #9 is scheduled for Thursday, March 9, 1995 at 4:30 p.m.

AB/ml

MN020995.91A

cc: Attendees (M. Goddard to distribute)

Marvin Murray	-	Bureau of Reclamation
Dick Perreault	-	Flood Control District of Maricopa County
Brian Munson	-	Arizona Department of Environmental Quality
Marjorie Blaine	-	U.S. Army Corps of Engineers
Russell Haughey	-	Arizona Game and Fish
Marc Dahlberg	-	Arizona Game and Fish
Ron McKinstry	-	U.S. Fish and Wildlife Service
Don Steuter	-	Sierra Club; Grand Canyon Chapter
Jacques Landy	-	U.S. Environmental Protection Agency, Region IX
Correspondence File		

Project No. E10037600

***EFFLUENT DISCHARGE ROUTE STUDY
AT THE 91ST AVENUE WASTEWATER TREATMENT PLANT
INDEX NO. S-933887***

Monthly Meeting Minutes

Meeting #9 - March 15, 1995

1:00 p.m. - 2:00 p.m.

ATTENDEES:

Paul Kinshella	-	City of Phoenix
Madeline Goddard	-	City of Phoenix
Adron Reichert	-	Citizen
Shi-En Shiau	-	Greiner, Inc.
Alison Boldt	-	Greiner, Inc.

1. OLD ACTION ITEMS

- ▶ **MINUTES:** No comments or changes were made to the minutes from Meeting #8.

2. PROGRESS SCHEDULE STATUS

- ▶ **WEEKLY/MONTHLY:** Monthly Meeting #9 had been previously scheduled for Thursday, March 9, 1995 at 4:30 pm at the 91st Avenue WWTP. This meeting was rescheduled to Wednesday, March 15, 1995 at 1:00 pm at the City of Phoenix Water Services Department, 200 W. Washington Street. Public Meeting #4 remains scheduled for Thursday, March 16, 1995, at 7:00 p.m. in the Conference Room at the WWTP.

3. DISCUSSION ITEMS

- ▶ **Proposed Channel Alternatives / Recommended Alignment:** Three proposed variations of the recommended "Routed to 1000-foot Clear" alternative were presented to the committee for review. The three variations are based upon the constructability of the 1000-foot clear alternative. The first proposed alignment consists of essentially the original "Routed to 1000-foot Clear" alternative. This proposed channel roughly follows the northern edge of the Gila River Indian Reservation boundary. AutoCAD / DCA generated profile and cross-sections of this alignment reveal that a considerable amount of cut and fill will be required to construct this alternative (64,000± CY). Therefore, two additional variations of the "Routed to 1000-foot Clear" alternative were presented for discussion, both of which take advantage of naturally occurring

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EFFLUENT DISCHARGE ROUTE STUDY 91ST AVE. WASTEWATER TREATMENT PLANT

Monthly Meeting Minutes #9 - March 15, 1995

Page 2

low flow channels to reduce required cut and fill volumes by almost half. However, both variations traverse partially through Indian land. Therefore, the Committee determined that the original 1000-foot clear alternative, although requiring more construction and thus producing more impact to the existing area, would result in less time and cost than the negotiations required to rechannel the effluent through Indian land.

- ▶ Report Table of Contents: The proposed Table of Contents for the final Conceptual Report was reviewed by the Committee. The City of Phoenix indicated that a section or an appendix should be designated for Public Input and shall include the comments received during public meetings.
- ▶ Capital & Life Cycle Costs: The cost estimate revised per Monthly Meeting #8 was reviewed for use in the final report as well as for presentation at the Public Meeting #4. The Committee determined that the Operation & Maintenance Costs presented in the cost estimate should not be required for a short term solution. However, these costs will be kept in the project file.
- ▶ Property Boundary Maps: An updated property boundary map was distributed for discussion. Adron Reichert commented on the ownership of some land parcels on Section #32. The property maps shall be revised and the project file shall indicate that these changes were made per Adron's comments.

4. NEW ACTION ITEMS

- ▶ Public Meeting #4: The General Outline for the Public Meeting #4 presentation was reviewed and modified per the Committee's comments. Overheads to be used at the meeting will include the Matrix of Agencies' Comments, the cost estimate, and a time of implementation schedule for the project. The implementation schedule shall indicate the following:
 - 2 year time frame for permitting with design occurring concurrently
 - 6 month time frame for construction

At the Public Meeting, Greiner, Inc. will present that the study finds the "Routed to 1000-foot Clear" alternative is the most feasible realignment of the effluent channel. Paul & Adron will conclude that due to the cost and time frame required to implement

Greiner

**EFFLUENT DISCHARGE ROUTE STUDY
91ST AVE. WASTEWATER TREATMENT PLANT
Monthly Meeting Minutes #9 - March 15, 1995**

Page 3

the effluent channel realignment, this solution is no longer considered short term and the money may be better spent on a long term solution.

- ▶ Greiner, Inc. will revise the General Outline for Public Meeting #4 per the comments made by the Committee.
- ▶ Greiner, Inc. will revise the Capital & Life Cycle Costs to eliminate Operation & Maintenance costs per the Committee's request.
- ▶ Greiner, Inc. will prepare an Implementation Schedule to be presented at the Public Meeting and included in the final report.

5. NEXT MEETING SCHEDULE

- ▶ Public Meeting #4 is scheduled for Thursday, March 16, 1995 at 7:00 p.m.

AB
WWTPMM09.DOC

cc: Attendees (M. Goddard to distribute)
Correspondence File

APPENDIX B
Regulatory Agency Response

12/4/94

Buckeye Irrigation Company
Buckeye Water Conservation & Drainage District

Ms. Candace Huff
Greiner, Inc.
7310 North 16th Street, Suite 160
Phoenix, AZ 85020-2402

RE: COMMENTS ON 91st AVENUE WASTEWATER TREATMENT PLANT
EFFLUENT DISCHARGE ROUTE STUDY
PUBLIC MEETING NO. 3

Dear Ms. Huff,

It was not clear to me whom I should send these comments regarding the referenced public meeting. Please see that these comments are delivered to the proper recipient. I also extend our appreciation for providing a forum to explain our needs as it pertains to this project.

Initially, the Buckeye Irrigation Company and the Buckeye Water Conservation & Drainage District (District) have no objection to the proposed designs or alignments of the channel relocation. As long as surface water is not diverted, withdrawn or otherwise reduced of flow there will be no objection to the proposal. We have every reason to believe that a more direct route with a defined direction of flow will benefit the District by reducing losses from evaporation and wasted by salt cedar growth. We have observed that when these noxious weeds are cleared along a stream that many cottonwood trees will sprout and riparian conditions improve. We also agree with the spokesman from Holly Acres that the water should remain in the river but with enough channel management to control insects and odors.

The District is concerned that the project may have a sever flaw however. At the public meeting I understood that if a Right of Way could be arranged and permits issued to establish the new channel to the south that there is no plan to maintain it. It appears that the existing channel is located where the water wants to go. To divert this stream it will require a structure of adequate elevation. If the new channel is allowed to overgrow and reduce the flow area the diversion structure would need to be elevated or fail. At some point, without management, the diversion structure would endanger Holly Acres in the event of a major flood in the river. The District recommends the study evaluate this scenario and include maintenance in the cost of this proposal.

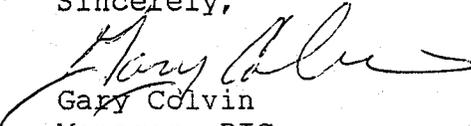
BUCKEYE IRRIGATION COMPANY
P.O. BOX 1726, BUCKEYE, AZ 85326

12/4/94

Absent the maintenance program, the District recommends that this project merge with the planned pilot project called Tres Rios. This plan incorporates the use of the same river segment as part of the treatment process of the 91 Avenue Wastewater Treatment Plant. A constructed wetland will be designed to allow the riverbed and planted vegetation to cleanse the effluent. This type of channel would be maintained to ensure the proper retention time necessary to accomplish the water treatment. Rather than divide resources with a maintained alternate channel or wasted on a poorly maintained channel a merge of the two would best suit the District and local citizens.

The District will cooperate with all concerned to create a more productive and less offensive river segment. We will oppose any attempt to take the water out of the river at any point between the 91st Avenue plant and our diversion. If I can be of assistance, you can contact me at 602-386-2196.

Sincerely,


Gary Colvin
Manager, BIC



DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
ARIZONA-NEVADA AREA OFFICE
3636 NORTH CENTRAL AVENUE, SUITE 760
PHOENIX, ARIZONA 85012-1936

REPLY TO
ATTENTION OF:

Office of the Chief
Regulatory Branch

DEC 5 1994

Greiner, Inc.
ATTN: Mr. Shi-En Shiau, P.E.
7310 N. 16th Street, Suite 160
Phoenix, Arizona 85020-2402

File Number: 95-40119-00-MB

Dear Mr. Shiau:

This is in response to your letter dated December 1, 1994 requesting our input regarding potential impacts and effects associated with the rechannelization of the effluent discharge route from the 91st Avenue Wastewater Treatment Plant into the Salt River, near Tolleson, Maricopa County, Arizona (Sections 31-34, T1N, R1E).

The U.S. Army Corps of Engineers regulates the discharge of dredged and/or fill material into waters of the United States including adjacent wetlands under Section 404 of the Clean Water Act. Corps jurisdiction in the absence of adjacent wetlands extends below the plane of the ordinary high water mark (OHWM). A site visit was conducted by Ms. Marjorie Blaine and Mr. Larry Flatau of my staff on December 13, 1994 during which it was determined that there are waters of the U.S. including wetlands within the proposed realignment areas. Therefore, a permit under purview of Section 404 will be required prior to realignment of the channel. If the study concludes that realignment is viable, our office should be requested to conduct a formal jurisdictional delineation/wetland determination before an application is submitted.

It appears that all of the proposed alternative realignment routes cross the Tres Rios Constructed Wetlands Research and Demonstration Project, Cobble site, which will be under construction this year. You should coordinate with the Bureau of Reclamation, Phoenix Office, to avoid impacts to this area. While this is only a three-year project, wetlands established by it and which remain as a result of it will be considered jurisdictional under Section 404.

The proposed routes include other areas which are considered to be high resource in terms of wildlife. There are valuable riparian habitats in the site which may or may not be wetlands. An official delineation by our office in accordance with our 1987 Wetland Delineation manual will establish the boundary of wetlands. The

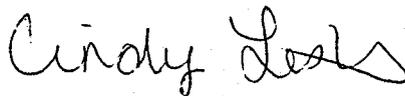
Corps has no jurisdiction over non-wetland riparian areas (above the plane of the OHWM), however, preservation of these habitats is highly recommended. In addition, the realignment may affect the Federally endangered Yuma clapper rail (Rallus longirostris yumanensis), and will require consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

Projects which require an individual Section 404 permit also require an alternatives analysis in accordance with 40 CFR 230, 404(b)(1) guidelines. There must be an established need and purpose for the project. The preferred alternative for which an application is submitted must be the least environmentally damaging, practicable alternative capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes. In conjunction with the 404(b)(1) guidelines, the Corps recommends that all projects be designed to avoid jurisdictional areas. If this is not possible, we encourage minimization of impacts to jurisdictional areas.

The Corps has concern for any project which will only provide a temporary resolution for a problem. Nor is it the policy of the Corps to piecemeal projects towards a permanent solution. Further, due to the frequency of high flows in the Salt River, the main channels are constantly changing. This would appear to be counterproductive to the proposed realignment particularly considering there is no documentation that a realignment would alleviate flooding to downstream areas.

The Corps appreciates the opportunity to review the effluent discharge study route. If you have any questions, please contact Marjorie E. Blaine at (602) 640-5385.

Sincerely,



Cindy Lester
Chief, Arizona Field Office
Regulatory Branch

Copies furnished:

Bureau of Reclamation
Phoenix Area Office
ATTN: Ms. Sandy Eto
23636 N. 7th Street
Phoenix, Arizona 85068

U. S. Fish and Wildlife Service
Arizona Ecological Services Office
ATTN: Mr. Sam Spiller
2321 W. Royal Palm Rd., Suite 103
Phoenix, Arizona 85021-4951

Arizona Game and Fish Department
Habitat Branch
ATTN: Mr. Ron Christofferson
2221 W. Greenway Road
Phoenix, Arizona 85023-4399

Arizona Department of Environmental Quality
Engineering Review and Permit Unit
ATTN: Mr. James Matt
3033 N. Central Avenue
Phoenix, Arizona 85012



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ARIZONA ECOLOGICAL SERVICES STATE OFFICE
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951



Telephone: (602) 640-2720 FAX: (602) 640-2730

December 12, 1994

In Reply Refer To:
AESO/FA

Mr. Shi-En Shiau, P.E.
Project Engineer
Greiner, Inc.
7310 N. 16th Street, Suite 160
Phoenix, Arizona 85020-2402

Dear Mr. Shiau:

This responds to your request of November 15, 1994 for our comments on the impacts on vegetation and wildlife within the area of the proposed Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant (WWTP).

The City of Phoenix is presently evaluating alternative effluent discharge routes for the WWTP. The project goal is to identify an effluent discharge route that will ensure the WWTP outfall while enhancing the quality of the adjacent Salt River and downstream properties.

The various alternative discharge routes involve the rechannelization of the present route further south in the Salt River channel from 91st to 115th Avenues. All of the new Alternatives would use the same cross section with a 20-foot bottom width, 3 to 1 slopes, and an overall width of 50 feet.

The present effluent channel provides excellent wetland and riparian habitat. These habitats support a large variety of wildlife species such as bats, skunks, raccoons, amphibians and reptiles, and a host of birds including hooded orioles, Abert's towhees, yellow and yellow-rumped warblers, red-winged blackbirds, Cooper's hawks, and various flycatchers. Many of the bird species are neotropical migrants and depend extensively on riparian communities for feeding and nesting needs. Wetland areas provide habitat for a variety of amphibian and fish species and a host of avifauna such as rails, egrets, herons, shorebirds, and waterfowl that are dependant upon this habitat type.

The study area provides wetland and riparian habitat for the following federally listed or proposed threatened or endangered species.

Yuma clapper rail (Rallus longirostris yumanensis)

bald eagle (Haliaeetus leucocephalus)

peregrine falcon (Falco peregrinus anatum)

brown pelican (Pelecanus occidentalis)

Southwestern willow flycatcher (Empidonax traillii extimus)

Riparian and wetland ecosystems are important resources nationwide. However, these ecosystems have been significantly degraded or destroyed by human activity and are much reduced in extent and disappearing at an alarming rate. It is estimated that approximately only 5% of the original riparian habitat remains along the Gila River. Riparian habitat should be afforded a high priority status in any land planning or management efforts because of their importance to fish and wildlife for biological diversity and recreational activities.

The relocation of the effluent channel could result in the loss of this valuable wetland and riparian habitat. The resultant mitigation would be costly and its success questionable.

The present channel is stable and has withstood a number of flood flows in the Salt River. The relocation of the channel further south or across the river channel would make it more susceptible to flood flows.

To protect the riparian and wetland habitats supported by the present effluent channel at the WWTP the Fish and Wildlife Service recommends the following:

1. That the effluent channel be maintained at its present location if possible. If relocation is necessary, the habitats be maintained with supplemental watering.
2. If it is determined that the effluent channel must be moved, a mitigation plan be approved by the Arizona Game and Fish Department and Fish and Wildlife Service. The plan must contain replacement of all lost habitat on at least a 2 to 1 ratio to compensate for the loss of productivity during the growth of planted vegetation.

Mr. Shi-En Shiau

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We appreciate the opportunity to work with you on this proposal. If we can be of further assistance, please contact Ron McKinstry or Don Metz.

Sincerely,



Sam F. Spiller
State Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (AES)
Director, Arizona Game and Fish Department, Phoenix, AZ



WQMS-386.033

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Fife Symington, Governor Edward Z. Fox, Director

ERP: 94-1131

December 7, 1994

Mr. Shi-En Shiau, P.E.
Greiner, Inc.
7310 N. 16th Street, Suite 160
Phoenix, AZ 85020-1891

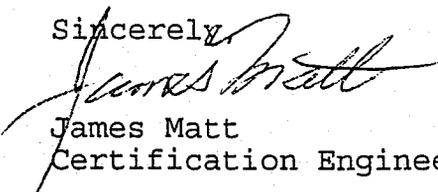
RE: Letter dated December 1, 1994 to James Matt ADEQ regarding the discharge route of the 91st Ave. Waste Water Treatment Plant (WWTP).

Dear Mr. Shiau:

We have attended your presentation of this project at the US Army Corps of Engineers Office (COE) November 8, 1994. We have discussed the project with others at ADEQ who have expertise with WWTP's and water quality impacts caused by excavating within a watercourse. The consensus is that any channelization of the Salt and Gila Rivers will be temporary because of the frequent floods that impact these watercourses. An application for an individual Section 404 Permit requires a specific statement of the project purpose and a public interest review. We do not see any reason at this time to create an artificial channel for this flow when the present channel is adequate.

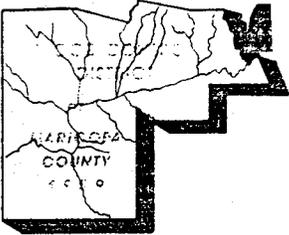
Thank you for including ADEQ in your environmental review group and for keeping us informed of your project. If you have questions or comments, please call Mr Ed Swanson at 207-4440.

Sincerely,


James Matt
Certification Engineer

JRM/jm

cc: Ed Swanson, ADEQ
Cindy Lester, COE
Madeline Goddard, COP



FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009

Telephone (602) 506-1501

Fax (602) 506-4601

TT (602) 506-5859

BOARD OF DIRECTORS

Betsey Bayless

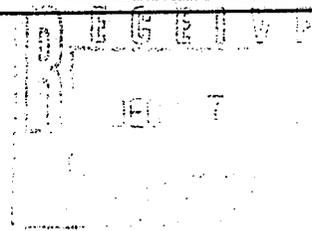
Ed King

Tom Rawles

Don Stapley

Mary Rose Garrido Wilcox

DEC 05 1994



Mr. Shi-En Shiau, P.E.
Project Engineer
Greiner, Inc.
7310 North 16th Street, Suite 160
Phoenix, Arizona 85020-2402

SUBJECT: 91ST AVENUE EFFLUENT ROUTING STUDY

Dear Mr. Shiau:

The Flood Control District has been involved in the captioned routing study since last summer. Of the five alternatives discussed on November 8, 1994, the District would give slight preference to either of the two referred to as "routed to central channel."

The District concurs with the concerns expressed at that meeting by Mr. James Matt, of the Arizona Department of Environmental Quality, Mr. Russell Haughey, of the Arizona Game & Fish Department, and Mr. Ron McKinstry of the U. S. Fish & Wildlife Service. Those gentlemen questioned the need to re-route the effluent and doubted if their respective agencies could recommend that a section 404 permit be approved for such a purpose.

In the event the effluent is re-routed, please contact Mr. Richard J. McNamara, Property Acquisition Manager regarding uses within the 1000-foot corridor right-of-way. The District would also request notification of application of the section 404 permit for the project.

As I am leaving the District at the end of the month, please address future correspondence of this project to Mr. Dave Meinhart, A.I.C.P.

Sincerely,

John Svechovsky, P.E., R.L.S.
Water Resources Planner

THE STATE



OF ARIZONA

GAME & FISH DEPARTMENT

2221 West Greenway Road, Phoenix, Arizona 85023-4399 (602) 942-3000

Mesa Office, 7200 E. University, Mesa, Arizona 85207 (602) 981-9400

Governor
Fife Symington

Commissioners:
Larry Taylor, Yuma, Chairman
Elizabeth T. Woodin, Tucson
Arthur Porter, Phoenix
Nonie Johnson, Snowflake
Michael M. Golightly, Flagstaff

Director
Duane L. Shroufe

Deputy Director
Thomas W. Spalding

December 9, 1994

Candace Huff
Greiner, Inc.
7310 North 16th Street, Suite 160
Phoenix, Arizona 85020-2402

Re: Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant

Dear Ms. Huff:

The Arizona Game and Fish Department (Department) has reviewed the Effluent Discharge Route Study for the 91st Avenue Wastewater Treatment Plant (WWTP), and we provide the following comments.

The Department's concerns fall into two areas: impacts to wildlife habitats along the Salt and Gila Rivers, and impacts to properties managed by the Department.

Impacts to Wildlife Habitats

The habitats that will be impacted by this project are significant to the area's wildlife, and are an important resource to the people of Arizona. These segments of the Salt and Gila rivers contain high-quality riparian habitat and aquatic habitat of moderate quality. These habitats support a great abundance and diversity of wildlife, which is unusual for an area so close to the Phoenix metropolitan area. To a large degree, the water discharged from the 91st Avenue WWTP supports these habitats and the biological diversity associated with the effluent channel and the Salt and Gila rivers.

Realignment of the effluent channel is expected to eliminate much of this riparian habitat until other habitat is reestablished along the new channel. The design of the new channel will greatly affect the abundance and quality of habitat that returns. The importance of riparian habitats to Arizona is reflected in Arizona Executive Order 91-6 which recognizes the unique value of riparian habitats, such as currently exists along the present effluent channel, and directs state agencies to "rigorously enforce their existing authorities to assure riparian protection, maintenance and

Candance Huff
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restoration." Further, Arizona Game and Fish Commission (Commission) policy A2.13 states that the Department will "actively encourage management practices that will result in maintenance of current riparian habitat, and restoration of past or deteriorated riparian habitats...."

Department policy I2.3, Wildlife and Wildlife Habitat Compensation, categorizes habitats based on their relative value to wildlife and outlines the Department's compensation goals. The area to be impacted would qualify as Resource Category I. The habitats in this category are of the highest value to Arizona wildlife species, and are unique and/or irreplaceable on a statewide or ecoregion basis. Our compensation goal is no net loss of existing in-kind habitat value. The policy directs us to recommend that all potential losses of existing habitat values be prevented.

A species of particular concern in this area is the Yuma clapper rail (Rallus longirostris yumanensis). This species is listed under the federal Endangered Species Act as Endangered, and is also listed as Threatened on the Department's list of Threatened Native Wildlife in Arizona. We suggest you contact the U.S. Fish and Wildlife Service Ecological Services State Office in Phoenix regarding possible impacts of this project on federally-protected species.

The Department's Heritage Data Management System has been accessed and current records show that the special status species listed below have been documented as occurring in project vicinity.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
yellow-billed cuckoo	<u>Coccyzus americanus</u>	ST,S
Yuma clapper rail	<u>Rallus longirostris yumanensis</u>	LE,ST,S

STATUS DEFINITIONS

- LE - Listed Endangered by the U.S. Fish and Wildlife Service under the Endangered Species Act. Species which are in imminent jeopardy of extinction.
- ST - State Threatened on the Department's Threatened Native Wildlife in Arizona list. Species with identified, serious threats and populations lower than they were historically and/or extremely local and small.
- S - Classified as "sensitive" by the Regional Forester when occurring on lands managed by the U.S.D.A. Forest Service.

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Impacts to the Department as a Land Manager

The Commission is one of the major landowners along the Salt and Gila Rivers west to Yuma. In this area, a number of parcels east and west of 115th Avenue are collectively managed by the Department as the Base and Meridian Wildlife Area. We are mandated to manage these lands for wildlife habitat. The alternatives presented for realignment of the effluent channel would involve construction on Commission property. For this project to go forward, the City of Phoenix would need to obtain a right-of-way from the Commission for entry onto and construction on these properties.

One of the parcels comprising the Base and Meridian Wildlife Area was purchased, and is currently managed, with federal funding from the Pittman-Robertson Federal Aid To Wildlife Restoration Act, which is administered by the U.S. Fish and Wildlife Service. Furthermore, the Department anticipates that this project will require a federal permit under Section 404 of the Clean Water Act. For these reasons, a federal nexus exists which requires compliance with the National Environmental Policy Act (NEPA).

The NEPA process results in a determination of the significance of project impacts. If those impacts are significant or cannot be reduced to a level of insignificance through mitigation, an Environmental Impact Statement is required. The Department believes that the impacts of this project on the area's wildlife and habitats would most likely be significant and adequate mitigation of these impacts would be difficult to achieve. The first question that needs to be addressed in the NEPA process is the purpose and need for this project. Because the U.S. Army Corps of Engineers would most likely be the lead agency for NEPA compliance, they would have to address this question. The City of Phoenix may want to examine this question more closely before proceeding with the required NEPA documentation and application for the right-of-way permits that would be needed for this project.

Finally, there are currently four separate planning efforts going forward that may result in a management plan for these segments of the Salt and Gila Rivers. They are the Maricopa Association of Governments Salt/Gila Master Plan, the U.S. Army Corps of Engineers Rio Salado Reconnaissance Study, the analysis being conducted by the Bureau of Reclamation for determining the disposition of the effluent from the 91st Avenue WWTP (this includes the planning for the Tres Rios Project), and the flood control study being conducted by the Maricopa County Flood Control District for these portions of the Salt and Gila Rivers. We suggest that the needs of the residents in the Holly Acres area be addressed in these planning efforts to ensure that comprehensive planning for the Salt and Gila rivers is done in a coordinated manner.

Considering the comments provided above, the Department supports no change in the current alignment of the channel at this time.

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Thank you for the opportunity to comment on this project. If you have any questions concerning this issue, please contact me at 981-9400, extension 222.

Sincerely,



Russell A. Haughey
Habitat Program Manager
Mesa Region

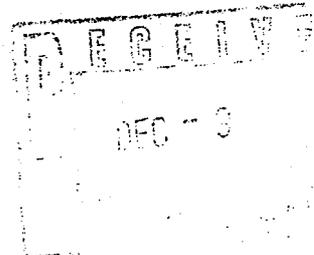
RAH:rh

cc: Kelly Neal, Region VI Supervisor
Dave Walker, Habitat Branch
Sue Morgensen, Habitat Branch,
Marc Dahlberg, Fisheries Branch
Tom Hildebrandt, Region VI Wildlife Program Manager
Mark Stewart, District Wildlife Manager
Sam Spiller, U.S. Fish and Wildlife Service, Ecological
Services State Office, Phoenix
Paul Kinshella, P.E., Superintendent, City of Phoenix, Water
Services Department, Wastewater Engineering Division, 200
West Washington Street, 8th Floor, Phoenix, Arizona
85003-9913



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DEC 07 1994



Mr. Shi-En Shiau, P.E.
Project Engineer
Greiner, Inc.
7310 N. 16th Street, Suite 160
Phoenix, AZ 85020-2402

Dear Mr. Shiau:

In response to your November 15, 1994 letter to Jacques Landy requesting comments and suggestions on the impact of alternate effluent discharge routes for the 91st Avenue Wastewater Treatment Plan. Our understanding is that this project is being undertaken in part due to problems with vector control. While we understand the importance of insect control, the proposed solution by rechannelization of the effluent discharge route may not be the only option. We believe that given the plans the City of Phoenix and Bureau of Reclamation are considering for the use of constructed wetland to treat the effluent within the next few years, it may be premature to consider moving the channel at this time. In addition, there may be other options for insect control that would be just as effective without requiring moving the effluent channel.

A major concern with the proposed rechannelization options has to do with the impacts to existing habitat including riparian habitat from moving the effluent discharge channel. There is not enough information on the existing habitat to evaluate the impacts of the various options. One alternative which may help to address this concern would be to discharge the denitrified effluent which is one third of the total flow to the existing discharge channel. This lesser flow may still be adequate to support the existing riparian habitat but possibly small enough to prevent water logging of adjacent property. The remainder of the flow could then be directed to the central channel as shown on your "split effluent flow" option. However, an evaluation of the existing riparian habitat would be necessary to fully analyze this option and the other options proposed. This evaluation should also probably include a determination of whether any vegetation that results in the redirected channels will contribute to flooding during storm events.

Finally, any rechannelization of the flow that occurs within waters of the United States may require a Corps of Engineers Section 404 permit. Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. The basic premise of the Section 404 program is that no discharge of dredged or fill material can be permitted if there is a practicable alternative that is less damaging to the aquatic environment or if the discharge would result in significant degradation of the Nation's waters. An applicant must first demonstrate that steps have been taken to avoid wetlands impacts where it is practicable. In addition, applicants are required to minimize potential impacts to wetlands and waters, and finally to provide compensation for any remaining unavoidable impacts through mitigation activities. You should keep this in mind when developing your options and contact the US Army Corps of Engineers early in the process.

I hope this information is useful to you in resolving this matter. If you have any questions, please contact either me at (415) 744-1968 or Jacques Landy at (415) 744-1880.

Sincerely,



Stephanie L. Wilson
Wetlands Planning Coordinator
So. California, Arizona, Nevada Watersheds
Protection Section

cc: Jacques Landy, W-5-1
Terry Oda, W-5-1
Alisa Greene, W-3-2
James Romero, W-3-3

APPENDIX C
Public Comments and Questions



Public Meeting #1 was held Monday, August 15, 1994 from 5:00 p.m. to 8:00 p.m. Questionnaires were provided to gain an insight into some of the public's concerns and questions. Below are the responses received from the public at the Open House. Also enclosed is the questionnaire used to solicit these responses. Each response is numbered and the number corresponds to one person. For example, response #1 for each question is from the same person. The people who requested 8 x 10 duplicates of the poster boards were provided the information by mail. A total of 5 questionnaires were returned and 17 people attended the Open House. The responses were compiled verbatim from the returned questionnaires.

Question #2: Do you like the way the open house was organized? If not, do you have any suggestions to improve future meetings?

Responses: #1: "I liked the open house organization and having people available to discuss issues. I would like to see proposals for alternative routes and the pros and cons for each proposal. Please include costs, risks & benefits. I do not support the discharge near the Agua Fria River and Camelback - Indian School Roads proposal."

#2: "You should put signs about the meeting at the Circle K at 115 Ave. & Southern posting the meetings."

#3: "Fine. An 8 x 10's paper pkg. of the placards would be nice to take home."

Question #3: If you have a question that was not addressed at tonight's open house, write it below. If you would like a project team member to follow-up with you in response to your question, please provide your telephone number below.

Responses: #1: "Please refer to above. Also, I am interested in pursuing use of the APS Nuclear Plant pipeline to deliver effluent to farmers or others who could use it. Phone number provided."

#2: "I am concerned over the terrible odors. I live 1/2 mi. west of the plant and have live there for 42 yr. I'm trying to sell my property but when I tell them about the odors, it scares them away."
Phone number provided.

#3: No response. Phone number provided.



**EFFLUENT DISCHARGE
ROUTE STUDY
AT THE
91ST AVENUE
WASTEWATER
TREATMENT PLANT**

We need your input!

Thank you for attending tonight's open house. The purpose of the open house has been to provide you the opportunity to learn about, express your thoughts and discuss the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant. Your comments and ideas are important and will help us focus the project's design.

Please take a moment to complete this comment sheet before you leave or mail it in at a later time. By doing this, you are helping us make certain your comments and suggestions are considered and addressed in the design studies.

1. If you are interested in attending future Public Meetings concerning this project, please provide your name and address and you will be notified.

2. Do you like the way the open house was organized? If not, do you have any suggestions to improve future meetings?

3. If you have a question that was not addressed at tonight's open house, write it below. If you would like a project team member to follow-up with you in response to your question, please provide your telephone number below.

Telephone number: _____

Thank you for attending the open house and for taking the time to record your questions and comments.

Project Consultants: Greiner, Inc.



Public Meeting #2 was held Tuesday, October 11, 1994 from 7:00 p.m. to 8:30 p.m. Questionnaires were provided to gain an insight into some of the public's concerns and questions. Below are the responses received from the public at the Presentation. Also enclosed is the questionnaire used to solicit these responses. Each response is numbered and the number corresponds to one person. For example, response #1 for each question is from the same person. A total of 3 questionnaires were returned and 16 people attended the Open House. The responses were compiled verbatim from the returned questionnaires.

Question #2: Do you like the way the presentation was organized? If not, do you have any suggestions to improve future meetings?

Responses: #1: "Yes."

#2: "The meeting was informative."

#3: "Have speaker who speaks pronounce their words more clearly."

Question #3: If you have a question that was not addressed at tonight's presentation, write it below. If you would like a project team member to follow-up with you in response to your question, please provide your telephone number below.

Responses: #1: "During the temporary wetlands project, what is being done to control insects?"
Phone number provided.

#2: "Would appreciate being notified of public meetings. Sign up at meetings but didn't know about this meeting until this afternoon."

#3: "Lighting. You can't see when look to the east. We were told prior to 1980 i.e. survey trees would be planted around the plant."
Phone number provided.

Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant



We value your comments!

Thank you for attending tonight's presentation. The purpose of the presentation has been to provide you the opportunity to learn about, express your thoughts and discuss the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant. Your comments and ideas are important and will help us focus the project's design.

Please take a moment to complete this comment sheet before you leave or mail it in at a later time. By doing this, you are helping us make certain your comments and suggestions are considered and addressed in the design studies.

1. If you are interested in attending future Public Meetings concerning this project, please provide your name and address and you will be notified.

2. Do you like the way the presentation was organized? If not, do you have any suggestions to improve future meetings?

3. If you have a question that was not addressed at tonight's presentation, write it below. If you would like a project team member to follow-up with you in response to your question, please provide your telephone number below.

Telephone number: _____

Thank you for attending the presentation and for taking the time to record your questions and comments.

Project Consultants: Greiner, Inc.

Greiner

PUBLIC MEETING #3 COMMENT SUMMARY

Public Meeting #3 was held on Thursday, November 17, 1994 at 7:00 p.m. It was attended by 13 individuals including representatives from the Neighborhood Citizens Committee, private citizens and Buckeye Irrigation District. Comment and questionnaire forms were made available to the public, but none were completed and returned. However comments were provided during the presentation by those in attendance.

The primary focus of the meeting was discussion of the regulatory impacts associated with rechannelization of the effluent discharge. The focus of the citizens group concerned rechannelization to a more southerly route.

Comments included:

1. Improving the quality of life in the area by moving the channel.
2. The wetlands and riparian habitat within the boundaries of the project should be preserved.
3. The creation of wetlands out of the U.S. Army Corps of Engineers jurisdictional boundaries. The location discussed was on the north side of the Salt River, between 99th Avenue and 107th Avenue, with the construction of a dike between the river and the discussed wetlands.
4. Planting of fish within the riparian habitat to help eat mosquitos that may breed in ponded and backwater areas.
5. Improvement of the existing area through construction of a wetlands, fishing holes, bike and equestrian trails for public use.

Greiner

Effluent Route Discharge Study at the 91st Avenue WWTP **PUBLIC MEETING #4 COMMENT SUMMARY**

The final Public Meeting #4 was held on Thursday, March 16, 1995 at 7:00 p.m. It was attended by 14 individuals including representatives from the Neighborhood Citizens Committee, private citizens and the Flood Control District of Maricopa County. Questionnaires were made available to the people in attendance to gain an insight into some of the public's comments and questions. Below are the questionnaire responses received from the public at the presentation as well as verbal comments made by those in attendance. Also enclosed is a copy of the questionnaire used to solicit these responses. The questionnaire was also used as a means to generate a list of those citizen's expressing interest in obtaining a copy of the final Conceptual Report for this study.

The primary focus of the meeting was to summarize the project history and present the findings and conclusions of the study.

Question #1: Three people in attendance gave their name and address indicating that they would like to receive a copy of the final report (see attached list).

Question #2: No responses

Question #3: One attendee responded with the following verbatim response:

"Who's paying for this? Besides lawsuit money. Why does this have to take so long? Keep me informed on future plans and meetings."
Phone number provided.

Verbal comments included:

1. What is being done about the shooting problems in the area?
2. What alternatives, technologically speaking, are available to improve the efficiency of the plant in reducing BOD and suspended solids?
3. Is the constructed wetlands alternative a possibility? And why not sell water coming out of the wetlands for irrigation to recover the costs?
4. Will the Indian Community be opposed to having the construction of a dike along the north side of the river incorporated into the constructed wetlands alternative?
5. Has the constructed wetlands alternative been recommended by the Citizens' Committee?

Greiner

Effluent Route Discharge Study at the 91st Avenue WWTP **PUBLIC MEETING #4 COMMENT SUMMARY**

The following citizens have requested a copy of the final Conceptual Report:

- 1.) Diana Dewill Odom Carter and Doug Carter
P.O. Box 141
Tolleson, AZ 85353

- 2.) Robert T. Donahue
10520 W. Flower Street
Avondale, AZ 85323

- 3.) George L. Mothershed
10820 North 36th Street
Phoenix, AZ 85284-3315

- 4.) Ira Schwed
10745 W. Pecan Road
Tolleson, AZ 85353

Effluent Route Discharge Study at the 91st Avenue Wastewater Treatment Plant



We value your comments!

Thank you for attending tonight's presentation. The purpose of the presentation has been to provide you the opportunity to learn about, express your thoughts and discuss the Effluent Discharge Route Study at the 91st Avenue Wastewater Treatment Plant. Your comments and ideas are important and will help us focus the project's design.

Please take a moment to complete this comment sheet before you leave or mail it in at a later time. By doing this, you are helping us make certain your comments and suggestions are considered and addressed in the design studies.

1. If you are interested in receiving a copy of the final Conceptual Report for this project, please provide your name and address below.

2. Do you like the way the presentation was organized? If not, do you have any suggestions to improve future meetings?

3. If you have a question that was not addressed at tonight's presentation, write it below. If you would like a project team member to follow-up with you in response to your question, please provide your telephone number below.

Telephone number:

Thank you for attending the presentation and for taking the time to record your questions and comments.
