Final

Environmental Impact Statement

Greater Globe–Miami, Arizona Wastewater Treatment Project

April 1976

UNITED STATES · ENVIRONMENTAL PROTECTION AGENCY

U.S. Environmental Protection Agency

FINAL ENVIRONMENTAL IMPACT STATEMENT

GREATER GLOBE-MIAMI
WASTEWATER TREATMENT PROJECT

EPA-9-AZ-GILA-Globe-Regional WWTP-76
April 30, 1976

Prepared By
U. S. Environmental Protection Agency
Pacific Southwest Region IX
100 California Street
San Francisco, CA 94111

With Technical Assistance By
Jones & Stokes Associates, Inc.
455 Capitol Mall, Suite 835
Sacramento, CA 95814

In Association With
Don Owen & Associates
and
Gruen Gruen + Associates

RESPONSIBLE OFFICIAL:

L Russell Freeman, Deputy
Paul De Falco, Jr.
Acting Regional Administrator
Environmental Protection Agency
Region IX

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SUMMARY

ENVIRONMENTAL IMPACT STATEMENT

Draft ( )

Final (x)

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Prepared by: United States Environmental Protection Agency
Pacific Southwest, Region IX
San Francisco, California 94111

Type of Action: Administrative

Date Available to CEQ and the Public: May 1976

Description of Project

This Final Environmental Impact Statement (EIS) encompasses the description and evaluation of eight viable wastewater treatment facilities plans to provide modern, comprehensive wastewater treatment and disposal for the Globe-Miami area, Gila County, Arizona. From among these plans, the alternative expanding the aerated lagoon treatment and percolation pond disposal systems at the existing Globe and Miami treatment sites is recommended as most suitable for the region.

The character and content of planning for regional wastewater management programs and the environmental setting for this area are presented in this EIS. These conditions establish the basis for determining and evaluating alternative wastewater treatment and disposal systems. Nine alternative projects, including the no action alternative, are considered, and they include both regional and sub-regional sewage treatment systems which are evaluated from both environmental and economic viewpoints.

Analysis of the environmental, social and economic effects of the alternatives resulted in Alternative 2A being recommended as the most cost-effective and least environmentally damaging. Alternative 2A uses the existing Globe and Miami treatment sites to provide treatment and disposal to these two incorporated areas through a system of aerated lagoons and percolation ponds. Raw sewage from Globe, Miami and serviceable unincorporated areas would be conveyed by gravity flow from the major collection systems to the treatment sites. The existing City of Globe, Cobre Valley Sanitary District plant would be retained in service as would other small treatment plants now operating in the area. These individual plants may connect to either the City of Globe or Town of Miami sewerage systems by agreement with an incorporated entity. The recently-constructed interceptor would be abandoned. Treated effluent would be discharged into ponds where it would percolate into the groundwater system. Groundwater in this area mixes with the subterranean flow moving north to the Salt River. Alternative 2A has a 20-year period 1976 present worth of $2,499,800. The sewage treatment and disposal needs of the incorporated and local improvement district areas could be served until beyond 1990.

Impacts of Project

Environmental impacts will occur during implementation of the treatment plants and sewage conveyance systems. Except for impacts associated with construction activities, most impacts are not common to all alternatives because of different facilities locations and treatment processes. The major direct adverse environmental effects among all alternatives are related to soil disturbances and the discharge of treated wastewater; groundwater surfacing in Alternatives 1C, 2A and 5; nuisance insect production in Alternatives 1B, 1C, 2A, 2B and 3; and land use conversions in Alternatives 1A, 1B, 1C and 3. Energy consumption is highest in Alternatives 1A, 2B and 4; and capital construction and operational costs are highest in Alternatives 1A, 1B and 4. Alternative 2A is judged to have the least adverse impact on local residents.

Secondary environmental impacts relating to growth will occur. A considerable part of the service area is presently sewered, but new collection systems will eventually service most of the incorporated area. Annexation or the formation of local improvement districts is expected to expand the service area. Population growth inducement will probably occur as a result of the project in areas where the lack of suitable sewerage is presently a constraint. Growth has been constrained because sewage treatment and disposal is in violation of state and federal standards. Other secondary effects (i.e., increased energy and resource consumption, increased traffic, decreased air quality and land use conversions) will occur with population growth.

In addition to the mitigation of aesthetic degradations and potential hazards to public health, the major beneficial impacts that result from improving and upgrading sewage treatment and disposal are more orderly growth and economic development, any resultant increased employment, and compliance with current water pollution control plans and standards.

Alternatives

Nine alternatives and sub-alternatives, including the present sewage treatment plants (no action), were described, evaluated and discussed in this draft EIS. They are:

Alternative

- 0 Retention of the existing wastewater treatment and disposal systems.
- 1A A regional activated sludge treatment plant located near the confluence of Miami Wash and Pinal Creek with disposal of the treated effluent to the copper industry.
- 1B A regional activated sludge treatment plant located near the confluence of Miami Wash and Pinal Creek with disposal by spraying on U. S. Forest Service land.
- 1C A regional activated sludge treatment plant located near the confluence of Miami Wash and Pinal Creek with direct disposal to Pinal Creek.
- 2A Aerated lagoons located at the existing Miami and Globe treatment plant sites with disposal to percolation ponds.

2B Aerated lagoons located at the existing Miami and Globe treatment plant sites with disposal by spraying on U. S. Forest Service land.

3 A regional aerated lagoon treatment plant located near Pringle Springs with disposal to percolation ponds.

4 A regional activated sludge treatment plant located on Inspiration Consolidated Copper Company property with either reuse by the copper company or disposal to adjacent company lands.

5 A regional aerated lagoon treatment plant located near the existing Miami treatment plant with disposal to percolation ponds.

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FEDERAL AGENCIES

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Office of External Relations

Council on Environmental Quality
722 Jackson Place, NW
Washington, D. C. 20006

Department of the Interior
Pacific Southwest Region
P. O. Box 36098
450 Golden Gate Avenue
San Francisco, CA 94102

Department of Health, Education and Welfare
Region IX
50 Fulton Street
San Francisco, CA 94102

U. S. Army Corps of Engineers
Attn: Garth A. Fuquay
Chief, Engineering Division
P. O. Box 2711
Los Angeles, CA 90053

U.S.D.A. - Soil Conservation Service
Attn: John W. Peterson
Federal Building, Room 6029
230 North First Avenue
Phoenix, AZ 85025

STATE AGENCIES

Arizona Department of Health Services
Bureau of Water Quality Control
1740 West Adams Street
Phoenix, AZ 85007

State Clearinghouse
3003 North Central Avenue, Suite 1707
Phoenix, AZ 85012

Arizona Department of Transportation
Highways Division
Attn: Mason J. Toles
206 South Seventeenth Avenue
Phoenix, AZ 85007

Northern Arizona Council of Governments
P. O. Box 57
Flagstaff, AZ 86001

Salt River Project
1521 Project Drive
Tempe, AZ 85281

LOCAL AGENCIES

Gila County Board of Supervisors
P. O. Box 1043
Globe, AZ 85501

City of Globe
Attn: Mayor G. M. Williams
150 North Pine
Globe, AZ 85501

City Council
City of Globe
150 North Pine
Globe, AZ 85501

Lionel Blair, City Manager
City of Globe
150 North Pine
Globe, AZ 85501

Ms. Katie Weimer
Mayor, Town of Miami
500 Sullivan Street
Miami, AZ 85539

Gene Miller, City Manager
Town of Miami
509 Sullivan Street
Miami, AZ 85539

Town Council
Town of Miami
500 Sullivan Street
Miami, AZ 85539

LEGISLATORS

Honorable Barry Goldwater
U. S. Senate
Washington, D. C. 20515

Honorable Paul J. Fannin
U. S. Senate
Washington, D. C. 20515

Honorable John J. Rhodes
U. S. House of Representatives
Rayburn House Office Building
Washington, D. C. 20515

Honorable Sam Steiger
U. S. House of Representatives
Cannon House Office Building
Washington, D. C. 20515

Honorable Morris K. Udall
U. S. House of Representatives
Longworth House Office Building
Washington, D. C. 20515

Honorable John B. Conlan
U. S. House of Representatives
Cannon House Office Building
Washington, D. C. 20515

Honorable A. V. Hardt
State Senator, Gila County
12 North Broad Street
Globe, AZ 85501

Honorable Paul Castro
Governor, State of Arizona
1700 West Washington
Phoenix, AZ 85007

Honorable Edward D. Guerrero
House of Representatives
House Wing, Capitol Bldg.
Phoenix, AZ 85007

PUBLIC INSPECTION LOCATIONS

Charles W. Buster
Associate Editor
Arizona Silver Belt
P. O. Box 31
Globe, AZ 85501

The Arizona Republic Newspaper
120 East Van Buren
Phoenix, AZ 85004

Library
Old Dominion Library
Globe, AZ 85501

Linda K. Verges, Librarian
Arizona Office of Economic Planning
and Development
Phoenix, AZ 85007

CONCERNED INDIVIDUALS AND ORGANIZATIONS

Dr. C. A. Bejarano
Superintendent of Public Works
Gila County
P. O. Drawer L
315 East Broad Street
Claypool, AZ 85532

C. T. Brown, General Manager
Cities Service Company
Box 100
Miami, AZ 85539

Stephen L. Bixby
P. O. Box 311
Globe, AZ 85501

John Carollo Engineers
Attn: Don Priesler
3308 North Third Street
Phoenix, AZ 85012

Dr. Robert Gumerman
Don Owen & Associates
2232 SE Bristol, Suite 206
Newport Beach, CA 92707

Dr. Charles R. Hazel
Jones & Stokes Associates, Inc.
455 Capitol Mall, Suite 835
Sacramento, CA 95814

Johnson, Shelley and Roberts
Attn: J. Lamar Shelley
48 North MacDonald Street
Mesa, AZ 85201

J. G. Kuhn
Inspiration Consolidated Copper Company
Inspiration, AZ 85537

Hal Marron
4532 Birchwood
Seal Beach, CA 90740

Roberta Mundie
Gruen Gruen + Associates
564 Howard Street
San Francisco, CA 94105

Pace Engineering, Inc.
55 East Weldon
Phoenix, AZ 85012

Mitchel D. Platt
Platt and Platt
P. O. Box 398
St. Johns, AZ 85936

Phil Sawaia
Box 3
Globe, AZ 85501

John W. Stansel
Toups Corporation
4131 North 24th Street
Phoenix, AZ 85016

Ms. Julia Steinke
Box 172
Miami, AZ 85539

Douglas MacKay
918 North Aurora
Ithaca, NY 14850

Eva Marie Setka and Family
P. O. Box 1081
Globe, AZ 85501

Laurie J. Vitt
Office of Research Grants
and Contracts
Arizona State University
Tempe, AZ 85281

David E. Creighton, Jr.
P. O. Box 1548
Phoenix, AZ 85001

Annie S. Koury
615 West Florida
Holbrook, AZ 86025

Edward Koury
3 Heather Road
Elliott, ME 03903

Bob Hampton
Patio Park Mobile Home Park
Claypool, AZ 85532

Mr. George Larson, Councilman
691 Monroe
Globe, AZ 85501

Mr. Luis Aguirre, Councilman
136 Haskins Road
Globe, AZ 85501

Mr. George B. Ollson, Councilman
P. O. Box 534
Globe, AZ 85501

Mr. Lynn M. Sheppard
County Supervisor
P. O. Box 2625
Globe, AZ 85501

Donald E. Weaver, Jr.
James Schoenwetter
Department of Anthropology
Arizona State University
Tempe, AZ 85281

I. INTRODUCTION

Purpose and Objectives

The National Environmental Policy Act of 1969 (NEPA) requires all federal agencies which propose actions that would significantly affect the quality of the human environment to prepare an Environmental Impact Statement (EIS) on these actions. The EIS is intended to be a "full disclosure" of impacts which would result from a project or action, and must follow specific guidelines established by the Council on Environmental Quality (CEQ). In the selection of a wastewater facilities plan, it is not the intent of NEPA that alternatives be evaluated and a plan selected or rejected on the basis of environmental considerations alone, but rather that the planning process consider all significant environmental, social, and monetary costs.

Because the Greater Globe-Miami regional wastewater project can be 75 percent funded by the Environmental Protection Agency (EPA) as a part of the Construction Grants Program authorized by the Federal Water Pollution Control Act amendments of 1972 (P.L. 92-500), it requires NEPA action. After consideration of environmental, social and cost impacts, it was decided by EPA to prepare an EIS that would encompass all wastewater treatment and disposal alternatives that seem appropriate for the area.

The EIS objective is to resolve issues of public controversy that have arisen from the previously proposed Globe-Miami project. This EIS, following the guidelines of the NEPA, will objectively evaluate all feasible combinations of project alternatives and determine which is considered the recommended project. All relevant monetary, social and environmental effects will be included in the analysis.

Data for this EIS has been compiled from various existing studies of the Globe-Miami area, numerous personal conversations with involved individuals and additional studies conducted by the EIS consultant. A complete listing of references is in the Bibliography.

The EIS process encourages public input into the decision-making process. This EIS was prepared in draft form and widely circulated for public comment. Announcements in the local press and a public hearing were used to solicit responses. After a 45-day public comment period, all replies were addressed and the final decision of a recommended project is published in this Final Environmental Impact Statement.

Area Affected

The regional setting for the Greater Globe-Miami wastewater project is Gila County, Arizona, about 90 miles east of Phoenix and located as shown in Figure 1. (A detailed description of the area is given in the chapter covering ENVIRONMENTAL SETTING).

Present Situation

Sewage treatment for Globe and Miami is presently provided by raw sewage lagoons, an activated sludge plant for the Cobre Valley Sanitary District, individual treatment plants for a shopping center, hospital, trailer park and school, and septic tanks in unincorporated areas. The sewage lagoons serving Globe and Miami are totally inadequate to handle present loads and furthermore, they do not comply with P.L. 92-500 and EPA regulations which require secondary level treatment by 1977. In addition to not complying to EPA regulations and being environmentally unacceptable for aesthetic and public health reasons, the inadequacies probably affect growth in the two communities.

Except for the unincorporated residential and business developments connected to the Cobre Valley Sanitary District treatment plant near Central Heights, individual units are in use, many of which are reportedly inadequate. The matter of maintenance of individual systems and disposal of septic wastes is a continuing problem. Numerous complaints relating to septic tank failures have been made to the County Department of Public Health. Soil conditions in upland areas are often undesirable for septic tanks because of high clay content, depth and slope.

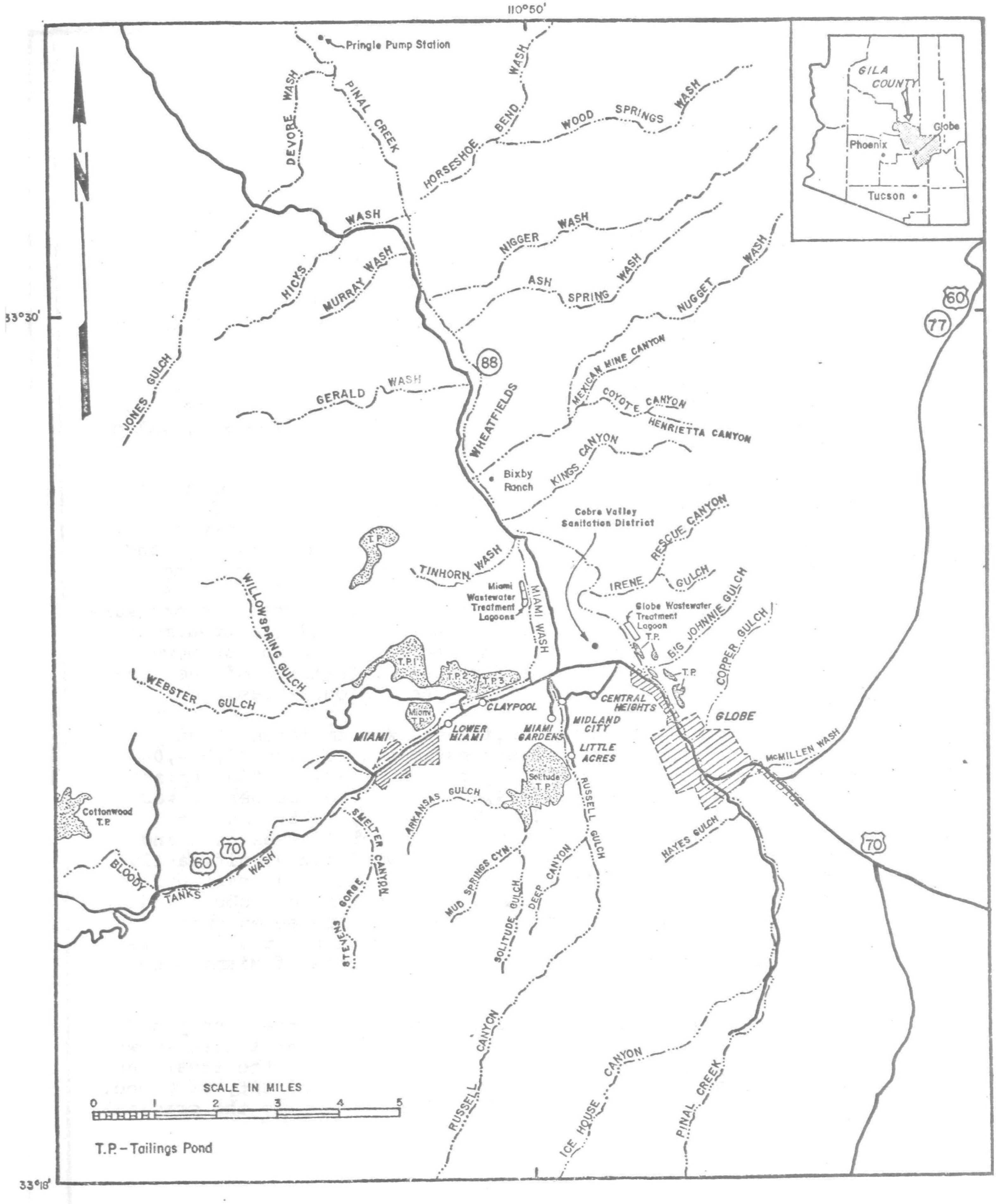


FIGURE I: STUDY AREA

Background

Problems engendered by sewage were under community consideration for some time before 1972. By resolution of their governing bodies in 1972, the City of Globe, County of Gila, Town of Miami and Cobre Valley Sanitary District agreed to enter into intergovernmental contracts to participate in the costs and benefits of a sewerage project to be known as the Greater Globe-Miami Wastewater Project. The City of Globe is the lead agency.

Subsequent to these community decisions, the Inspiration Consolidated and Cities Service Copper Companies, by letter, tentatively agreed to participate on a limited basis by using treated wastewater in their operations.

The foregoing agency actions relate to data and information contained in two wastewater facilities plans prepared by John Carollo Engineers. Their Globe-Miami area wastewater report (1971) encompasses a study of the area's sewerage and sewage disposal situation with recommendations concerning regional organization, a grant application and facilities including gravity trunk sewers, the outfall sewer, two pressure mains, three lift stations and an activated sludge treatment plant. The 1972 report concerns the determination of sewer improvement districts, costs for special features of the project, and a breakdown of costs to the various areas.

An application for federal assistance was implemented on October 31, 1972, for a project estimated to cost $3,964,000 with the shared costs amounting to: EPA, $2,973,000; Arizona, $396,400; and applicants, $594,600. The project period was to be from November 2, 1972 to November 5, 1975. During December 1972, EPA prepared an Environmental Assessment and determined that the proposed project "will not significantly affect the quality of the human environment". A grant offer according to the application was made by EPA to Globe. Additional planning and design of the project proceeded during 1973-75 and the Phase I interceptor was constructed from the present Globe sewage lagoon to the confluence of Miami Wash and Pinal Creek.

During 1973-74, actions on the part of Miami, the County and individual residents of the lower Pinal Creek area also known as Wheatfields, have caused withholding work on the treatment plant portion of the project implemented by the City of Globe. In the period before October 1973, the parties to the original agreement for the wastewater project were unable to come to contractual understanding, and Miami and Gila County ceased to participate in the project. By resolution Globe decided to proceed alone and the Cobre Valley Sanitary District decided to join with Globe. Miami retained a sanitary engineering consultant to study the situation and advise them as to their best course of action to alleviate their violation of EPA regulations.

At least one public meeting on the Greater Globe-Miami project had been conducted by the City of Globe -- January 31, 1973; however, the text of the minutes of the meeting indicates that it was called "to acquaint major firms in the area with the status of the areawide sewage plans" (Anderson, 1974).

Since 1973, several significant events have occurred which resulted in the cessation of the project and the preparation of this environmental statement. In July citizens living in the vicinity of and north of the proposed wastewater treatment plant site (Wheatfields), located near the confluence of Miami Wash and Pinal Creek, objected to this location, to the lack of public hearings on the project and to certain technical matters. Dr. C. A. Bejarano wrote EPA (July 19, 1974) to explain his concerns and Mr. Stephen L. Bixby, Dr. Bejarano, et.al., filed a complaint in the Superior Court of Arizona to enjoin proceeding with the treatment plant at the proposed location.

Subsequently, the Arizona Department of Health Services issued a notice of public meeting to be held on November 22, 1974, in the City Hall of Globe, Arizona, to obtain comments and opinions on the proposed location of the Globe wastewater treatment facility. Mr. Bixby and Dr. Bejarano read statements of their concerns at this meeting.

The comments of a member of the County Board of Supervisors, Lynn Sheppard, regarding the treatment plant location were sent to the Arizona Department of Health Services (ADHS) on November 24, 1974. This letter pointed out that a petition containing about 300 names of residents living north of the site was presented to the County Board of Supervisors protesting the plant location. Supervisor Sheppard was concerned with the effects of this location on future growth and liability for damage suits.

The complaint of Mr. Bixby, et.al., was heard in the Gila County Superior Court and found that EPA regulations had been violated; however, an injunction was not granted for the reason that EPA was an indispensible party to the action. Mr. M. D. Platt, Attorney for Mr. Bixby, wrote EPA requesting that they at least withhold further work on the project.

On March 10, 1975, EPA notified the Mayor of the City of Globe that further construction grants would be withheld and that EPA would prepare an Environmental Impact Statement. In June 1975, EPA cited to the ADHS the issues that must be resolved before proceeding with the Greater Globe-Miami wastewater project. In August the city was authorized to proceed with the Phase II interceptor because it did not influence the treatment facility type or location, but with the provision that no new services could be connected.

In September 1975 a contract was let by EPA to Jones & Stokes Associates, Inc., of Sacramento, California, to prepare the Environmental Impact Statement in a 30-week period. An Official Notice of Intent to prepare an Environmental Impact Statement was sent by EPA, using OMB-A-95 procedures, to all interested governmental agencies, public groups and concerned individuals on October 28, 1975.

The Draft Environmental Impact Statement was distributed in January 1976. A public hearing was held in two sessions on February 18, 1976 in Globe, Arizona. The transcript of these hearings and written comments on the Draft Environmental Impact Statement received by EPA were considered and responded to in this Final Environmental Impact Statement. Alternative 3 was selected as the recommended regional plan in the Draft Environmental Impact Statement. As a result of information supplied to EPA during the Draft Environmental Impact Statement review period, the recommended facilities plan was changed to Alternative 2A. The reasons for this change are stated in Chapter V.

No administrative action will be taken by EPA during the 30 days following the publishing and distribution of this Final Environmental Impact Statement. EPA considers this document to describe the project eligible for 75 percent federal funding under PL 92-500. The EPA may supplement or amend the environmental statement sometime in the future if substantial changes are made in the proposed action or significant new information becomes available concerning its environmental aspects.

II. ENVIRONMENTAL SETTING

General Features

Location

The Globe-Miami area is located about 90 miles east of Phoenix on Highway 60 (Figure 1). This area is surrounded by the Tonto National Forest and the San Carlos Indian Reservation. Globe and Miami are incorporated while other communities shown in Figure 1 are not. Most residential and commercial development borders the major highways and county roads. The Inspiration and Cities Service Copper Companies are the major land owners and employers in the area. The elevation range is from 3,000 to 4,500 feet. Most of the area is drained by Pinal Creek, located in the Salt River basin; however, a portion of the City of Globe drains southeasterly to the Gila River.

Climate

The climate of Globe and Miami is characterized by hot summers and cool winters. Climatological data for Globe and Miami are shown in Table 1. The slight difference in climate between the two cities, which are separated by a low ridge, is probably due to influences from bordering basins. Precipitation occurs chiefly in two seasonal periods, July 1 through September 30, and November 15 through April 15. During spring and fall, precipitation is normally light (Earl V. Miller Engineers, 1975). Summer storms are usually local in origin; whereas, winter storms are large frontal systems that distribute moisture over a large area. Snow occurs, but rarely stays for more than a couple of days.

The prevailing wind direction is from the southwest, although a southeast wind often accompanies summer storms. Night-time thermal inversions are common.

Air Quality

The Globe-Miami area is in the Phoenix-Tucson Interstate Air Quality Control Region. Sulfur dioxide and particulate matter are monitored in Miami, Inspiration Copper Company property and on Jones Ranch, located about one mile south of Miami.

Table 1

AVERAGE TEMPERATURE AND PRECIPITATION
FOR GLOBE AND MIAMI, ARIZONA

	Globe		Miami	
	Temp.	Precip.	Temp.	Precip.
January	42.8	1.58	44.1	2.07
February	46.9	1.36	47.9	1.83
March	52.4	1.28	53.6	1.72
April	60.2	0.60	61.9	0.77
May	68.0	0.28	70.4	0.29
June	77.0	0.40	79.7	0.32
July	82.8	2.22	83.8	2.34
August	80.1	2.86	81.3	3.30
September	75.1	1.26	77.0	1.46
October	63.6	1.08	65.8	1.14
November	50.7	0.84	52.6	1.15
December	44.6	1.61	46.8	2.11
Annual Mean	62.0	15.37	63.7	18.47
Extremes - High	111	--	108	--
Low	18	--	25	--

Source: Modified from U. S. Department of Commerce, 1974.

Temperature inversions may for short periods prevent the dispersion of pollutants, allowing concentrations of particulate matter and sulfur dioxide to occasionally violate air quality standards. The relatively high particulate matter concentrations are primarily due to wind-blown dust from the southwest desert area, unpaved roads, and mining operations (Earl V. Miller Engineers, 1975). Sulfur dioxide pollution is due to the copper smelting operation of the Inspiration Consolidated Copper Company which also does smelting for other copper companies. Vehicles are not a major source of air pollution in this area. Traffic load (ADT) may amount to 17,000 cars per day. 1973 and 1974 air quality data and state standards for the Globe-Miami area are shown in Table 2. The data in Table 2 does not reflect the present degree of pollution controls in operation at the smelter. These new controls are expected to prevent violation of the sulfur dioxide standards.

Topography

The Greater Globe-Miami Wastewater Project lies within a broad zone of nearly parallel mountain ranges extending diagonally across Arizona from the southeast corner northwestward to the Colorado River (Peterson, 1962). This Mountain Province which is 60 to 100 miles wide, contains most of the large base metal deposits in Arizona. The study area topography is shown in Figure 2. The mountainous area between Pinal and Pinto Creeks, a northwest continuation of the Pinal Mountains, is the location of major copper mines. The Pinal range is characterized by steep, narrow canyons and rugged peaks, e.g., Pinal Peak (7,850 feet). Slopes range from 5 to 70 percent.

Pinal Creek is the principal stream. Surface flow is intermittent to ephemeral for most of its length, with flows occurring following a heavy rain or snowmelt. There are many tributary washes to Pinal Creek; Miami Wash, Russell Gulch, Webster Gulch, Tinhorn Wash, Miami Wash and Gerald Wash. Surface flow in washes occurs only during and shortly after storms.

Soils

Soils in the Globe-Miami area are warm, semiarid climate types, usually found below 5,000 feet elevation. The general distribution of soil associations was described by Vogt and Richardson (1974).

Table 2

1973 AND 1974 AIR QUALITY MONITORING DATA FOR THE GLOBE-MIAMI AREA

Particulate Data Summary ($\mu g/m^3$)

Location	Year	Annual Geometric Mean	24-Hour Maximum	Average Second High	Number of Samples
Inspiration Mine	1973	144	473	0	0
	1974	59	174	130	53

1974 Chemical Composition of Particulates ($\mu g/m^3$)

	Benzene Soluble Organics		Sulfates		Copper		Iron		Lead		Zinc	
Location	Avg.	Max. 24-hr.	Avg.	Max. 24-hr.	Avg.	Max. 24-hr.	Avg.	Max. 24-hr.	Avg.	Max. 24-hr.	Avg.	Max. 24-hr.
Inspiration, Arizona Highway 88	1.4	4.9	9.4	31.4	0.34	1.07	0.8	1.2	0.3	0.7	0.12	0.20

1973 and 1974 Sulfur Dioxide Data Summary ($\mu g/m^3$)

						Number of Times Standards Exceeded		
Location	Year	Avg.	3-hr.	Standards Exceeded	24-hr.	Federal Primary	Arizona	Percent Data Recovery
Inspiration, Arizona	1973	52	3,127		542			
Highway 88	1974	43	2,669	5	482	4	8	93.2
Fire Station		79	2,817	5	575	2	5	99.1
Jones Ranch		170	5,992	19	1,785	10	12	74.9

Particulate Standards ($\mu g/m^3$)

	Annual Geometric Mean	24-hr. Average
State	60	150
Federal primary	75	260
Federal secondary	60	150

Sulfur Dioxide Standards ($\mu g/m^3$)

	Annual Average	3-hr. Average	24-hr. Average
State	50	1,300	260
Federal primary	80	--	365
Federal secondary	--	1,300	--

Source: Arizona Department of Health Services, 1975; Earle V. Miller Engineering, 1975.

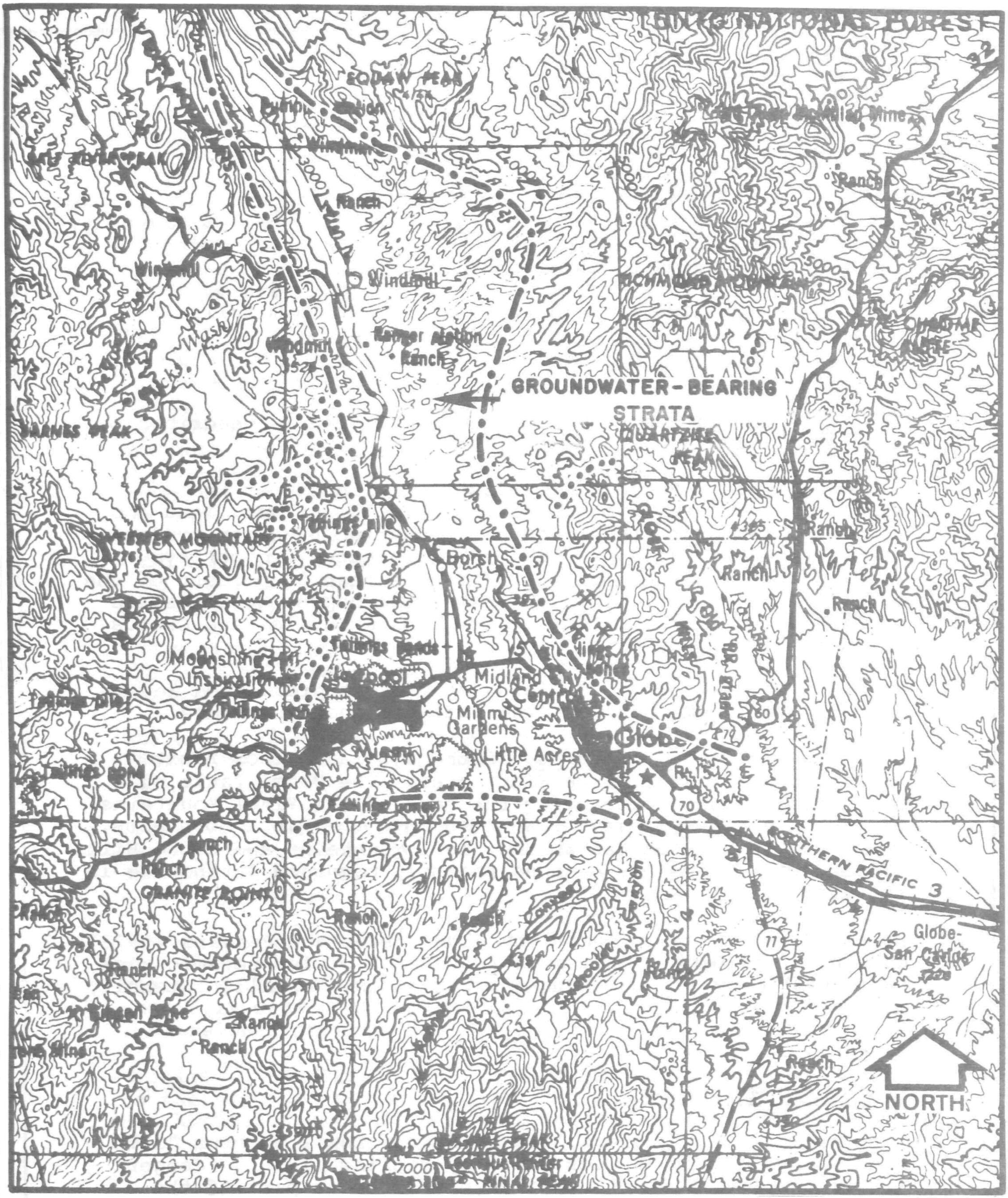


Figure 2

TOPOGRAPHIC FEATURES OF STUDY AREA. PRINCIPAL GROUND-WATER BEARING AREA AND FAULTS ALSO SHOWN.

.... Major Fault

There are five general soil associations in the study area: Mabray-Lithic torriorthents association, Cellar-Lampshire-Rock outcrop association, White House-Caralampi-Hathaway association, Continental-Eba-Nickel association and Barkerville-Moani-Faraway association. The first two are shallow gravelly, sandy loamy soils covering bedrock with rock outcroppings. The next two are deep clay and gravel soils found in old alluvial fans and terraces. The last one consists of very shallow and shallow gravelly loam and sandy loam soils.

Geology

General. The geology of the Globe-Miami area is described by Peterson (1962).

Globe-Miami is a major mining district with copper the single most important metal, although gold, silver, lead and zinc are also extracted. Copper production has been predominately from the large low-grade, disseminated or "porphyry-type" deposits. These account for more than 80 percent of the copper mined so far. The most extensive copper deposits are the Miami-Inspiration, Castle Dome, Copper Cities and Cactus deposits.

The economic life span of mining at present production levels is not known, but local persons estimate about 30 years.

Faulting and Seismic Hazards. Both major and minor fault systems occur in the Globe-Miami area. The Miami fault runs near Gerald Wash, south along the base of the Pinal Mountains, through the Town of Miami and south into the Pinal Mountains. Other faults are located in the Pinal Mountains and Globe Hills (Figure 2). There has been no recently recorded earthquake in the Globe-Miami area.

Seismic zoning maps prepared by Algermissen and Perkins (1973), designate the Globe-Miami area as an area of low seismic risk, based on historical earthquake occurrences, Mercalli intensity and geology.

Biological Resources

Very broadly, the project area is in the Lower Sonoran "life zone" as that term was described by Merriam (1890). Jaeger (1957) characterizes the area around Globe as part of the Arizona upland desert, the northeasternmost subunit of the Sonoran desert. Kuchler (1964) mapped the "climax" vegetation of the general Globe-Miami area in three categories. Most of the area west and north of Globe was characterized as a transition zone between the oak-juniper woodland and the mountain mahogany-oak scrub communities. The immediate Globe area and areas south and east of Globe are characterized by Kuchler as grama-tobosa shrubsteppe. Areas adjacent to the Salt and Gila Rivers are mapped as the creosote bush-bur sage community

Vegetation. In the Globe-Miami area, the various shrub communities in the surrounding hills and canyons often extend into washes and arroyos to form a dry riparian community. The upper portions of Pinal Creek and Bloody Tanks Wash and the lower sections of Pinal Creek contain a cottonwood-sycamore riparian community, which is dependent upon a constant supply of subsurface water. The shrub communities are comprised of small-leaved desert trees, shrubs and cacti and the best development is attained on rocky hills, bajadas and other coarse-soiled slopes. The primary desert trees are foothill paloverde, sahuaro, iron wood, holocantha, and tree-like chollas. Shrubs include creosote bush, teddy bear cholla, ocotillo and brittlebrush.

The principal vegetation of the dry washes and arroyos are the blue paloverde, mesquite, catclaw, jumping bean and netleaf hackberry.

The riparian community found in the Pinal Creek and Bloody Tanks Wash is composed primarily of cottonwood, sycamore, and oak.

There is intermingling of plant species between the shrub communities of the hills and the dry wash plant community. The boundary between these two is not a distinct line but is a blending of species (a species list is in Appendix A).

Native vegetation has been altered in many areas by ranching and other human activities. In alluvial areas the soil was historically cultivated for row crops and grain. This use has generally ceased and these lands are in various stages of successional growth.

Wildlife. Wildlife common to the Sonoran desert are adapted to the hot, dry desert environment and are listed in Appendix B. Although the list is not comprehensive, it shows the more characteristic and commonly seen species.

Reptiles are among the most conspicuous and common animals observed in the desert. Lizards are usually seen during daylight hours while snakes are more nocturnal. Most reptilian species are carnivorous, feeding on insects, other reptiles, small birds and mammals. Most reptiles are active primarily in the warm season, hibernating during cold winter months. Many small mammals also exhibit variable periods of torper during the winter months.

Desert birds may be readily observed in the thinly foliated desert shrubs. Most desert birds are either insectivorous, predaceous or scavengers; however, some feed on scarce desert berries, mistletoe and parts of succulent plants. Although all birds are important ecologically, the Gambel quail and mourning dove are also extensively hunted in the Globe-Miami area.

Most desert mammals have nocturnal habits to avoid the daylight heat. Some require very little free water, deriving most of their water from their food; however, deer, coyotes, foxes, bobcats, mountain lion and skunks do require some free water. In the Globe-Miami area, deer, peccary and desert cottontail are important game mammals.

Because there is little permanent surface water in the study area, a significant fishery resource does not exist. Pinal Creek from Pringle Ranch to the Salt River is the only perennial surface flow in the study area. Fishes found in this section of the creek probably include the longfin dace, mosquitofish and Gila Mountain sucker. Roosevelt Lake at the terminus of Pinal Creek supports a large warmwater fishery.

Rare and Endangered Wildlife. Ten species of wildlife identified by the U. S. Department of Interior (1975) as endangered or possibly threatened with extinction could occur within the study area. These animals are listed in Table 3 along with their status, habitat and distribution in Arizona.

Of the ten threatened species of wildlife that could occur in the study area, the Gila monster and coati mundi are probably resident in the area. The threatened hawks and falcons could occur in the study area for at least part of the year. The habitat requirements and distribution of the spotted bat are too poorly known to reliably assess the probability of its occurrence in the Globe area.

Table 3

RARE AND ENDANGERED WILDLIFE WHOSE DISTRIBUTION INCLUDES THE GLOBE-MIAMI AREA

Name	Status	Habitat and Distribution in Arizona
REPTILES		
Gila monster (Heloderma suspectum)	SU	Deserts and wooded areas often near washes and intermittent streams. Desert areas of Arizona.
BIRDS		
Zone-tailed hawk (Buteo albonatatus)	P	Arid country and deserts. Breeds in central Arizona.
Southern bald eagle (Haliaeetus leucocephalus leucocephalus)	E	Forested and wooded areas near water. Both resident and migratory in Arizona.
Northern aplomado falcon (Falco femoralis septentrionalis)	SU	Arid, brushy prairie, yucca flats, very rare local summer resident in southern Arizona.
Prairie pigeon hawk (Falco columbarius richardsonii)	SU	Could winter in Arizona.
Prairie falcon (Falco mexicanus)	T	Canyons, open mountains, plains, prairies, deserts, resident in Arizona.
American peregrine falcon (Falco peregrinus anatum)	E	Mainly in open country, resident in Arizona.
Spotted owl (Stirix occidentalis)	T	Forest, conifers and wooded canyons, resident in Arizona.
MAMMALS		
Coati mundi (Nasua narica molaris)	P	In wooded areas, cliffs, rocky areas often along lakes and streams, resident in central and southern Arizona.
Spotted bat (Euderma maculatum)	T	Roosts in high cliffs and canyons, possibly coniferous forests. Apparently feeds over open areas and water.

STATUS:

E Endangered. A species or subspecies whose prospects for survival and reproduction are in immediate jeopardy.

T Threatened. Species or subspecies that are so few in number or so threatened by present circumstances, as to be in danger of extinction.

SU Status-Undetermined. A status-undetermined species or subspecies is one that has been suggested as possibly threatened with extinction, but about which there is not enough information to determine its status. More information is needed.

P Peripheral. A peripheral species or subspecies is one whose occurrence in the United States is at the edge of its natural range and which is threatened with extinction within the United States, although not in its range as a whole. Special attention is necessary to assure retention in our nation's fauna.

Source: Compiled from U. S. Fish and Wildlife Service, 1973; Federal Register, 37(98); Peterson, 1961; and Stebbins, 1966.

Aesthetic Values

The Globe-Miami area is located in a small basin surrounded by the rugged and steep Pinal and Apache Mountains. Surrounding areas are part of the Tonto National Forest and San Carlos Indian Reservation and both offer excellent recreational opportunity. Much of the surrounding area is in its natural state offering the views and vistas typical of this desert region.

When traveling in the Globe-Miami area, the most obvious visual impact is the presence of the copper mining industry. An operating copper smelter, old abandoned mills, slag and tailings ponds, raising upward nearly 500 feet, dominate the local scenery. Tailing pond embankments are light colored and sandy in character and completely devoid of any vegetation. Many show extensive water and wind erosion. The Town of Miami contains many old and several delapidated buildings which appear almost engulfed by mine tailings and mills.

The City of Globe, located on a hill east of Miami is also an old mining settlement, founded in 1879. The after effects of mining and smelting are not as evident in Globe as they are in Miami. Tailing ponds are noticeable immediately north of Globe on Highway 60.

Aesthetic values are often a matter of viewpoint, training and immediate interest. To some the visual aspects of the Globe-Miami area are probably negative, while to many they are quaint or positive in terms of history and social development. The air pollution from the smelter is at times obnoxious and probably harmful to human health, property and the general environment. There are probably few persons that consider the air pollution anything but an adversity. Photos of Globe-Miami and the surrounding area are shown in Figures 3 through 6.

Archeology and History

Prior to the time of Hispanic contact, the sedentary village sites were totally abandoned. The area was inhabited by roving bands of Athabascan-speaking Indians. The assumed predecessors of the Pima and Papago people were the Hohokam and they left many abandoned farmsteads and village sites on the tributaries of the Salt and Gila Rivers. There is also a high incidence of Salado pueblo sites in this area. These sites are pre-1500 A.D. and have no ethnic connection to the present population of the San Carlos Apaches.

FIGURE 3

Looking east down Sullivan Street, downtown Miami. Tailing pond in background.

FIGURE 4

Looking north down Broad Street, downtown Globe.

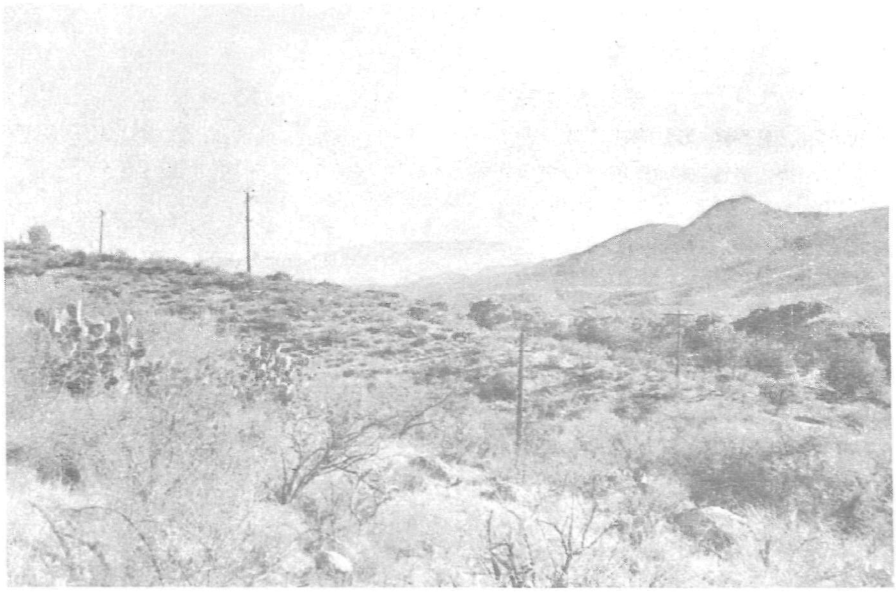


FIGURE 5

Desert environment near Globe.

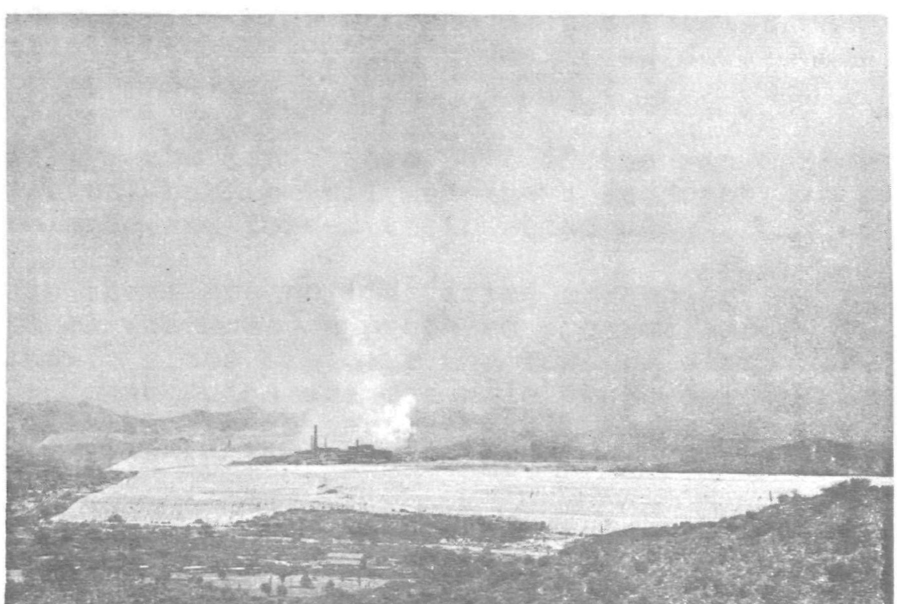


FIGURE 6

Inspiration Consolidated Copper Company, Miami operation. Miami Wash in foreground. Tailing ponds and smelter in center of picture.

During the mid-1800's, the project area was inhabited by a small population of Euro-Americans engaged in farming and ranching. Mining became the principal industry prior to World War I. Up to this period of time, the most noteworthy event was the Bloody Tanks massacre of 1864 when Colonel King S. Woolsey and his party were dispatched to "pacify" the Indians. They ambushed a band of Apaches and reportedly the blood of the dead and wounded so colored the stream waters that the present name "Bloody Tanks" was given to the area. The name Miami is derived from early settlers who named it after Miami, Ohio.

From 1907 to 1912, the Miami Copper Company and the Inspiration Mining Company were begun and developed to a large scale. The town has survived many booms and slumps in the interim, but it still continues to thrive on the mining and processing of low-grade copper ores.

The City of Globe started as a great Arizona mining camp. It was settled in 1876 when silver was located in the area. It derived its name from a globe-shaped chunk of pure silver which is reputed to have been found on the hillside where the Old Dominion Mine is now located. In the late 1800's, copper replaced silver as the major mineral mined in the area. From 1898 until it was shut down during the depression of 1931, the Old Dominion Mine was one of the largest copper mines in the world. However, Globe's continued development was due to the copper deposits.

Originally, the lands were part of the San Carlos Apache Reservation, but the silver miners encroached upon reservation lands and forced their withdrawal from Indian control.

Although there are no identified archeological sites or historical features on proposed project lands, two famous prehistoric sites are near the Town of Globe, Arizona. Besh Ba Gowah Ruins are one mile southwest of the city, while Gila Pueblo is approximately three miles away. There are extensive Indian settlement sites in the area.

Field Assessment. The proposed wastewater treatment plant sites were surveyed on foot by an archeologist (report is Appendix C) with all potential areas of impact carefully examined for evidence of cultural material. All of the project area lies within the floodplain of the Pinal Wash and the Miami Wash with the exception of the four treatment plant sites.

There was no evidence of cultural resources within potential impact zones; consequently, there is no predictable impact on extant cultural resources through placement of the proposed treatment plant at any of the alternative sites. However, this is a high incidence area of Hohokam farmsteads and villages and Salado pueblos, especially on the tributaries of the Salt and Gila Rivers. The probability of site occurrence increases above the floodplain areas and along the channel banks.

Water Resources

Surface Water

The project lies in the Gila River hydrological subunit of the Salt River Basin. Pinal Creek and its tributaries drain the project area. With headwaters in the Pinal Mountains south of Globe, it flows north through the city joining the Salt River just upstream of Roosevelt Reservoir. Along its length, numerous washes join the main stream. The watershed encompasses approximately 175 square miles (Figure 7).

Pinal Creek and its tributaries are generally ephemeral except above Globe and below Pringle Ranch where Pinal Creek is perennial to intermittent. Except for a few localized areas of rising groundwater (due to shallow bedrock layers), surface flow in the section between Globe and Pringle, only occurs following rain or snowmelt. There is a significant subsurface flow at all times. In the vicinity of Pringle Ranch, approximately 14 miles downstream from the confluence of Miami Wash and Pinal Creek, the subsurface flow surfaces and forms a perennial stream to its confluence with the Salt River, a distance of about 4 miles. There are no gauging stations in this section of the stream; however, it has been estimated that the average flow is about 5 cubic feet per second (cfs) but varies according to season and precipitation (Leffert, pers. comm.). Peterson (1962) and the Arizona Department of Health Services (unpublished data) have estimated the flow at this point at 8 cfs. There is reportedly a low dam near Pringle that pools water. Inspiration Copper Company pumps groundwater from this area for use at the mining and milling site.

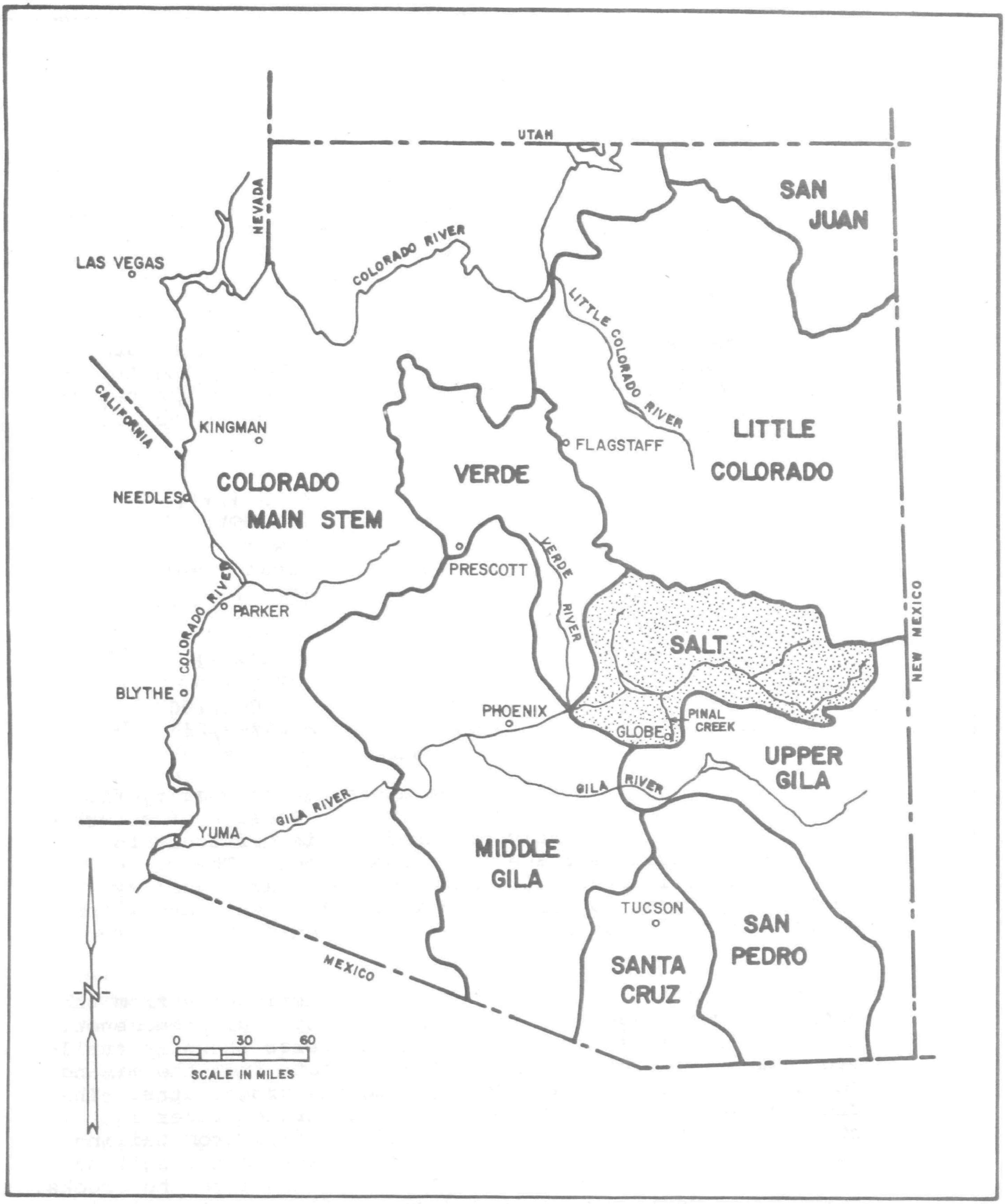


FIGURE 7

RIVER BASINS IN ARIZONA

SOURCE: MODIFIED FROM EARLE V. MILLER ENGINEERS, 1975.

Data describing surface water quality are very scant. Hazen and Turner (1946) conducted water quality analyses on samples from upper Pinal Creek and several springs. Samples were taken after a significant rainfall. Their results are shown in Appendix D. Considering the lack of base data for comparison to the reported data, there is nothing to distinguish the results as aberrant. The water appears to be of fairly good quality.

Surface water quality conditions in lower Pinal Creek are reported in Appendix E. These data were taken by the Arizona Department of Health Services. Certainly some of the reported constituents are much greater in concentration in the lower Pinal Creek than in the upper watershed.

	Hazen & Turner (1946) Upper Pinal Creek (mg/l)	ADHS (1974 & 1975) Lower Pinal Creek (mg/l)
Calcium	8.7-20.0	612-687
Magnesium	5.0- 8.6	60-461
Alkalinity	48-105	130-160
Sulfate	11-18	1,650-2,100
Dissolved solids	59-118	2,267-3,235

These greater concentrations have degraded the quality from the upper to lower reaches of the creek. Because of a lack of data that can be reasonably compared, it is difficult to accurately evaluate surface water conditions. The U. S. Forest Service is presently establishing a water quality monitoring program for the Tonto National Forest, and water quality monitoring on Pinal Creek has recently been implemented.

A small increase in dissolved chemical constituents from the upper to lower reach of a watershed is a natural phenomenon. The large increases in dissolved constituents shown by available data indicate that mineralized leachate from the mining and mineral processing activities into the groundwater. The principal source of dissolved solids in surface water is thought to be surfacing leachates and overflow from tailing disposal ponds. Also, air-borne particulate matter settles in the watershed and during rainstorms washes into the creeks. Thus, during periods of rain and stream flow, waste material, including high concentrations of dissolved chemicals originating in the copper industry, wash into surface channels.

Groundwater

Water-bearing strata (aquifers) underlie most of the area in the vicinity of Globe, Miami and lower Pinal Creek. The principal aquifers are the Gila conglomerate and more recent alluvial deposits along the creeks and washes. Deep, dry wells indicate that some portions of the Gila conglomerate are not permeable to water. The older sedimentary metamorphic and igneous rock formations in the area are generally impermeable or non-porous and contain little water. Some limestone formations in the Globe Hills and surrounding area are cavernous and fractured and serve as aquifers (Hazen and Turner, 1946). Aquifers at elevations above Pinal Creek alluvium are now being extensively developed as domestic supplies.

Most of the water found in the Gila conglomerate is derived from the percolation of surface runoff. Other sources of recharge include drainage in the surrounding mountains into zones of factured diabase, limestone and schist. Surface water also enters the groundwater through the tailings ponds.

There appears to be considerable groundwater movement in the Pinal Creek drainage. According to Hazen and Turner (1946), the pattern of northwest trending, parallel faults in the Gila conglomerate extending from the mouth of Icehouse Canyon to the northwest, tend to force groundwater to move down the valley to the west of Pinal Creek. This subsurface flow is forced to the surface near Pringle Ranch, where bedrock rises nearer the surface.

Based on calculations made in March 1945 (Hazen and Turner, 1946), the total available groundwater at the Pringle Pumping Station was 6,000 to 7,000 gpm. The maximum underground flow of the recent alluvial deposits under Pinal Creek at the Pringle Pump Station was determined to be approximately 2,000 gpm. Approximately 4,000 to 5,000 gpm was available through water-bearing strata in the Gila formation or from limestone outcropping in the sides of the valley; however, these sources are relatively small. Thus, most of the groundwater flow in Pinal Creek at Pringle Ranch was predicted to be from the upper stream portion of the creek and the Gila conglomerate that underlies it. (Although the accuracy of the values cited above is suspect due to changing conditions of groundwater use, these values may still represent an "order of magnitude" assessment of the current situation.)

Groundwater quality is variable throughout the Globe-Miami lower Pinal Creek area. Well water analyses done by the Arizona Department of Health Services in 1974 (unpublished data) revealed the water to be abnormally high in sulfates (SO_4), dissolved solid residue, iron (Fe), manganese (Mn) and several anions (calcium, sodium, magnesium) content. Abnormally high concentrations of dissolved substances in the groundwater are thought to result from the milling wastes and acid leachates used in extracting copper from mixed oxide and sulfide ore. Milling and process waste materials, containing soluble materials are pumped to tailing ponds where the water either evaporates, remains bound to solids or leaches into the groundwater. The proportional distribution is unknown at this time.

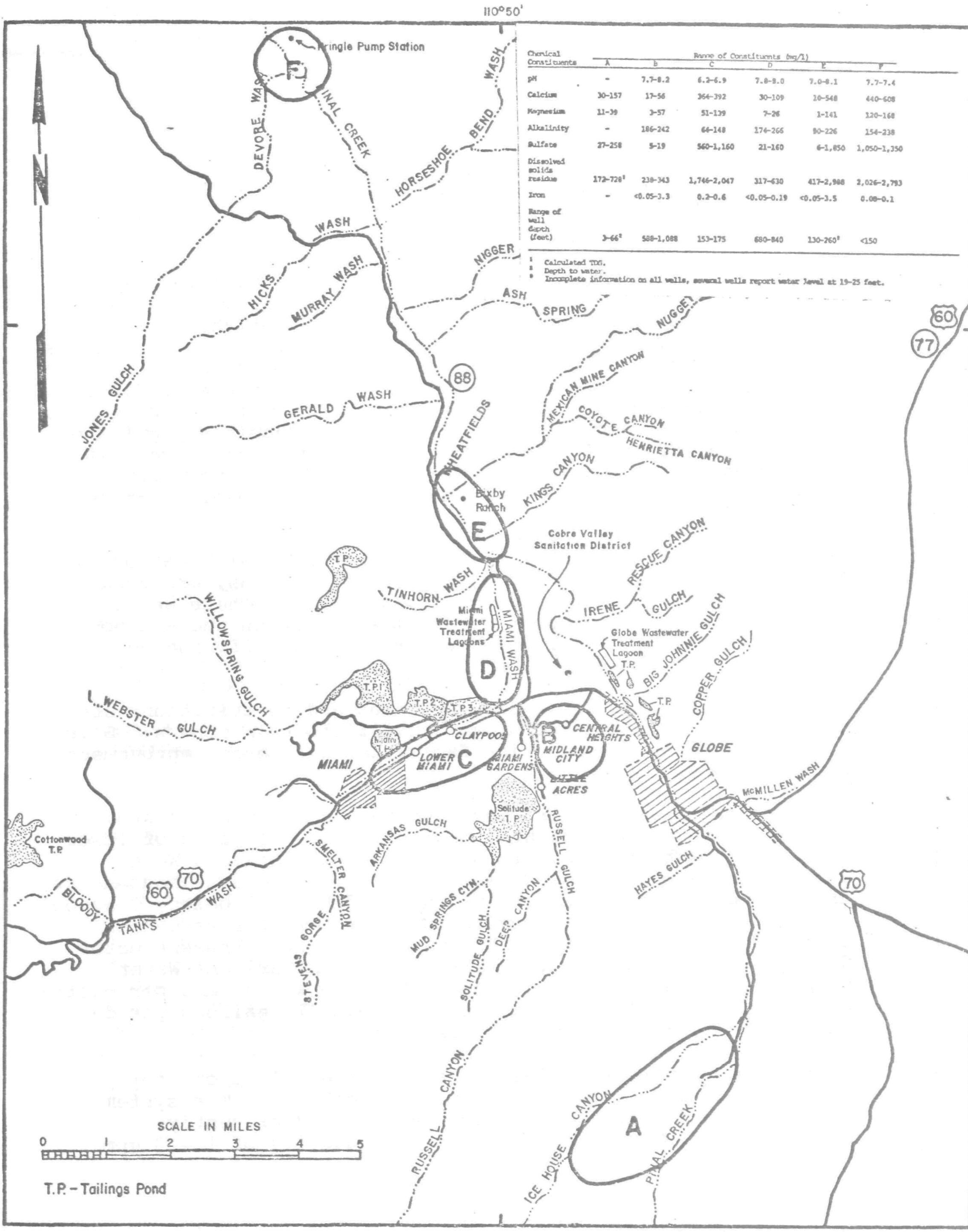
Data on groundwater quality from numerous wells in the area are presented in Appendices F, G and H. Some of this data is compared for the different groundwater areas in Figure 8. The generally poor domestic water quality areas appear to be near Miami and Claypool, the Bixby Ranch area, and the Pringle Pump Station area. These areas show generally high concentrations of sulfates and dissolved solids, while iron concentrations are high in the Miami, Claypool and Bixby Ranch areas.

The upper groundwater aquifer (less than 250 feet below the ground surface) appears to be the most degraded, especially in the vicinity of Bloody Tanks Wash, Miami Wash, and Pinal Creek from the confluence of Miami Wash to the Pringle Pump Station. Deeper aquifers (500 to 1,000 feet below the ground surface), as shown in the Central Heights area, produce good mineral quality potable water. The shallow aquifers in upper Pinal Creek above Globe produce relatively good quality water; however, more data is needed to adequately assess this area.

Poorer quality groundwater, especially regarding mineral constituents, is located near areas of active, long-term copper mining activity.

Water Use and Supply

The two major uses of water in the Globe-Miami area are domestic and industrial. The amount of water used for agriculture and other uses is relatively insignificant. All water is from wells that are located both in and outside the Pinal Creek watershed. Domestic water for the City of Globe is supplied



Chemical Constituents	Range of Constituents (mg/l)					
	A	B	C	D	E	F
pH	-	7.7-8.2	6.2-6.9	7.8-8.0	7.0-8.1	7.7-7.4
Calcium	30-157	17-56	364-392	30-109	10-548	440-608
Magnesium	11-39	3-57	51-139	7-26	1-141	120-168
Alkalinity	-	186-242	64-148	174-266	90-226	154-238
Sulfate	27-258	5-19	560-1,160	21-160	6-1,850	1,050-1,350
Dissolved solids residue	172-728[1]	238-343	1,746-2,047	317-630	417-2,988	2,026-2,793
Iron	-	<0.05-3.3	0.2-0.6	<0.05-0.19	<0.05-3.5	0.08-0.1
Range of well depth (feet)	3-66[2]	588-1,088	153-175	680-840	130-260[3]	<150

[1] Calculated TDS.
[2] Depth to water.
[3] Incomplete information on all wells, several wells report water level at 19-25 feet.

FIGURE 8: CHEMICAL & PHYSICAL CHARACTERISTICS OF GROUNDWATER IN VARIOUS AREAS OF PINAL CREEK WATERSHED. DATA COMPILED FROM APPENDICES F, G, & H.

primarily from well fields located at Cutter and secondarily from a smaller well field located in the city. The Cutter Well Field is about 4 miles east of Globe and immediately west of the San Carlos Indian Reservation and is in the Gila River basin.

The total pumping capacity of the three wells at the Cutter Well Field is 3,000 gallons per minute (gpm) or 4.32 million gallons per day (mgd). A safe annual yield, which is the amount of water which can be withdrawn annually on a continuous basis, has not been determined. No long-term records of static groundwater elevations are available. The Cutter Well Field is locally considered adequate to meet expected water needs to the year 2000. A production of 4.32 mgd could supply a population of about 43,200 at 100 gallons per capita per day. The 1970 population of the upper Pinal Creek area (Globe) was about 10,000 and the year 2000 population has been projected to be about 25,000.

The Pioneer Wells, located in the city near Pinal Creek below the confluence of Icehouse and Sixshooter Canyons, are used only as secondary sources of municipal water. These wells are directly dependent upon annual precipitation and are not considered reliable sources of water (John Carollo Engineers, 1975).

Water supply facilities (storage, pumps and distribution) are adequate in some areas of Globe and deficient in others. Some transmission and distribution facilities will need improvement within five years.

Domestic water supply for Miami and the unincorporated areas of Claypool, Central Heights, Miami Gardens and parts of lower Pinal Creek (Wheatfields) is provided by the Arizona Water Company. They supply approximately 3,041 customers (households) from 13 wells located in the vicinity of Russell Gulch, Claypool and Central Heights. All wells in the Miami area have been abandoned because of unsuitable water quality. Present water demand estimates were not available from the Arizona Water Company; however, in 1969 the reported average demand per customer per year was 100,538 gallons or about 275 gallons per day (about 100 gallons per person per day).

Considering a present 3,041 customers, there is a current estimated annual demand of 306 million gallons. The system storage capacity is 1.76 million gallons and presently-operating wells have combined pumping capacity of 1,200 gpm (1.73 mgd).

A. E. Ferguson and Associates (1971) report the present distribution and supply system for domestic water to be adequate to meet the 1990 population forecast. The population of Miami area is not expected to change substantially in the future.

Water quality in the presently-producing Arizona Water Company wells is generally of acceptable quality; however, several wells are high in sulfate, manganese, and dissolved solids residue. Water quality data from Arizona Water Company wells are shown in Appendices G and H.

Large quantities of industrial water are necessary to supply the copper industry. The Inspiration Consolidated Copper Company and Cities Service Company supply their own industrial processing water from pumps located throughout the study area, the most important being at Old Dominion Mine, Burch, Kiser and Pringle Ranch.

Wastewater Reclamation and Reuse

Because of the high consumptive use in a water-short area, the reuse of treated wastewater becomes a viable consideration. The greatest nondomestic use is in the copper industry. Irrigation of large tracts of land is not being done except for the golf course, which is watered by a mining company. Consequently, the management of water supply in the area must consider the industrial reuse of treated wastewater.

Flood Control

Both Globe and Miami are susceptible to flooding, primarily from intense thunderstorms. Stormwater runoff concentrates quickly in the main drainage channels upstream from Globe and Miami, and surge flows through these channels often exceed their carrying capacities. Although not gauged, a flood condition on July 29, 1954 produced flows through Globe estimated to be 6,500 and 8,000 cubic feet per second at the upstream and downstream city limits, respectively. Floods of comparable magnitude also occurred at Globe in 1891 and 1904. Other floods causing notable damage occurred in 1918 and 1940 with lesser floods in 1928, 1929, 1932, 1949 and 1959.

In Miami on July 20, 1954, a flood crested at an estimated flow of 7,500 cubic feet per second. Similar Miami floods occurred in 1928, with lesser floods in 1929, 1932, 1936, 1937 and 1949 (U. S. Army Corps of Engineers, 1961). The 1928 flood in Miami was estimated at 25,000 to 30,000 cubic feet per second by local residents (U. S. Forest Service, 1942). The Corps of Engineers (1961) has estimated flood frequencies and peak discharges expected in Globe and Miami (Table 4).

Major drainage channels in this area are mostly steep sided, rocky and sparsely vegetated. Very few modifications have been made to Pinal Creek and Bloody Tanks Wash to reduce the flooding of riparian lands. During the 1930's, the Civilian Conservation Corps constructed several check dams in the Upper Bloody Tanks drainage area; however, these dams have deteriorated. Bloody Tanks Wash is channelized with concrete walls through the Town of Miami; however, the concrete is deteriorating and debris in the channel has reduced its carrying capacity which is presently about 2,000 cubic feet per second (cfs).

Population

Existing Conditions

The Globe-Miami area is the principal population center of Gila County, containing over 60 percent of county residents in 1970 (Globe-Miami, 18,861; Gila County, 29,555). The decade census populations of the Globe-Miami area from 1930 to 1970 are presented in Table 5. The population density of the area presently exceeds 1,000 persons per square mile (Earle V. Miller Engineers, 1975).

Overall growth in the project area has been relatively slow; however, from 1960 to 1970, the population of Globe increased by 18 percent, while the overall increase in the area was about 9 percent (Ferguson, 1971). Although the Town of Miami has experienced an absolute decline in population since 1930 (when it counted 7,693 residents), the Miami area, including the adjacent unincorporated communities of Central Heights and Claypool, contained about 8,000 persons in 1970. While most of the growth in the Globe-Miami area between 1960 and 1970 took place within incorporated areas, a significant amount (about 25 percent) took place in unincorporated areas. Growth has been taking place in unsewered areas as well.

Table 4

ESTIMATED FLOOD FREQUENCIES AND PEAK DISCHARGES
IN GLOBE AND MIAMI, ARIZONA

	Uncontrolled Peak Discharges	
Number of times that flood would be equalled or exceeded in 100 years	Pinal Creek below confluence with McMillen Wash in Globe	Bloody Tanks Wash below confluence with Liveoak Gulch in Miami
	Cubic feet per second	Cubic feet per second
0.2	*34,000	*26,000
1.0	***17,700	***13,400
5.0	8,100	6,100
10.0	5,400	4,150
16.2	** 4,000	(#)
17.0	(#)	** 3,000

* Standard project flood.
** Non-damaging.
*** 100 year.
\# Not estimated.

Source: U. S. Army Corps of Engineers, 1961.

Table 5

HISTORICAL POPULATION DATA FOR THE GLOBE-MIAMI AREA, 1930-1970

Year	Gila Co.	Miami	Central Heights (U)	Claypool (U)	Globe	Other Unincorporated Areas*
1930	31,016	7,693	N.T.	N.T.	7,157	-
1940	23,867	4,722	N.T.	N.T.	6,141	-
1950	24,158	4,329	N.T.	N.T.	6,419	-
1960	25,745	3,350	2,486	2,505	6,217	2,738
1970	29,255	3,394	2,289	2,245	7,333	3,600

N.T. Not tabulated.
(U) Unincorporated areas.
* Ferguson, 1971, Population and Economic Study.

Source: U. S. Census of Population-1970 and 1960: General Population Characteristics, Arizona (Tables 6 and 10); 1950: Characteristics of the Population, Arizona (Tables 11 and 12); 1940: Number of Inhabitants, Arizona (Tables 4 and 5); 1930: Reports by State, Arizona (Tables 13 and 16) (Arizona Department of Economic Planning and Development, 1971).

The 1970 population distribution by watershed and subunit, as used by John Carollo Engineers in their facilities plan, is presented in Table 6. The total project area population differs by 1,361 (18,861-17,500) in the data shown, and these figures have not been reconciled.

Employment

Employment data are presented by industry in Table 7. These figures are drawn from the 1960 and 1970 censuses and indicate the industry in which residents of the area work rather than the job counts within the jurisdictions.

Overall employment increased about 20 percent, while population increased about 12 percent in Globe and Miami (Table 6). This 1960-1970 disparity between population and employment growth is not uncommon because women joined the labor force in large numbers during the 1960's.

The data in Table 7 appear to indicate that mining employment fell during the decade, but this was not confirmed by local observers. It seems likely that census data collection categories were revised and that mining jobs reported in 1960 were reclassified into the manufacturing sector in 1970 when smelting was considered manufacturing rather than mining. Also, the "other" category for Miami is probably largely mining; the latter category was (for unexplained reasons) not separately tabulated for the Town of Miami in 1970. Thus, mining and mining-related manufacturing jobs held by residents appear to have increased during the 1960's. However, employment in transportation, communication and utilities in Globe and Miami was virtually the same in 1970 as in 1960.

"Commercial" employment may be in offices or service establishments as well as in retail outlets. Reviewing together the three industry sectors -- wholesale and retail trade; finance, insurance and real estate; services -- data presented in Table 7 indicates that these are not employment sources which have been expanding rapidly; growth between 1960 and 1970 was under 3 percent.

Table 6

POPULATION OF GLOBE-MIAMI AREA BY WATERSHED, 1970

Watershed	1970 Population	Components	1970 Population
Bloody Tanks Wash	5,600	Miami	3,400
		Lower Miami	800
		Claypool	1,400
Russell Gulch Basin	1,300		
Miami Wash Basin	160		
Upper Pinal Creek	10,010	Gila Basin	neg.
		Six-shooter Canyon	600
		Ice House Canyon	500
		Globe	7,330
		Echo Canyon	580
		Quail Canyon	neg.
		Central Hts. Basin	1,000
Lower Pinal Creek	430		
TOTAL	17,500		

neg. = negligible

Source: John Carollo Engineers, 1972.

Table 7

Employment by Industry, 1960 & 1970

Major Industry Group	Gila County 1960	Gila County 1970	Globe & Miami 1960	Globe & Miami 1970
Agriculture, forestry and fisheries	278	385	30	N.T.
Mining	2076	1804	894	N.T.
Construction	599	621	214	287
Manufacturing	947	1663	178	1493
Transportation, communications & utilities	258	373	121	118
Wholesale & retail trade	.463	1676	622	658
Finance, insurance & real estate	201	225	89	140
Services	907	2012	748	696
Government	381	546	145	211
Other/not reported	199	N.T.	55	978
Total Employed	7757	9297	3035	3653

N.T.= not tabulated

Source: U. S. Census of Population, General Social & Economic Characteristics, Arizona, 1970 (Tables 117 and 123) and 1960 (Tables 81 and 85).

Future Trends

Population forecasts were prepared for the study area based on the Bureau of the Census forecast of state population, the assumption that recent trends in county populations as a proportion of the state population will continue into the future and, finally, the assumption that local communities will have the same growth rate as the county in which they are located. The latter assumption was set aside where local circumstances made judgmental adjustments advisable. County forecasts have been prepared by the Arizona Department of Economic Planning and Development (1971) and local area forecasts by Earle V. Miller Engineers (1975) for the Arizona Department of Health. The local area population forecasts are presented in Table 8.

The basin plan forecast for the year 2000 is 31,200 persons (Earle V. Miller Engineers, 1975). This compares with the 32,000-32,500 population forecast utilized by John Carollo Engineers (1972) in preparing the Greater Globe-Miami Wastewater Report. If the adjacent rural population is increased from 900 to 3,600 to fit the data in Table 8, then the projected 1995 population would be about 34,680. Thus, available population projections consistently forecast that the 1990-2000 population will be 31,000-35,000.

The average increase forecast by subarea for the 20-year period 1970-1990 is over 70 percent. Globe is forecast to grow by 80 percent over this period, with the unincorporated areas growing at a slightly higher rate. Miami's growth is forecast at 30 percent. This comparatively small forecast increase presumably reflects possible extension of copper mining into the town in future years. Both the Town of Miami and the City of Globe may experience future growth due to annexation; annexation accounts for part of the increase in the population of the City of Globe in recent years. Aside from uncertainty concerning future mining activity within presently settled areas of Miami, there are several other potential influences on future population growth. These are summarized below.

Future employment in the Globe-Miami area is expected to continue to be dominated by copper mining and processing. However, the gradual reduction in dependence on the copper industry which has been experienced in recent years is expected to continue. For Gila County as a whole, employment in mining has grown at an average annual rate of 2.3 percent since 1950. Employment in various government positions has grown considerably faster (8.6 percent average annual growth rate), with the majority of labor earnings from state and local rather than federal government. A moderate growth rate in the government sector, which currently ranks third in employment in Gila County, is expected in the future (Arizona Department of Economic Planning and Development, 1971).

Table 8

Miami-Globe Area Population Projections

Area	1970	1980	1990	% Increase 1970-1990	1995
Miami	3,390	3,800	4,400	30	4,700
Claypool	2,245	3,500	4,100	83	4,300
Central Heights	2,290	3,600	4,300	88	4,500
Globe	7,330	11,200	13,200	80	14,200
Adjacent Rural Areas	900*	1,400	1,700	89	1,750
TOTAL	16,155	23,500	27,700	71	29,450

* In the previously presented 1970 population data, adjacent rural areas have a population of about 3,600; thus the basin plan forecast may be low.

Source: Earle V. Miller Engineers, 1975.

Wholesale and retail trade ranks second after mining in terms of number of employed persons in Gila County. Much of this employment is in tourist-serving businesses, such as food stores, eating and drinking places and gasoline service stations.

Continued growth in the trade sector and in services as well is anticipated, based on both growth of resident population and continued increases in tourist travel through the area. With regard to the trade and service sectors as a whole, no significant change in the scale of operation of present establishments is expected. The fact that the major metropolitan centers of Phoenix and Tucson are less than half a day's drive means that a significant portion of local residents' demand for consumer goods will continue to be satisfied outside the immediate Globe-Miami area when price savings is a major factor.

The potential for significant new manufacturing activity in the Globe-Miami area does not appear to be great. With the exception of the copper rod fabrication plant (an outgrowth of the area's mining activity), there have been no significant new industrial establishments in recent years. As no dramatic increase in employment in the area is expected, population growth attributable to employment expansion is expected to be moderate.

While pass-through tourist traffic will continue to provide important economic benefits to the community, it appears unlikely that the area will experience significant residential growth which is recreation-oriented. Similarly, the appeal of the area to retired persons from outside Gila County appears at present to be slight.

The present inadequacy in housing supply in the area may well act as a retardant to future growth. At present, new residents in the community report difficulty finding houses, particularly rental units. As availability of housing is typically a critical consideration in location decisions of industrial firms, the present tight housing market could certainly be a disincentive to major industrial growth.

Development constraints related to availability of developable land and availability of utility facilities do not seem to be recognized in the population projections discussed above.

Land Use

In the total project area the principal land use is for copper mining and processing. Large acreages are in tailings ponds, open pits and processing compounds. These lands generally surround Globe and Miami except to the north. The general magnitude of tailings ponds use can be interpreted from Figure 1. General land use in the project area is shown in Figure 9. Concentrated residential and commercial development is generally restricted to Miami, Globe and smaller unincorporated communities. There is a tendency for strip, commercial development along Arizona Highways 60 and 70. Outside the urban areas residences are scattered along the state highways and major county roads. Agricultural land use is generally restricted to cattle ranching along Pinal Creek north of Globe. Cattle ranching is dependent on the permitted use of surrounding U. S. Forest Service land. Open, undeveloped public land managed by the U. S. Forest Service is wide-spread and surrounds the area.

Residential

The dominant type of housing in the study area is single family. Of the total residential land in Globe and Miami, less than 2 percent is devoted to multi-family units.

Between 1960 and 1970, the number of housing units in the Globe-Miami area (Globe, Miami, Claypool and Central Heights) increased by approximately 3 percent; during the same period, the population increased by approximately 5 percent. Changes in the number and types of housing units during this period are presented in Table 9.

Although quantitative documentation is lacking, it is evident that mobile homes have become increasingly popular in recent years. There is a tendency for mobile homes to be placed on lots outside the incorporated communities of Miami and Globe. Globe, as city policy, does not permit mobile homes throughout much of the city. Building permit statistics for unincorporated areas of Gila County in fiscal year 1973-1974 indicate that 60 percent of the 399 residential unit permits issued were for mobile homes. The split between conventional and mobile homes is probably about 50-50 in the unincorporated portions of the Globe-Miami area (Stansel, pers. comm.).

The popularity of the mobile home derives from several factors. Compared to conventional housing, the initial cost is low. It is not taxed as real property (Puso, pers. comm.). It is more flexible in that it can be moved from one location to another. Land may be leased or rented for placement of the mobile home. Finally, a severe shortage of rental units exists in the Globe-Miami area and the mobile home serves what, in other urban areas, would be the rental housing market.

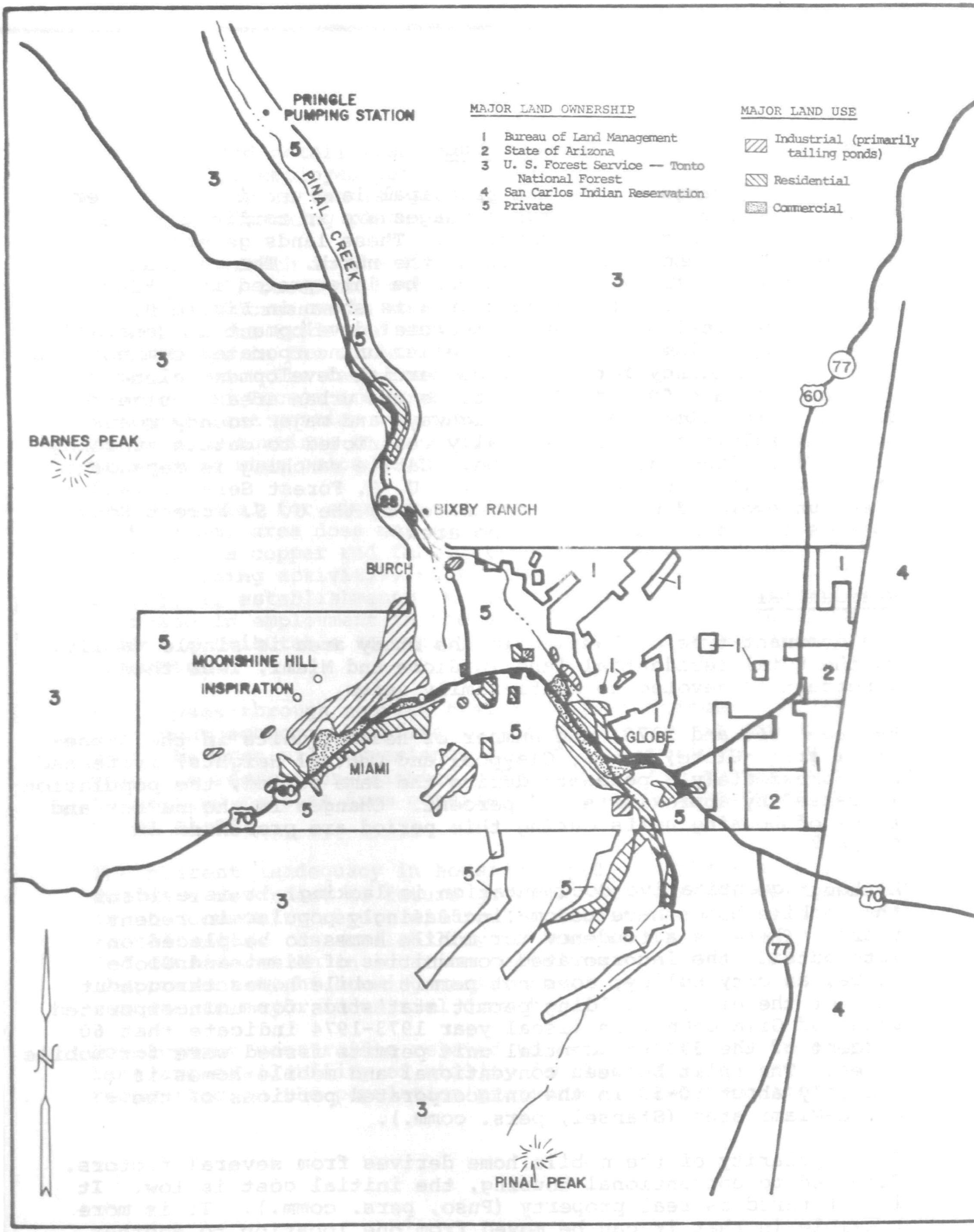


FIGURE 9

LAND USE AND OWNERSHIP

Table 9

Housing Stock of Globe-Miami Area, 1960 & 1970

	Year	HOUSING UNITS Total Year Round	Single-Family Conventional Construction	Single-Family Mobile Homes	Multi-Family	Vacancy Rate[2] %
Miami	**1960**	**1,185**	**1038[1]**		**147**	**9.3**
	1970	**1,139**	**967**	**31**	**141**	**4.5**
Globe	**1960**	**2,364**	**1902[1]**		**462**	**9.4**
	1970	**2,486**	**2052**	**105**	**329**	**2.9**
Claypool	**1960**	**803**	NOT TABULATED[3]			**3.0**
	1970	**777**	NOT TABULATED[3]			**3.6**
Central Heights	**1960**	**728**	NOT TABULATED[3]			**3.5**
	1970	**761**	NOT TABULATED[3]			**1.6**
Area Total	**1960**	**5,080**	NOT TABULATED[3]			**7.5**
	1970	**5,163**	NOT TABULATED[3]			**3.1**

[1]**Mobile homes not separately tabulated in 1960.**

[2]**Calculated as follows: (available vacant units) ÷ (available vacant units & occupied units).**

[3]**Needs Study, p. 57, indicates that there were about 300 mobile homes altogether in Miami, Claypool and Central Heights in 1970.**

Source: U. S. Census of Housing, Characteristics for States, Cities & Counties, Arizona, 1970 (Tables 58 and 62) and Characteristics for States & Small Areas, Arizona, 1960 (Tables 25 and 28).

Other impediments to residential construction are the topography and available financing. The relative paucity of flat, developable land inhibits large-scale residential construction; consequently, construction is conducted on an individual unit basis at higher costs.

Utility availability may also constrain the supply of new housing. The Town of Miami has a ban on sewer connections. Water supply is a problem in some areas, particularly in the canyons south of Globe (Six-shooter, Ice House and Kellner Canyons). There is a ban on new natural gas connections in the area due to the pervasive shortage of natural gas; new housing units must be served by electricity for all energy needs and the cost of electricity has been rising sharply. The cost of home heating with electricity may be as high as the monthly mortgage payment during cold winter months (Stansel, pers. comm.).

Finally, while no one disputes the need for increasing the supply of housing, there is a lack of what economists call "effective demand". The number of persons in the market for new housing, either new residents of the area or area households wishing to move to newer units, is not sufficient to support tract construction. As a consequence of all the above constraints, there has been very little subdivision activity in the Globe-Miami area. It has been reported that the Pioneer Hills subdivision is the first in the area with financial backing for more than 50 lots (Stansel, pers. comm.). The developer is the Holgate Company, a subsidiary of Cities Service Copper Company. The total number of lots is about 300 but less than 20 percent are currently built on and some completed units have not been sold. These units have about 1,200 square feet and sell for $30,000-$35,000. The overall housing picture is one of a present shortage growing more severe with time.

Industrial

The principal economic base is mining and related activities. Early miners sought silver deposits, but these deposits were exhausted in 10 years. Thereafter, copper became the most important metal. The local copper industry was recently estimated to be worth $70 million annually and employing 3,500 people in the project area (Earle V. Miller, 1975). Inspiration Consolidated Copper Company has the most extensive mining and manufacturing operations in the area employing some 2,000 people. Cities Service Copper Company and Ranchers Exploration and Development Company also operate copper mines in the area. Asbestos is mined in Salt River Canyon and processed at a mill seven miles east of Globe by the Jaquays Mining Corporation. Lime is mined and processed north of Miami by the Moore Lime Company.

Most of the manufacturing activity in the study area is related to the copper mining industry; it is estimated that 70 percent of all manufacturing employment is found in copper smelting (Arizona Department of Economic Planning and Development, 1971). Western Pine Industries operates a sawmill just east of Globe, which processes lumber from northern Arizona. Soil Needs Incorporated also produces soil additives and decorative bark products in the area. A recent development is the organization of Peridot Mining and Manufacturing Company employing about 60 workers on the San Carlos Reservation east of Globe.

Commercial

Globe is clearly the major commercial location in the project area; most of the commercial activity is found in food stores, eating and drinking places, and gasoline service stations. Residents make most of their purchases of durable goods outside the county because they are relatively close to Phoenix and Tucson (Arizona Department of Economic Planning and Development, 1971).

The commercial trade in Miami is similar to that in Globe but limited by comparison. A small amount of commercial trade is found in unincorporated communities such as Claypool and Central Heights, e.g., a shopping center, including Sears, a supermarket, a dime store, a free-standing restaurant, a free-standing bank and a half dozen shops opened in 1974 near the junction of the Globe-Miami Highway and State Route 88.

Public and Quasi-Public

Both Miami and Globe devote land to public and quasi-public uses. Such entities as churches, cemeteries, parks and schools are available to all members of the community.

These land uses in Miami include seven public schools, one roadside park, one community swimming pool, a library, eight churches, and locations for city government operations (such as the police and fire department buildings). Miami also has the Miami-Inspiration Hospital, a recently-constructed 51-bed facility funded by Inspiration Consolidated and Cities Services, primarily to serve employees of the copper companies.

Globe, as the largest city in the region, has a larger public and quasi-public infrastructure than Miami. In addition to more extensive public services, Globe has a large cemetery and the Gila County Hospital. Globe also contains 22 churches, as well as the Gila-Pueblo campus of Eastern Arizona Community

College. The Gila County Courthouse is on Broad Street in Globe and the site of the new courthouse to the east of Globe is at the junction of U. S. Highways 60 and 70.

Transportation

The major thoroughfare of the study area is U. S. 60-70, two separate highways which are unified for this stretch of road. U. S. 60 is a major artery to the southern and south-central states, stretching the breadth of the continent from Virginia Beach, Virginia to Los Angeles, California. Access to northern and southern Arizona is provided by Arizona State Routes 77 and 88.

Table 10 presents estimates of average daily traffic (ADT) along the principal highway segments serving the area.

Three trucking companies currently serve the study area. Pacific Motor Trucking Company has a freight depot in Miami, while ONC-Hopper and Western Gillette maintain freight depots in Globe. All three carriers offer scheduled interstate service daily.

Both passenger and freight bus service is offered by Greyhound Bus Lines. In 1971, Greyhound operated four north-south and four east-west buses daily.

Air transportation is provided by the Cutter Airport east of Globe. No regularly scheduled commercial service is presently available at the airport.

Solid Waste Disposal

There is one county solid waste disposal site for local domestic and commercial use. Mine companies use their land for industrial wastes. Certainly tailings disposal constitutes the major solids waste disposal activity in the county, and this activity has a significant adverse impact on aesthetics and surface and groundwater quality in the Pinal Creek watershed.

Table 10

ADT (Average Daily Traffic) on Principal Area Highways

Highway Segment	Average Daily Traffic (ADT) 1974	1973	1972	1964
US 60-70/Gila Co. line to western boundary of Miami	5400	6600	6000	4000
US60-70/Eastern boundary of Miami to SR 88	18,000	20,000	20,000	12,200
US 60-70/SR 88 to western boundary of Globe	16,000	18,000	17,000	11,100
US 60 east of Globe, US 70 to Gila County line	1100	1900	1700	1600
US 70 east of Globe, Globe east to Cutter	2700	2700	2400	2500
SR 77 south toward Winkelman	1100	1400	1300	700
SR 88 north to Tonto Nat'l. Forest	3500	4900	4800	2500
SR 88 north of Nat'l. Forest boundary to Gila County line	920	1100	990	600

Source: Martin Osmus, District Engineer,
Ray Johnson, Planning Survey,
Arizona Dept. of Transportation

Land Use and Impact on Natural Resources

Land use in the area has evolved from Indian villages containing permanent structures and utilizing cultivated agriculture through ranchers and farmers of European ancestry to primarily mining and associated commercial activities. Large amounts of land have undergone irreversible change as a result of mining activities, tailings disposal and chemical pollution. The consumption and pollution of water and resulting changes in Pinal Creek have changed ranching and farming practices. Most of the flat and shallowly-sloping land in and around Globe and Miami is converted to residential and commercial use. The Wheatfields area which was once farm and ranch land is relatively unused for these purposes and some has been converted to mobilehome parks and permanent residences. Historical mining operations damaged lower Pinal Creek land and water. The mining companies presently own much of this land or have other attached rights.

Future Land Use

In the Globe-Miami area, the availability of land for private development is constrained by land ownership. Much of Gila County land is in government ownership (federal and state) and Indian reservation. About two percent is in private ownership and the majority of this that is presently undeveloped belongs to large landowners, mining companies and ranchers. Approximately 83,150 acres of private land in Gila County is considered to be "developed" and devoted to the particular use shown in Table 11.

The Globe-Miami area is bounded by land which is not available for private development. Figure 10 illustrates this situation, showing the ownership pattern of the federal government, the Indian reservation (San Carlos) and the state government. The map does not distinguish among types of private lands, but ranching and, in the immediate Globe-Miami area, mining account for the majority of private uses. Ranching is associated with U. S. Forest Service grazing permits. The largest portion of land in mining use is devoted to tailings ponds, with the mines, smelters and concentrators using a smaller proportion (Arizona Department of Economic Planning and Development, 1971).

The effect of the present ownership pattern is to restrict the supply of land available for residential and other private development. Undeveloped land north of Glode and Miami owned by the mining companies and ranchers constitutes the bulk of potentially developable land. In recent years, modest changes in this situation have been reported. The U. S. Forest Service

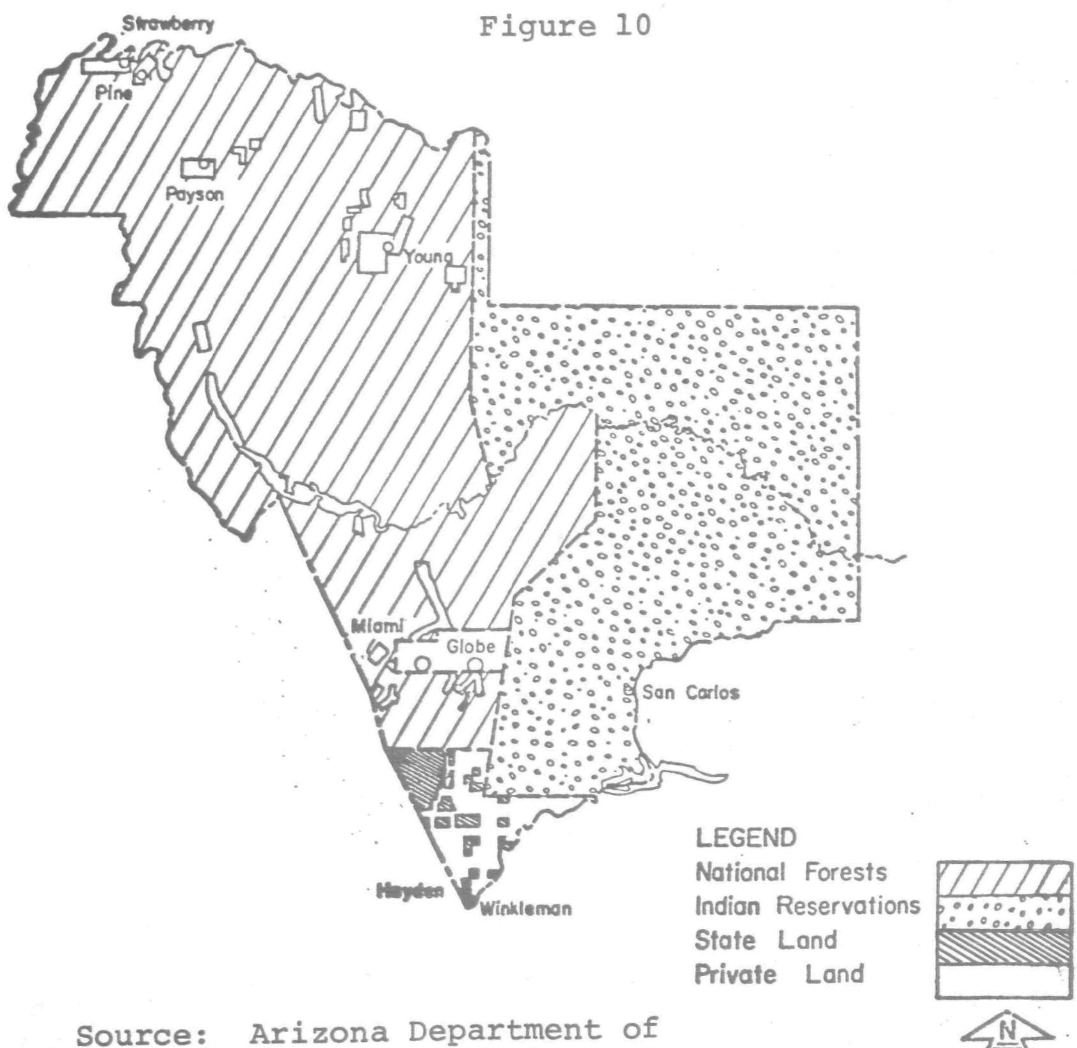
Table 11

PRIVATE DEVELOPED LAND CURRENTLY
IN USE IN GILA COUNTY

Use	Acres	Percent
Ranch and farm	50,000	60.1
Public & quasi-public	26,000	31.3
Mining	4,400	5.3
Residential	2,250	2.7
Commercial	300	0.4
Industrial	200	0.2
TOTAL IN USE	83,150	100.0

Source: Arizona Department of Economic Planning and Development, 1971.

Figure 10



Source: Arizona Department of Economic Planning and Development, 1971.

has been engaged in a program of land exchange. Privately owned land in wilderness and natural habitat areas may be exchanged on a dollar value basis for U. S. Forest Service land in developing areas (Arizona Department of Economic Planning and Development, 1971). So far this program has had less of an impact in the Globe-Miami area than in other urbanized parts of the county (Payson, Young and the Strawberry-Pine area). Although some mining company property has been sold in recent years, the reluctance of mining firms to diminish their holdings is widely known. Thus, no short-term change in the present pattern of land availability and consequently land use is anticipated.

In the long term lands owned by the mining companies found in and around Globe and along lower Pinal Creek (Wheatfields) may be developed for residential and commercial uses. No land use plan predicting such future uses exists for most of the area, thus one may only grossly speculate about future land use.

Land Use Planning

Land use planning in the Globe-Miami area is undertaken by three local jurisdictions: City of Globe, Town of Miami and Gila County. The planning and zoning authority of local jurisdictions is established by Arizona state law through the Urban Environment Management Act (UEMA) which took effect in 1974.

Prior to this act, municipalities had authority to zone, but UEMA broadened the purposes of zoning and added flexibility to zoning administration. The principal contribution of the act was its specific grant of authority to conduct planning (which had been practiced by some Arizona municipalities for many years before this enabling legislation). However, municipalities are not now required to plan, even if they administer zoning or subdivision regulations. There is no specific requirement that zoning or subdivision regulations conform to any existing comprehensive plan. Cities the size of Globe and Miami, less than 50,000, need not address the same wide range of issues which must be addressed in the comprehensive plans of larger cities. Finally, zoning authority is permissive rather than mandatory; a municipality may zone part or all of its jurisdiction, but may also leave some areas unzoned.

The UEMA made no change in state law affecting zoning and planning activities of counties. Counties undertaking such activities must establish a zoning and planning commission, and local jurisdictions may either name a planning commission or name their local legislature (city or town council) as the planning commission.

Means of coordinating planning among jurisdictions are set forth in state law. Each incorporated municipality may enforce its planning, zoning and subdivision controls on outlying unincorporated areas within three miles of the city limits if (1) those powers are not exercised by the county, and (2) the area in question does not lie within another municipality. Where the three-mile sphere of influence of two municipalities coincides, the jurisdictional dividing line is drawn midway between the boundaries of the municipalities. Where a county government has undertaken planning and zoning activities, means of coordination between actions in incorporated and adjacent (within three miles) unincorporated areas are specified. For example, plots of new subdivisions within a three-mile band must be referred by the county to the city. While state law does not give the city veto power in such a matter, a negative recommendation by the city might be given heavy weight in the county's decision.

An important power of Arizona's municipalities is that of acquiring lands outside city limits for public purposes. Such acquisitions can be outright purchases or the land can be taken by eminent domain with compensation to the owner of the property. Such property, once in municipal hands and if used for a public purpose, is not subject to the zoning provisions of the surrounding jurisdiction. "Where the power of eminent domain exists, a political subdivision may locate its governmental functions within the territorial limits of another subdivision without regard to limitations created by zoning" (see City of Scottsdale v. Municipal Court of the City of Tempe, 90 Ariz. 393, 397, 368 P. 2d 637 (1962), quoted in Arizona Office of Economic Planning and Development, 1973).

The status of local planning in the area is described below by jurisdiction.

Gila County. The nine-member Zoning and Planning Commission (three from each supervisorial district) is responsible for planning and zoning activities in the county. A zoning ordinance has been adopted (September 1958). A county comprehensive plan was prepared by the consulting firm of A. E. Ferguson of Phoenix, and has been adopted. Subdivision regulations were adopted December 15, 1971. There is no building code. The principal implementation device is the issuance of use permits. However, a large portion of the county is unzoned, and no use permits are required for development taking place in unzoned areas.

Town of Miami. Miami's seven-member Town Council sits as the Miami Zoning and Planning Commission. The Miami Comprehensive Plan was prepared by Ferguson, Morris & Associates of Phoenix and was adopted in 1972. The town's zoning ordinance is currently being revised in response to the comprehensive plan

City of Globe. Globe has a seven-member Planning and Zoning Commission. A zoning ordinance (#446) has been adopted (May 20, 1968). A comprehensive plan was prepared by the consulting firm of Hollinger & Booher of Scottsdale and was adopted in 1972. There are subdivision regulations in effect; an ordinance (#488) regulating mobile homes and travel trailers was adopted on August 21, 1972.

III. ALTERNATIVE WASTEWATER TREATMENT FACILITIES

Introduction

Environmental Protection Agency rules and regulations for the preparation of an EIS (Federal Register 38(11), 1973) require that alternatives to a proposed project be developed, described and objectively weighed when significant resource trade-offs are involved. Alternative analyses are to allow an independent comparison of environmental and financial cost differences. The reasons why the proposed project is best must be stated.

A brief history of the project was described in the introduction to this report. Alternative wastewater treatment facilities for the Greater Globe-Miami area were previously described in the 1971 report by John Carollo Engineers. Resulting from their report, it was intended by local government to provide a regional wastewater treatment facility near the confluence of Pinal Creek and Miami Wash which could serve the major portion of the developed area by gravity flow. Subsequent to receiving an EPA grant offer, the regional concept was abandoned by Miami and Gila County. The project proceeded with Globe and Cobre Valley Sanitary District amidst considerable public complaint until EPA withdrew its support from the proposed treatment plant portion of the project to prepare this Environmental Impact Statement.

A principal, local objective related to the lack of consideration of alternative wastewater treatment projects which some members of the public believed to be more desirable. This statement describes in detail the wastewater treatment alternative recommended for implementation by John Carollo Engineers (1971), alternatives which were previously identified in the Carollo report and by local citizens as well as other alternatives developed during the preparation of this statement.

Although this report concentrates on alternatives for the treatment and disposal of wastewater, there are also a number of proposed improvements relating to the construction of local sewers and common interceptors. The 1972 report prepared by John Carollo Engineers entitled "Greater Globe-Miami Wastewater Project Report" describes in detail areas that may be sewered, the locations and diameters of pipelines and the cost. These non-grant fundable improvements are not contained herein except for general identification and costs that have been updated from 1972 to mid-1976.

Factors Influencing Alternative Development

In the development of the described alternatives there are certain institutional factors influencing facilities selection and cost estimates. The principal considerations influencing the development of alternatives for the Greater Globe-Miami project are:

1. P. L. 92-500, Federal Water Pollution Control Act Amendments of 1972.
2. EPA Secondary Treatment Information, Federal Register, Vol. 40, No. 159, August 15, 1975.
3. EPA Cost-Effectiveness Analysis Guidelines, Federal Register, Vol. 39, No. 29, February 11, 1974.
4. Arizona State Department of Health, Salt River Basin Plan.
5. Arizona State Department of Health and EPA, National Pollutant Discharge Elimination System (NPDES) Permit.
6. EPA Alternative Waste Management Techniques for Best Practicable Waste Treatment, Federal Register, Vol. 41, No. 29, February 11, 1976.

Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972, provides three dates which must be met by wastewater treatment planning as well as in the operation of wastewater treatment facilities. By July 1, 1977, all treatment facilities should be producing an effluent which meets EPA secondary treatment requirements. By July 1, 1983, all municipal treatment facilities should be providing what is referred to as Best Practicable Waste Treatment Technology. By July 1, 1985, municipal treatment facilities should have reached a condition of zero discharge of pollutants. This latter requirement is generally undefined and the nature of any future actions is uncertain.

The EPA "Secondary Treatment Information" defined effluent quality requirements for achieving secondary treatment and thus compliance with P. L. 92-500.

The EPA through its "Cost-Effectiveness Analysis Guidelines" provides a uniform method to calculate cost in all wastewater treatment project planning and they were used for the cost information in this EIS. These guidelines delineate the planning period to be utilized, the elements of cost which must be included, the method of handling prices for various components of the system, the interest rate which must be utilized, service life of various facilities, and salvage value to be utilized for the proposed works. They provide a method of comparing the costs of various alternatives within a given project, as well as the costs of any given project in a state. Therefore, while the monetary costs developed in the cost-effectiveness guidelines may not always represent the "true" cost of a project, they do present a uniform method for comparison of alternative projects.

Within the Draft Water Quality Management Plan for the Salt River Basin (Arizona Department of Health Services, 1975), the project generally described by John Carollo Engineers in their 1971 and 1972 reports was the favored plan for the Globe-Miami area. It was pointed out, however, that considerable public controversy had arisen over the site to be utilized in this plan and that further considerations may give rise to alternative plans. In essence, therefore, the Draft Salt River Basin Plan does not specifically recommend the plan which must be implemented in the Globe-Miami area. The Salt River Basin Plan does, however, recommend that all treated wastewaters reaching the Salt River at or below Pinal Creek be treated in a manner achieving 80 percent phosphate removal.

The Arizona Department of Health Services and EPA must review and certify a permit for wastewater discharge, the NPDES permit. Each wastewater discharger must possess a NPDES permit.

Regionalization

The objective of a regional system is to provide the most cost-effective solution for collection, treatment and disposal of wastewater in a given area. The term cost-effectiveness is comprised of three very important costs: monetary or dollar cost, environmental costs, and social costs. Within this chapter, only the monetary costs are considered because subsequent chapters describe the environmental and social impacts. The most cost-effective project is that project which has the lowest overall monetary, social and environmental cost to the project community. The use of common interceptors, a treatment plant and wastewater disposal for the project area was proposed in the 1971 report; and for those areas that are sewered, the plan was generally accepted by local governments. Several advantages can be attained by regionalization -- economics of scale in construction, wider distribution of costs, one operating authority for the treatment plant, easier inclusion of new residential and commercial developments into the system and ability to plan for use of basin as a whole. The principal disadvantage requires that local governments enter into joint powers agreement that extend local responsibilities beyond individual member control.

The extent of regionalization can be total or partial and may be done all at once or in stages. For example, regionalization may initially include Globe, Cobre Valley Sanitary District and Miami with later stages bringing in county improvement districts and lower Pinal Creek. The alternatives described generally deal with full regionalization for the treatment plant, except for sub-regional Alternatives 2A and 2B.

Flow and Waste Reduction Measures

Reductions in the amount of sewage entering the treatment plant and major interceptors may be decreased by local ordinances, operations and repairs. If reductions are made, capital and operating costs for the treatment plant are lowered. For example, if water supplies are metered, the sewage charge may be formulated on water use to cause a conservation in water use and thus reduce sewage. The connection of roof drains to sanitary sewers may be prohibited by ordinance; this will reduce peak flows during rains. Collection systems may also be repaired or replaced to reduce the infiltration of subsurface waters. In the Globe-Miami area, construction of the Phase II interceptor and some new collection systems is expected to greatly reduce infiltration to the treatment plant. No other flow reduction measures are proposed.

Proposed Facilities Common to All Treatment and Disposal Alternatives

Among the treatment and disposal alternatves, there is a system of collection and conveyance common to all. This section describes the general nature and cost of local improvement district and main interceptor facilities which are not dependent upon the location of the treatment plant(s) and therefore do not affect selection of a project from among the alternatives presented.

The 1972 John Carollo Engineers report entitled, "Greater Globe-Miami Wastewater Project Report", identified seven local improvement districts which can be formed to provide a financing vehicle for the construction of the collection system trunk mains (sewers on main streets) and lateral mains (sewers on side streets). House laterals, which are the sewers running from an individual dwelling to the sewer in the street, are the direct responsibility of the property owner. Table 12 summarizes for each of these

Table 12

SUMMARY OF PROJECTED IMPROVEMENT DISTRICT COSTS

Name of Improvement District	1972 Costs*	Projected Mid 1976 Costs**
Lower Miami and Claypool	$ 695,600	$1,174,900
Russell Gulch	611,700	1,033,200
Miami Wash	232,200	392,200
Sixshooter Canyon	351,900	594,400
Ice House Canyon	114,600	193,600
South Globe, Skyline, etc.	1,253,200	2,226,700
Central Heights	418,000	706,000
	$3,677,200	$6,211,000

* From "Greater Globe-Miami Wastewater Project Report", John Carollo Engineers, 1972.

** Cost expected to prevail in mid-1976.

improvement districts the 1972 costs as shown in the John Carollo Engineers report and a projected mid-1976 cost, a cost which is anticipated to prevail at the initiation of construction. The great increase in cost generally results from the general rise in prices attributed to inflation.

While the costs presented above are for mid-1976, it should be understood that construction of the treatment plant and major interceptor is not necessarily dependent upon the immediate sewering of all of these areas. Sewering of some areas may not be required for many years. Formation of an improvement district would require majority agreement among the members of that district as well as approval of a method by which financing and cost allocation to the participants would be accomplished. The cost for the various improvement districts is presented to generally indicate the magnitude of costs which would be involved in each general area and how these costs are increasing with time.

The local improvement district collection systems could contribute flow to the major pipelines or interceptors. Local trunk interceptors run through the middle of the collection system at the lowest elevation, such as along a stream bed, and contribute flow to interceptors carrying the flows from several improvement districts. The 1972 John Carollo Engineers report listed the cost of these interceptors, as shown in Table 13. Costs were projected to mid-1976, for those interceptors common to all alternatives.

Wastewater Management Options

Possible Alternatives

During the preliminary analysis of wastewater treatment/disposal needs several local features were decided to have limiting influences on the choice of available alternatives.

- Cost, capital and operating
- Land availability
- Operational complexity and reliability
- Social acceptability and aesthetics
- Impacts on surface and groundwaters
- Availability for reuse
- Serviceability for future growth
- Institutional constraints
- Known public issues

Table 13

PROJECTED COST OF INTERCEPTORS COMMON TO ALL ALTERNATIVE PROJECTS

	1972 Cost*	Projected Mid-1976 Cost**
Local Trunk-Town of Miami	23,000	34,100
Local Trunk-Lower Miami & Claypool	81,000	120,000
Local Trunk-Russell Gulch	114,000	168,800
Local Trunk-Sixshooter Canyon	179,000	265,100
Local Trunk-Icehouse Canyon	116,000	171,800
Local Trunk-Echo Canyon ,	61,000	90,000
Local Trunk-Central Heights	174,000	257,700
Highway 60/70 to Miami Ponds	155,000	229,600
From Gila Basin	88,000	130,300
Icehouse Canyon to Globe	66,000	97,800
Globe to Echo Canyon	114,000	168,800
Echo Canyon to Central Heights	310,000	459,100
	$1,481,000	$2,193,100

* From "Greater Globe-MiamiWastewater Project Report"

** Cost expected to prevail in mid-1976.

The order of listing has no bearing on importance. There are numerous options which fall into these general categories -- location of plant, treatment process and effluent disposal. Within these categories the options shown in Table 14 were identified, analyzed and evaluated for feasibility to finally select the alternative projects described in the subsequent section. The alternatives described comprise a combination of options from the three categories. During the analysis, certain alternative options were eliminated from consideration based on the following rationales:

1. Treatment plant site locations near Wheatfields would provide very little difference to the site proposed in the John Carollo Engineers 1971 report and thus would be redundant. Also, it is doubtful if land could be acquired for this use.

2. The use of trickling filters would constitute a situation similar to activated sludge in terms of cost, construction, mechanical operations and appearance, thus it would be redundant.

3. Oxidation ditches are a relatively new procedure in comparison to aerated lagoons and generally provide the same service as the aerated lagoon. Since land disposal is contemplated, the increase in cost relative to its increased merits did not seem justifiable. Also the mechanical operation is more complex than lagoons, thus the opportunity for failure is greater.

4. Evaporation requires a large land area and land is in short supply, also the evaporated water is removed from reuse in a water-short area.

The choice of possible plant site locations was made based on discussions with local interests, the availability of suitable acquirable land and probable adverse environmental impacts.

Treatment and Disposal Alternatives

The following selected treatment and disposal concepts are described to acquaint the reader with their general characteristics. Two distinct treatment concepts are being considered. One is "activated sludge" which is identified in the John Carollo Engineers reports as the contact stabilization process. The second is "aerated lagoon" treatment.

Table 14

EVALUATION OF POSSIBLE ALTERNATIVES

	Cost: Operating	Cost: Capital	Land Availability	Complexity of Operation	Reliability	Aesthetics	Surface Water	Groundwater	Available for Reuse	Meet Gravity Prospects	Institutional	Public Issues	Dropped from Alternatives
Treatment Plant Locations													
Near Globe - 2*	+	+	o	N/A	-	-	o	-	-	-	o	-	
Near Miami - 2	+	+	+	N/A	-	o	o	-	+	o	o	-	
Near Confluence of Pinal Creek and Miami Wash - 1	+	+	+	N/A	-	-	o	-	+	o	o	-	
Near Inspiration Consolidated Copper Company Smelter - 4	+	-	o	N/A	+	o	+	+	+	o	o	+	
Near Wheatfields - 5	o	-	-	N/A	-	-	o	o	-	+	o	-	X
Near Pringle Spring - 3	o	-	+	N/A	-	+	+	+	+	+	o	+	
Treatment Processes													
Activated Sludge	-	-	+	-	-	o	N/A	N/A	o	N/A	+	-	
Trickling Filters	-	-	+	-	+	o	N/A	N/A	o	N/A	+	-	X
Aerated Lagoons	+	+	+	+	+	o	N/A	N/A	+	N/A	o	+	
Oxidation Ditches	+	-	+	o	o	o	N/A	N/A	o	N/A	o	o	X
Effluent Disposal													
Directly to Pinal Creek - 1	+	+	N/A	+	+	-	o	+	-	N/A	o	-	
Spray on Land - 6	-	-	-	-	o	o	o	o	-	N/A	o	-	
Reuse by Mine Companies - 4	-	-	o	-	-	o	+	+	+	+	+	+	
Evaporation - 3	o	o	-	+	+	+	+	-	-	o	+	+	
Percolation - 1, 2, 3, 5	o	+	+	+	+	o	+	o	o	+	+	+	

* Refer to Figure 11 for Key Number.

Key:

- \- Negative action
- o Problematical benefits
- \+ Positive benefits
- N/A Not applicable
- X Dropped

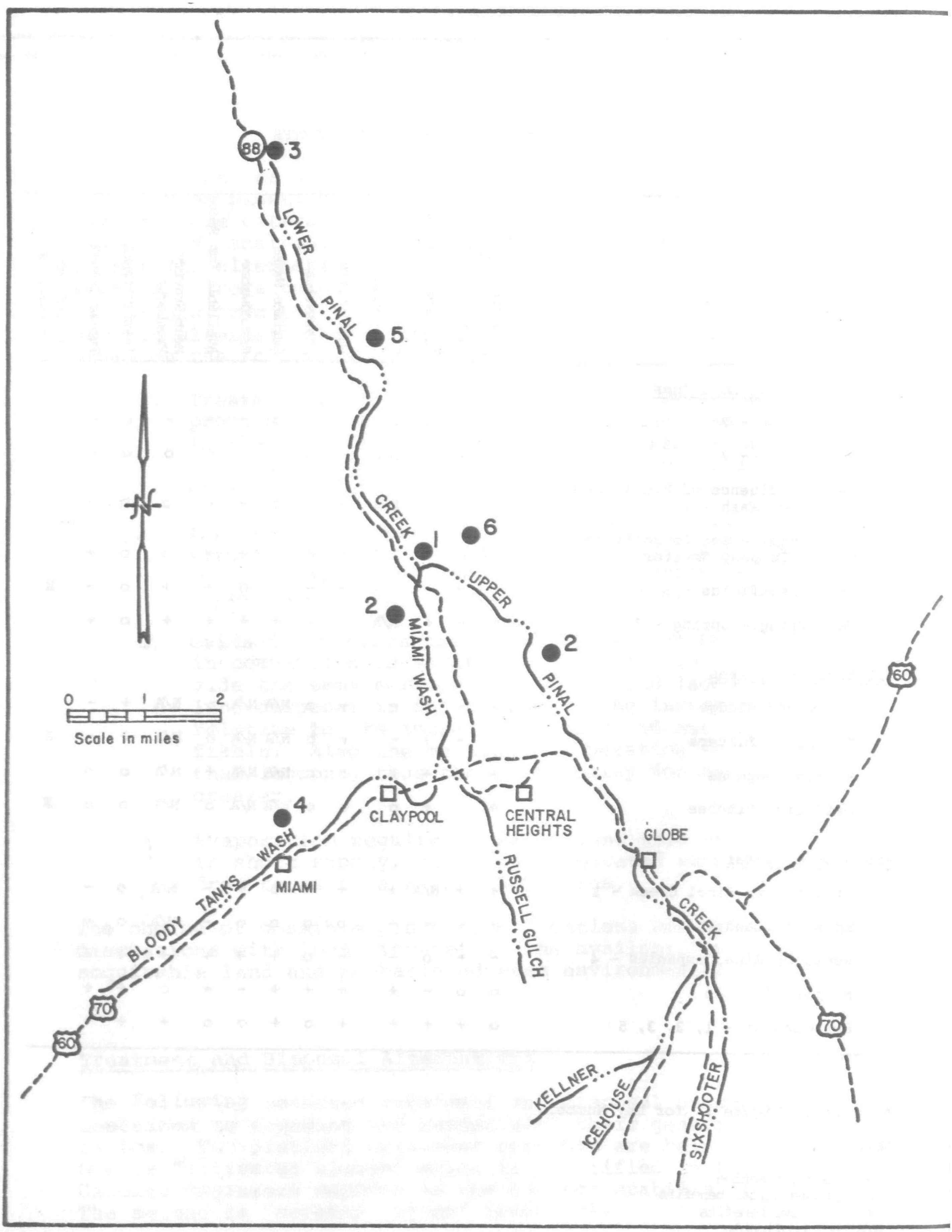


FIGURE II

ALTERNATIVE SCREENING SHOWING GENERAL SITE AND DISPOSAL LOCATIONS

Four separate treatment wastewater disposal concepts are considered. The first is percolation ponds, which operate by a combination of percolation into the groundwater basin and evaporation of the effluent. The second is spray irrigation upon National Forest Service or other lands, primarily for the purpose of effluent disposal. The third disposal concept is utilization of the effluent by either the City Service Copper Company or Inspiration Consolidated Copper Company, or a combination of the two. The fourth disposal concept is direct discharge to a dry creek or wash.

The Activated Sludge Process. The activated sludge process through the biological action of bacteria and other microbial cells breaks down and stabilizes the organic material present in the raw sewage. The activated sludge process consists of two separable treatments referred to as liquid handling and solids handling. Liquid handling consists of (1) screening; (2) aerated grit removal; (3) primary sedimentation; (4) aeration; (5) secondary clarification; and (6) chlorine contact (Figure 12). The screening removes at the inlet to the plant materials such as rags, boards, and other large objects which are detrimental to pumps and other equipment. Material removed by the screens is normally disposed of in an on-site landfill or by hauling to a sanitary landfill. Following screening, air is pumped into a chamber to continually agitate the raw sewage, while at the same time grit, which is similar to sand, settles to the bottom of the basin and is removed. The removed grit is normally disposed of on the plant site and would eventually amount to approximately 3 to 6 cubic feet per day. The next unit process is primary sedimentation where large pieces of organic material settle to the bottom of the clarifier tanks. These organic solids are removed from the tank and the remaining flow, which contains primarily dissolved organic material, enters the aeration basin. In the aeration basin, returning microorganisms (sludge) are added from the secondary clarifier (this is where the name "activated sludge" is derived), and the cells use the soluble organic material as a food supply, thus purifying the sewage.

Air is added to accelerate the growth rate of the bacteria. As the bacteria accomplish this stabilization of dissolved organics, they grow in number and must ultimately be removed from the sewage flow. Removal of the microorganisms is accomplished in the secondary clarifier where the microorganisms are settled and removed either to be returned to the start of the aeration basin (to activate the process) or are pumped to the solids handling operation. The above operations, i.e., transfer of solids and liquids, are critical to proper treatment of the sewage and must be constantly supervised. As the purified sewage leaves the secondary clarifier, it enters the chlorine contact chamber where chlorine is added for disinfection of the effluent. The chlorine

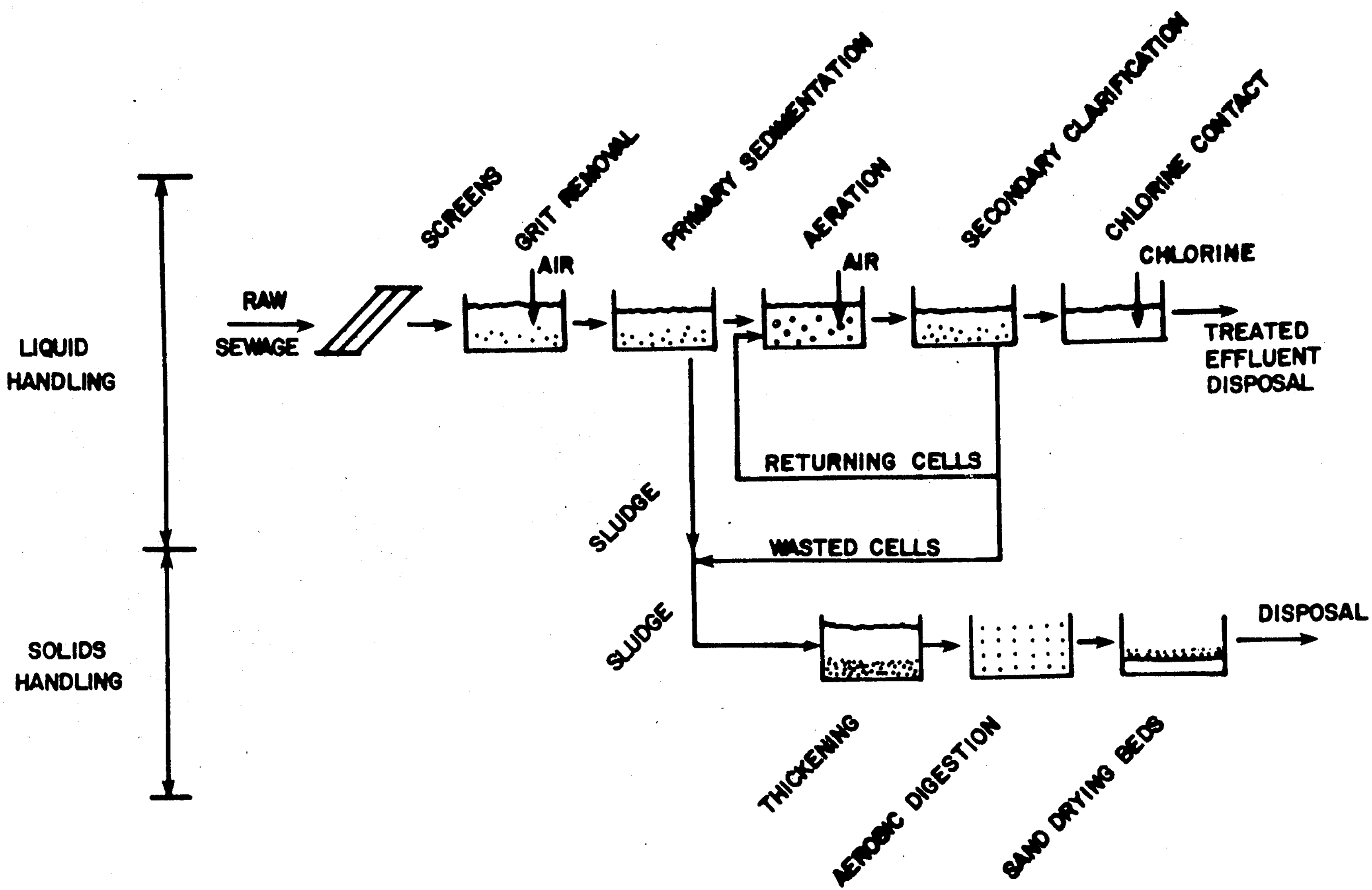


FIGURE 12: PICTORIAL FLOW DIAGRAM OF ACTIVATED SLUDGE TREATMENT

serves to disinfect the effluent by killing most of the bacteria and a significant portion of the viruses present in the treated effluent.

In the solids handling portion of the treatment, organic solids which were settled out in the primary and the secondary clarifiers of the liquid handling operation are degraded and further stabilized. This material is referred to as sludge. It is likely that the following operations would be used to treat the solids (sludge): (1) thickening; (2) anaerobic digestion; and 3) drying beds. Thickening compacts the sludge by removing water to lessen its overall volume. The thickened sludge is pumped to anaerobic digesters where bacteria and other microorganisms, which operate in the absence of oxygen, decompose and stabilize the sludge. The remaining material goes through a second anaerobic digester and is then put on sand drying beds where a humic-type soil results.

Operation of a 3 mgd activated sludge treatment plant would, according to the John Carollo Engineers reports, require up to ten men with the presence of at least one or two operators at all times. The advantages of the activated sludge process are the small amount of land required for the treatment plant, the production of a high quality effluent suitable for direct discharge to a wash, and a high degree of flexibility and reliability.

Figure 13 is a photo of a 5.5 mgd activated sludge plant located at Corona, California.

Aerated Lagoon. Aerated lagoons, as contrasted to activated sludge, have only a liquid handling phase. The first unit process screens incoming raw sewage as in the activated sludge process. (Septic tank pumper trucks would discharge their contents to a closed storage chamber for gradual addition to the sewage flow just before the screens.) The second process is the aerated lagoon which is a large open pond about 8 feet deep and holding about five days' inflow of sewage. Floating aerators are placed at several locations near the center of the pond. Aerators mix the pond contents and supply air (oxygen) to the bacteria in the pond which break down organic material as described in the activated sludge process. Following the aerated lagoon is a stabilization (maturation) pond (Figure 14). The purpose of the stabilization pond is to provide additional biological treatment often referred to as polishing. In an adequately-sized stabilization pond and with ample amounts of sunshine, there is a luxuriant growth of algae. This growth of algae is in itself a form of wastewater treatment since the algal cells utilize dissolved nutrients present in the pond water. Because algae cannot be readily removed from the pond water, the EPA definition of secondary treatment (maximum level of 30 mg/l of suspended solids) cannot be met, and discharge to a dry wash would be prohibited. This situation requires that the aerated lagoon treatment process utilize a land form of disposal such as spraying or percolation ponds.

There is no solids handling operation in the aerated lagoon process because all solids are degraded within the aerated lagoon or stabilization pond and are not removed for separate treatment. This results in a gradual buildup of humic soil on the bottom of the ponds, but ponds do not usually require cleaning more than once every ten to twenty years. The soil removed from the bottoms of such ponds in an excellent soil conditioner.

Operation of an aerated lagoon treatment plant is relatively simple as contrasted to activated sludge, because the only operation relates to maintenance of the aerators, maintenance of the pumps, and removal and disposal of the material screened out of the raw sewage. It is estimated that three to four persons would be required for the operation of a 3 mgd aerated lagoon treatment plant.

The basic advantages of aerated lagoon treatment are the relative simplicity of the treatment process and the relatively low cost of construction and operation of the facilities. The basic disadvantage of the process is that the effluent quality, as measured by EPA secondary treatment standards, is not as high as for the activated sludge process, thus precluding its disposal by open stream discharge.

Figure 14 shows a photo of aerated lagoons and stabilization ponds located at Coolidge, Arizona and Figure 15 shows a flow diagram for aerated lagoon treatment.

<u>Percolation Pond Disposal</u>. Percolation ponds are simply large open storage ponds from which treated effluent either flows to the groundwater basin by percolation or to the atmosphere through evaporation. The rate of percolation depends on the character of the underlying soil as well as the distance to the groundwater subbasin. The rate of evaporation depends primarily upon the wind velocity, the temperature of the water, and the temperature of the air. Figure 16 presents a photo of a typical percolation pond, one which is similar to that which would be utilized in any of the percolation alternatives. The basic advantages of percolation ponds are their relative low cost of operation, containment of an effluent on the treatment plant site, and replenishment of the groundwater basin. Disadvantages stem from the amount of land required and a possible degradation of the groundwater basin. Additional public health concerns relate to the consequences of any treatment plant failure.

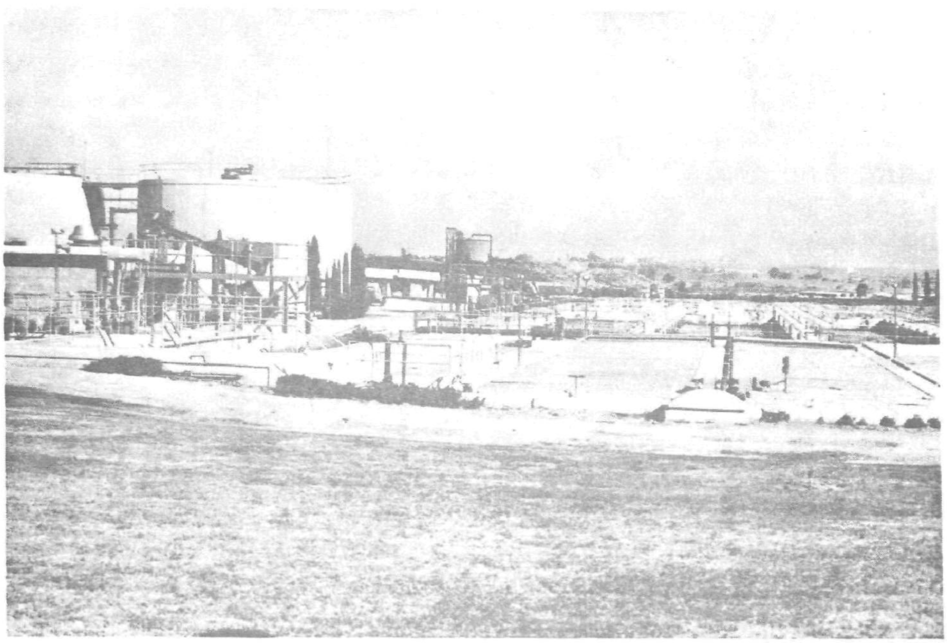


FIGURE 13

5.5 MGD activated sludge treatment plant, City of Corona, California.

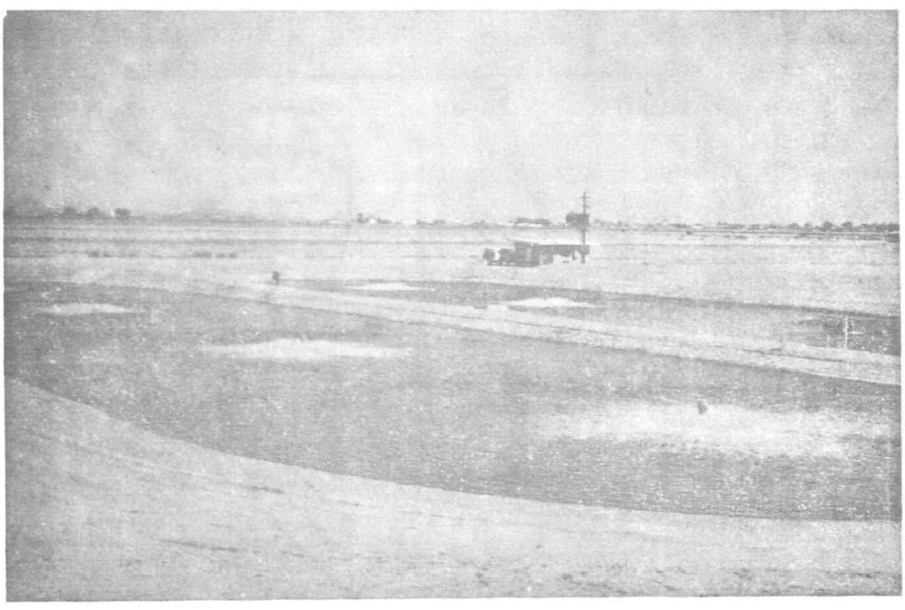


FIGURE 14

Aerated lagoon and stabilization pond, Coolidge, Arizona.

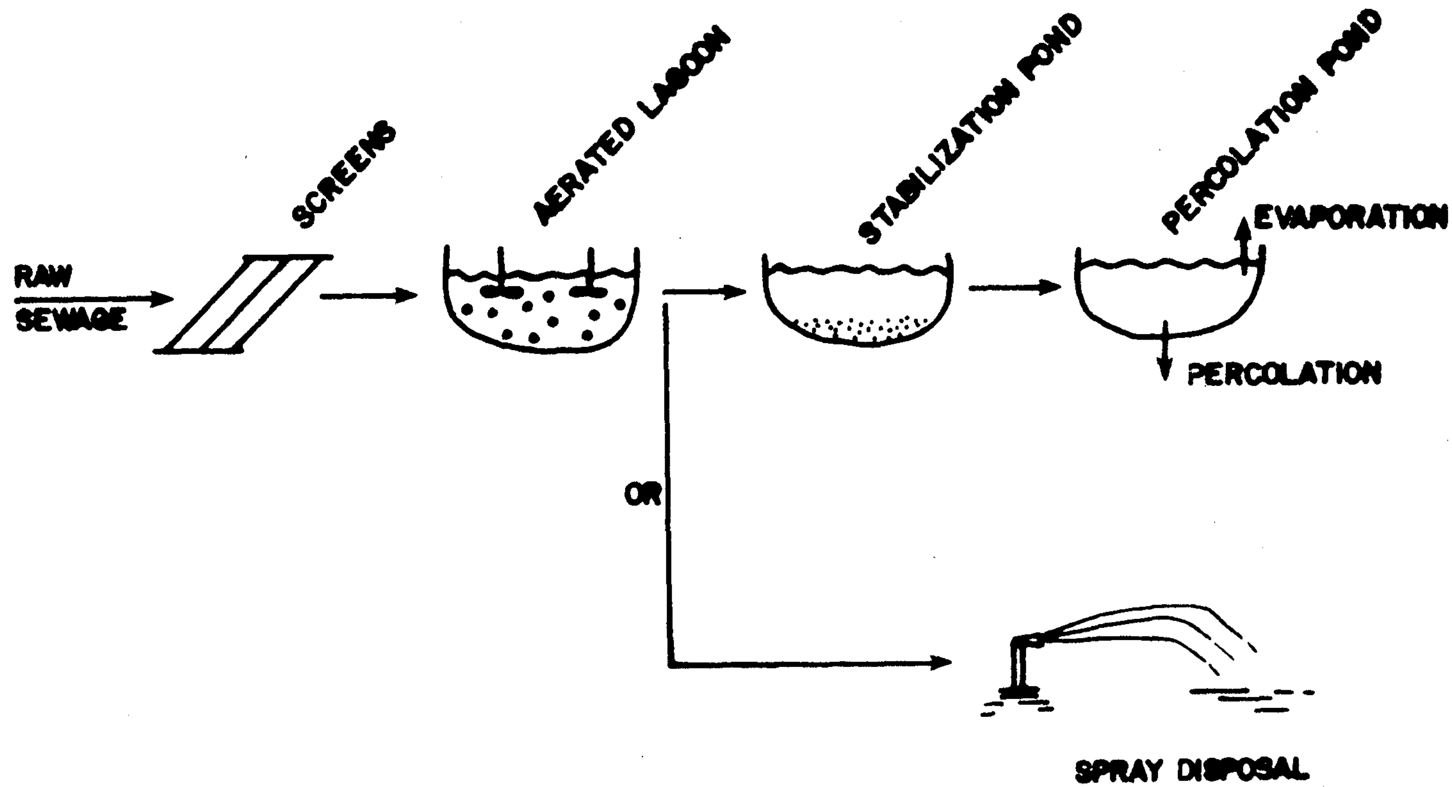


FIGURE 15: PICTORIAL FLOW DIAGRAM OF AERATED LAGOON TREATMENT

Spray Disposal. In the spray disposal of effluent from the treatment plant, treated wastewater is distributed using large impulse-type sprinklers, "rain birds", over open land. This is essentially an irrigation activity. Figure 17 shows a spray disposal field operated by Rossmoor Sanitation, Inc., Laguna Hills, California. A spray disposal system is normally designed for an application rate of about 0.3 of an inch per hour. It is common to rest certain portions of the spray disposal field for one to two days at a time, meaning that the gross application rate is actually somewhat higher than 0.3 of an inch per hour. The basic advantages are that effluent can be disposed of in a relatively remote area that does not have to be level. Also, disposal areas can be irrigated for grazing or certain crop productions. Disadvantages are that the effluent is lost by evapotranspiration, and there is subsequently little replenishment of the groundwater basin or other beneficial use of the water. There could also be both mechanical and public health problems in the event of treatment plant failure.

Copper Company Utilization. Several of the alternative projects could convey the treated wastewater to the copper companies for their reuse. In these cases the reclaimed water could be commingled with other water. Inspiration Consolidated Copper Company has recently indicated that it has concerns regarding the suitability of treated effluent for its production processes.

Direct Discharge to Creek. Effluent from an activated sludge process would meet EPA requirements for direct discharge to a creek or wash. The advantage of this method of disposal is its relatively low cost and lack of facilities except for an outfall pipe to deliver the effluent to the creek. The basic disadvantages relate to any adverse environmental impacts created downstream of the discharge, as well as a potential for adverse impact to human health in the event of treatment plant failure.

The initial screening of treatment plant location, process and disposal options resulted in eight seemingly viable wastewater facilities alternatives. Among these eight alternatives, some retained the existing Cobre Valley Sanitary District plant, while in others it was abandoned. Some of the alternatives make use of the existing Phase I interceptor, while others abandoned this existing facility. The remaining portion of this chapter describes in detail each of the eight viable alternatives showing a graphic description of the location of the various facilities, costs of the required facilities, and photographs of plant and disposal locations.

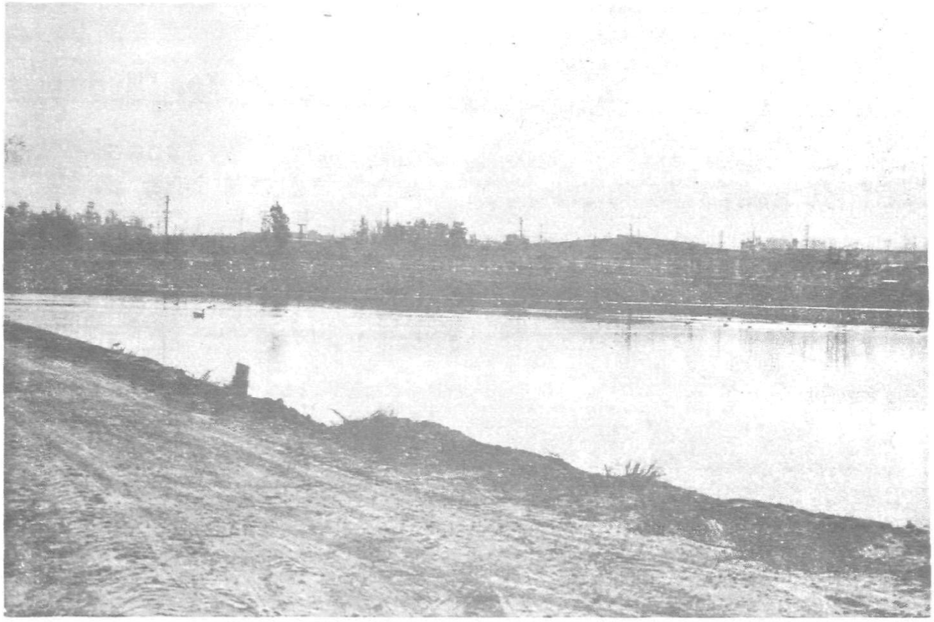


FIGURE 16

Typical percolation pond, City of Corona, California.

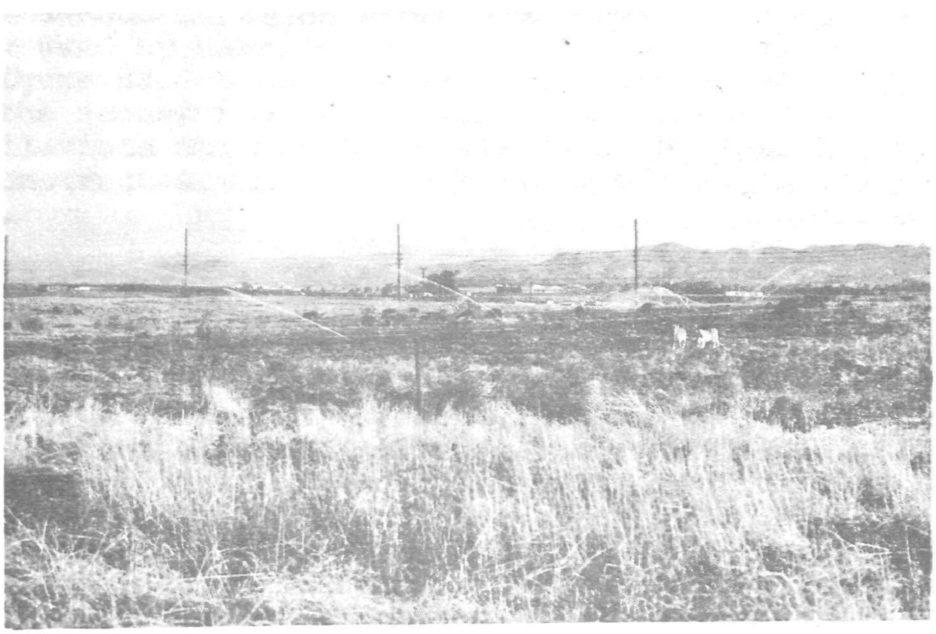


FIGURE 17

Typical effluent spray disposal operation, Laguna Hills, California.

Treatment Plant Site Options

Four prospective treatment plant sites were located along Miami Wash and Pinal Creek (Figures 18 through 21).

Site 1. This site is located south of Bixby Ranch, west of Bixby Road, north of the confluence of Pinal Creek and Miami Wash, and west of the Globe Hills. It occupies about 28 acres of land that slope toward Pinal Creek. The Globe Hills rise steeply on the eastern edge of the property. The vegetation (3 to 12 feet tall) consists predominantly of mesquite, cat claw, holocantha, prickly pear cactus, cholla cactus, golden bush and Datura. Cattle have removed most of the grasses and herbaceous plants. Kings Canyon Wash bisects and drains much of the site. There is no development on the property. The Bixby, Bejarano and several other residences are approximately 0.5 mile north of the site. This site is owned by the Inspiration Consolidated Copper Company and has been deeded to the City of Globe for a treatment plant site. An archeological survey produced no surface evidence of archeological importance on this area or any of the alternative treatment plant sites considered in this report.

On November 28, 1973, John Carollo Engineers presented a Flood Protection Analysis for this site to the Arizona State Health Department. This analysis forecasts a peak flow of 30,600 cfs for a 3-hour duration storm. A cross sectional area of Pinal Creek used by Carollo Engineers in this calculation is presented as Figure 22. Site 1 would be protected from a 100-year flood, but the access road which fords the channel would be impassable. To alleviate this problem, the City of Globe originally proposed to construct living quarters for the plant operators on this site.

Site 2. This alternative requires expansion of the Miami and Globe sewage lagoons at their present sites, i.e., additional land. Lands adjacent to the existing facilities are owned by the two copper companies.

Globe lagoon is about one mile north of the city east of and adjacent to Pinal Creek at its confluence with Big Johnnie Gulch. The creek at this point flows intermittently with creek water and effluent from the sewage lagoon. Several large cottonwood trees are located near the lagoon. About 6 acres of field corn is grown and irrigated with sewage effluent immediately north of the sewage lagoon. Cattle are also grazed in the corn fields after the corn is harvested.

Access to the sewage lagoon is by a dirt road following Pinal Creek. There are no residences within a mile of the sewage lagoon. Commercial developments are located along Highway 60 west of the lagoon.

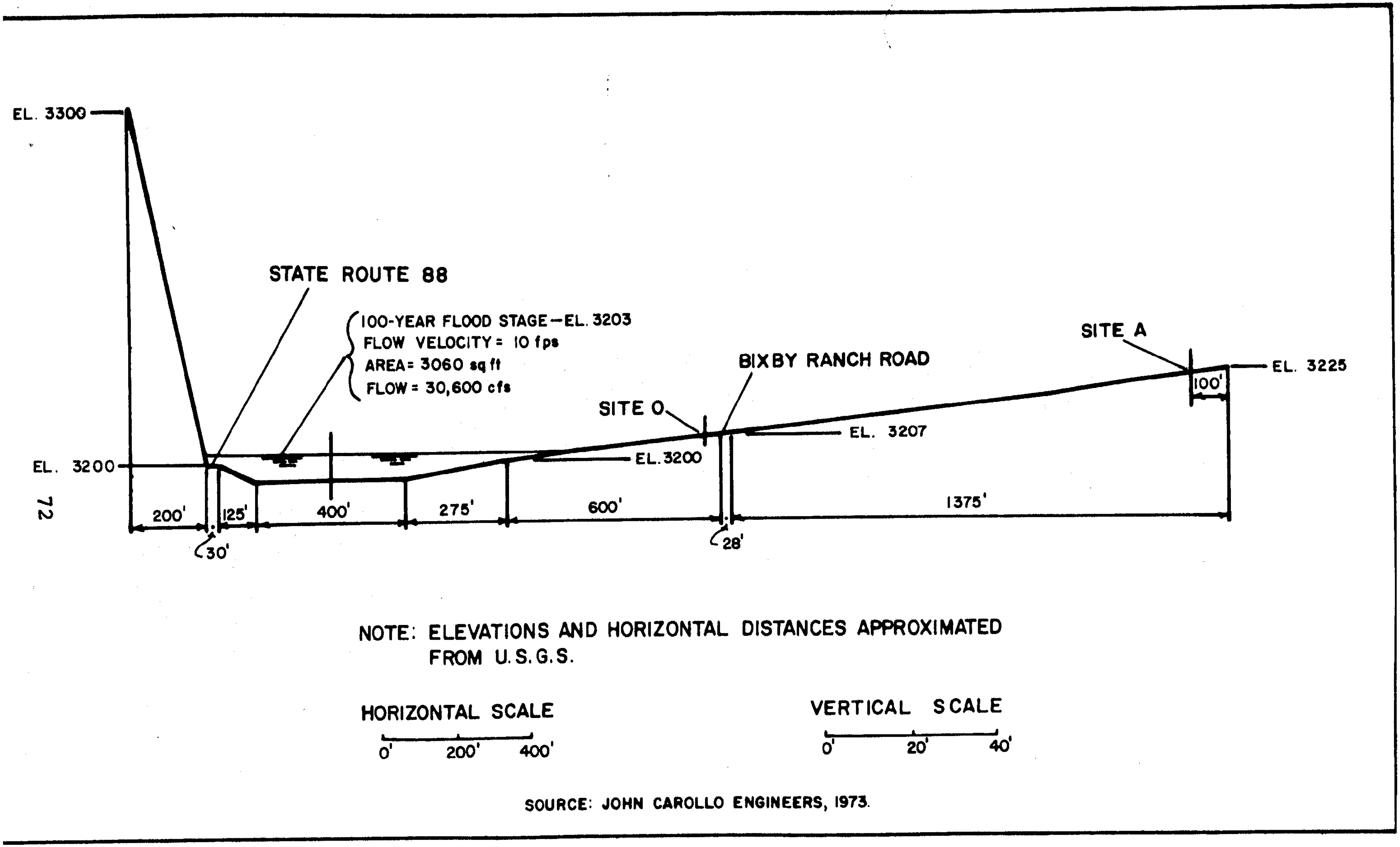


FIGURE 22

CROSS-SECTION OF PINAL CREEK LOOKING NORTHWEST

FIGURE 18

Site for treatment plant as proposed in Alternative 1. Bixby Ranch Road in foreground and Globe Hills in background.

FIGURE 19

Existing Globe sewage lagoon. Feasible site for expanded facilities as proposed in Alternative 2.

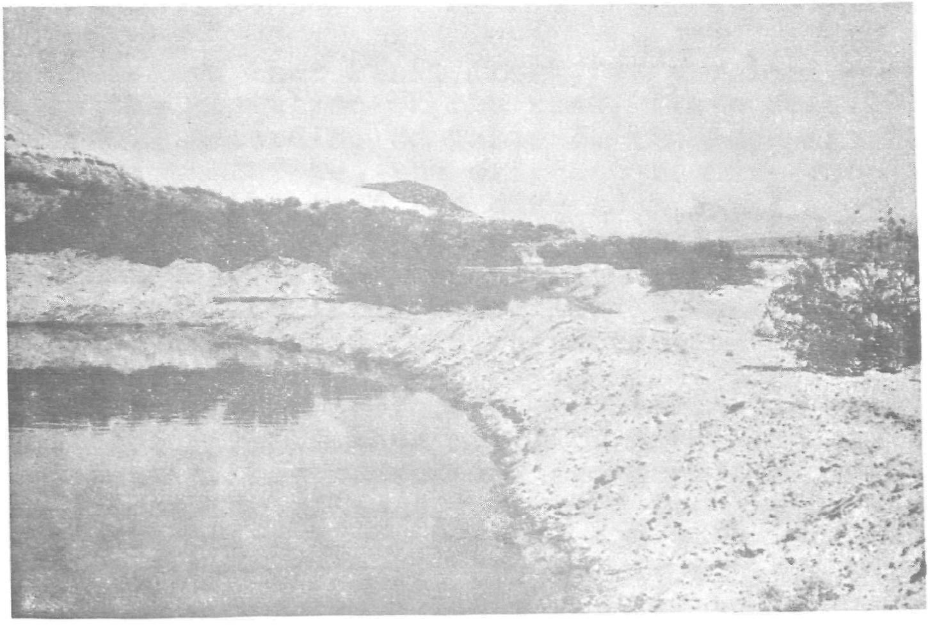


FIGURE 20

Existing Miami sewage lagoon. Feasible site for expanded facilities as proposed in Alternative 2 and Alternative 5.

FIGURE 21

Feasible sewage treatment site (Alternative 3) approximately 6.3 miles north of Bixby Ranch, on east side of Pinal Creek.

It is estimated that Pinal Creek, at a velocity of 17.7 fps and equal to the elevation of the road, flows at 8,700 cubic feet per second. According to Table 4, the 100-year flood level is 17,700 cfs; therefore, the existing roadway would be flooded. Realignment of the road and dike to a level about 8 feet higher would protect the site from a 100-year flood. Existing EPA regulations would allow construction of percolation ponds which are protected from 10-25 year flood stages. The main treatment plant facilities would require protection from a 100-year flood.

The Miami Lagoons (also noted as Site 2) lie along the west side of Bloody Tanks Wash north of Miami and are removed from all residential and commercial developments. The water level in the lagoons is presently about 5 feet below the top of the earthen dike which also channels the wash. Calculations indicate the channel may carry 15,200 cfs at an average velocity of 20 fps. Table 4 shows a 100-year flow in Miami Wash at Miami to be 13,400 cfs. If 6,000 cfs is added for the Russell Gulch contribution, the 100-year flow at Miami Lagoons would be 19,400 cfs which exceeds the estimated channel capacity. Consequently, the existing facility may be inundated by less than a 100-year flood and any new facility at this site would need a dike meeting EPA requirements. Percolation ponds could be constructed with a lower level of flood protection (10-25 year flood). Additional analyses and discussion on flooding at Site 2 is presented in Chapter V.

Site 3. This alternative site is located approximately 6.3 miles north of the Bixby Ranch on the east side of Pinal Creek Road. Definite boundaries are not established, but it generally encompasses about 33 acres of relatively level to rolling land dissected by small gullies. The Caretto ranch house is located across Pinal Creek Road from the site.

Vegetation on this site is similar to that found on Site 1; mesquite, cat claw, prickly pear cactus, cholla cactus and Spanish sword are the common species. Cottonwood trees are growing on the edge of Pinal Creek. The site is owned by the Inspiration Consolidated Copper Company and is presently used for cattle grazing.

Pinal Creek at this point is in a relatively wide valley. Perennial stream flow begins downstream from this site near the Pringle pump station. The site is located about 30 feet above the Pinal Creek bed and according to local residents (Hicks and Bixby, pers. comm.), above the historical floodplain.

Data are not available to calculate a 100-year flood for this location, but based on the 100-year flows given for upstream areas, it was estimated to be about 35,000 cfs. Calculations indicate that Pinal Creek could carry a flood flow of 135,000 cfs at this location without reaching the level of the road to Pringle; therefore, Site 3 would not need protection from the 100-year flood.

Site 4. This alternative site would be located on Inspiration Consolidated Copper Company property near the smelter or acid leaching plant. Its location, although not precisely known, would probably be in an area already disturbed by development. Lack of a definite site precludes a description of its environment.

Implementation Options -- Financing and Organization

A variety of facilities are described: treatment plants, outfalls, interceptors, and local collection sewers. However, perhaps equally important to the technical and environmental aspects which are considered are the following questions.

1. How will the facilities be paid for?
2. How will the cost of these facilities be allocated to residents within the project area?
3. How will the facilities be operated?

In addition to the physical facilities, there are various methods of accomplishing the above which must be dealt with before a project is operational, and consequently these subjects should be in mind while reviewing the alternatives and their environmental impacts.

The first question -- how will the facilities be paid for -- should be discussed first. This project is a part of EPA's Construction Grants Program, and as such the Federal Government, via EPA, would pay for 75 percent of eligible treatment, disposal and interceptor facilities costs. The remaining 25 percent is the local share which may be paid for in part by the state. It should be noted that the purchase of land is normally not an eligible cost and would not be paid by EPA. Percolation ponds may, however, qualify as an eligible cost. The local collection systems would ordinarily be financed 100 percent by local residents, although there are federal grants which can apply. In considering possible methods of financing, consideration must be given to the City of Globe, the Town of Miami, a sanitary district -- Cobre Valley -- and a relatively large area which is presently unincorporated. The incorporated areas could finance their share of the required facilities, using revenue bonds or general obligation bonds issued upon the obligation of the incorporated areas to repay the incurred principal and interest. Revenue bonds and accrued interest are repaid from revenue collected for the services provided. Several financing vehicles could be made available to the unincorporated areas. At the present time, there is one sanitary district encompassing the unincorporated area, the Cobre Valley Sanitary District. This district could be expanded to include all remaining unincorporated areas where sewerage is needed; or a new sanitary district could be formed either encompassing the Cobre Valley Sanitary District and the remaining portion of the unincorporated areas, or simply encompassing those unincorporated areas not in the Cobre Valley Sanitary District. Regardless of which method is selected, local improvement districts could be formed within the sanitary district(s) to pay for collection sewers. In Appendix I, facilities and costs for seven local improvement districts have been outlined as originally presented by John Carollo Engineers in their 1972 report. The local improvement districts could be organized to construct and pay for necessary local collection sewers while the sanitary district as a whole could be responsible for payment of interceptor sewers, treatment and disposal facilities.

The next question is how could the cost of the various facilities be allocated among the incorporated and sanitary district(s) areas; and within these entities, what would be the cost to individual residents. Before these questions can be answered, an adequate Revenue and Repayment Program must be prepared for the project area and thereafter approved by both local interests and EPA. An EPA required aspect of any revenue program is that all charges must be on a "fair and equitable" basis. This means that all residents would pay for services in a manner directly attributable and proportional to the cost of the services provided. No one entity could be charged more or less than another entity for an identical service. If an unequitable agreement were approved on a local level, it would not be approved by EPA. The allocation of costs for treatment and disposal to commercial uses is often based on a formula relating to metered flow, BOD, and suspended solids. For domestic sewage, it would more than likely be based only on average flow contributed to the system. The costs for interceptors would probably be allocated on a design peak flow basis. The local entity cost for interceptors would be allocated on their peak flow contribution.

Allocation of costs for collection sewers, constructed by local improvement districts, could be based on a number of methods, including front footage of lots, total assessed valuation of lots, land value, lot acreage, or on a per housing unit basis. Whatever method is finally implemented has to be approved by those persons residing within the local improvement district.

The third question is how would the facilities, constructed as a portion of this project, be operated. A number of organizational configurations can be evaluated for the operation of facilities. A joint powers agency could be formed comprised of the City of Globe, the Town of Miami, Cobre Valley Sanitary District and any other sanitary district(s) which may be formed. The joint powers agency would then let contracts and employ those persons needed for operation and maintenance of the system. Another alternative could be for the City of Globe to operate the facilities and charge the other entities for their allocated operation and maintenance costs. A third alternative would be for the Town of Miami to operate the facilities, and a fourth possibility would be for the sanitary district(s) formed for the unincorporated areas to operate and maintain the treatment facilities. Another possibility coupled with Alternatives 1-A and 4, where the copper companies use the effluent directly, is to form joint powers contracts for a copper company to operate and maintain the treatment facilities. If this were done, one of the above arrangements would have to be consummated for the operation and maintenance of the major interceptors and local collection systems. Just as importantly as the allocation of capital cost is the allocation of operation and maintenance costs. Regardless of the method selected for operation of facilities, again, the allocation of operation and maintenance costs must be on a "fair and equitable" basis.

Important also is that prior to any EPA construction grant award for facilities, the exact method upon which the facilities would be financed, the manner in which costs would be allocated, and the method in which the facilities would be operated and maintained has to be contractually agreed to among the user entities.

Description of Evaluated Regional Treatment and Disposal Alternatives

Alternative 0 -- Existing Wastewater Treatment Facilities

In Alternative 0, no grant fundable action would be taken to change the present methods and locations of sewage treatment and disposal. Limited modifications would be undertaken to upgrade the performance of the existing treatment facilities. Effluent from the treatment facilities would continue to be disposed by the methods presently utilized.

This alternative is not considered to be viable for several important reasons. First, effluent quality of the Globe and Miami treatment facilities would violate the present NPDES discharge requirements. In addition to being an environmentally undesirable situation, enforcement proceedings would likely be initiated by EPA and/or the State of Arizona. Secondly, since no expansion of treatment facilities would occur, additional growth in the sewered portions of Globe and Miami would probably be prevented or minimized by bans on new connections to the existing treatment facilities. In addition, the formation of local improvement districts to provide sewers in unincorporated areas would probably be prohibited.

There are eight municipal and private wastewater treatment facilities in the project area. These facilities serve only a portion of the population; septic tanks and a few cesspools are used by residents not connected to the sewer system. The existing treatment facilities and their location in the study area are shown in Figure 23. The Globe, Miami and Cobre Valley plants serve major segments of the population, while the package plants serve some small, private developments. A summary of the design characteristics of the existing plants is given in Table 15.

City of Globe. The Globe wastewater lagoon located on Pinal Creek about one mile north of the city is 6 to 7 acres in size and receives an estimated waste flow of 0.78 mgd. Monitoring reports indicate the pond is discharging about 0.5 to 0.75 mgd. This difference is not explained. In addition to municipal wastes, septic tank contractors have dumped septic wastes into the ponds at a rate of 15,000 gallons per week (John Carollo Engineers, 1972). These ponds are severely overloaded with sewage. The pond produces an objectionable strong sulfide odor. Part of the discharge is used by a farmer to irrigate crops and pasture located near the ponds. The remainder of the discharge is to Pinal Creek. The effluent is turbid, foamy and non-chlorinated. Recent efforts have been made to temporarily improve the situation at the Globe lagoons.

Cobre Valley Sanitation District-Central Heights. This treatment plant is a 200,000 gpd (0.2 mgd) "oxigest" package plant. It was designed to service approximately 100 trailers, 175 houses and a supermarket in the Central Heights area; however, only a few of the prospective residences are connected. The present metered flow rate is 15,000 gpd. The plant operates intermittently because of the low loading and discharges a chlorinated effluent into an unnamed wash tributary to Pinal Creek.

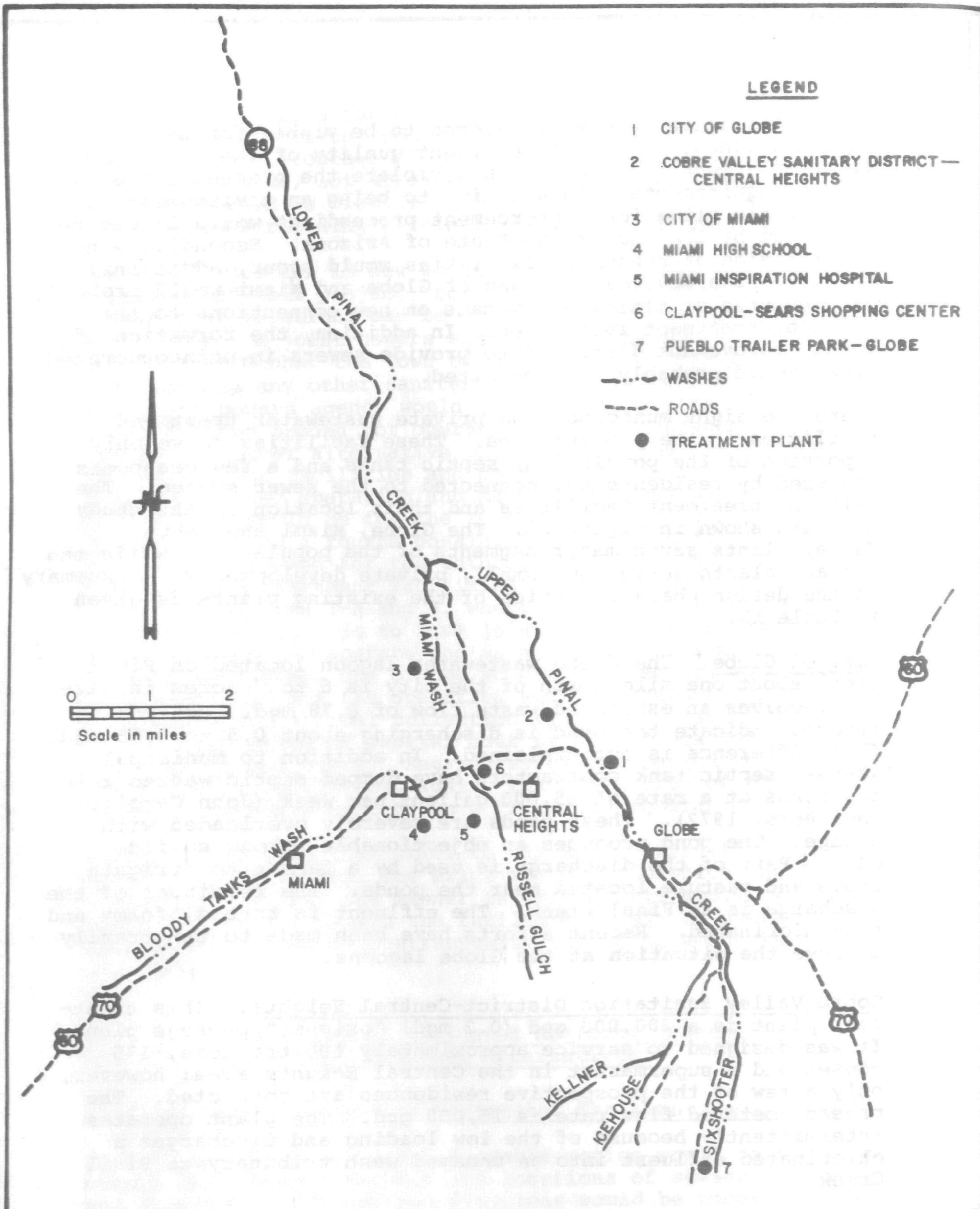


FIGURE 23: EXISTING TREATMENT FACILITIES IN GLOBE-MIAMI AREA

SOURCE: EARLE V. MILLER ENGINEERS, 1975

Table 15

SUMMARY OF DESIGN CHARACTERISTICS OF TREATMENT PLANTS LOCATED IN STUDY AREA

	Type of Plant	Design Capacity	Approx. Current Inflow	Discharge Point	Comments	Owner	Year of Construction
1. City of Globe	Oxidation ponds, 6 acres	200,000 gpd	780,000 gpd	Pinal Creek & irrigation	Poor effluent, odors	Municipal	
2. Cobre Valley Sanitary District	Packaged plant	200,000 gpd	15,000 gpd	Dry wash (tributary of Pinal Creek)		City of Globe	1974
3. Town of Miami	Oxidation ponds, 6 acres	150,000 gpd	250,000 gpd	Miami Wash	In floodplain	Municipal	
4. Miami High School	Packaged plant	20,000 gpd	20,000 gpd	Bloody Tanks Wash		School district	1966
5. Miami Inspiration Hospital	Packaged plant	15,000 gpd	30,000 gpd	Russell Gulch	Good operation, counteracts overload	Private	1965
6. Claypool - Sears Shopping Center	Packaged plant	20,000 gpd		Russell Gulch	Maintenance by hospital operator	Private	1974
7. Pueblo Trailer Park, Globe	Packaged plant	20,000 gpd	Varies	Sixshooter Canyon	Poor effluent, odors	Private	1968
8. Inspiration Consolidated Copper Company	Oxidation pond			Webster Lake (industrial reuse)		Private	

Source: Modified from Earle V. Miller Engineers, 1975.

Town of Miami. The Town of Miami operates a series of four oxidation ponds totalling about 6 acres on the east side of Miami Wash. This plant has a design capacity of 0.15 mgd and receives an estimated inflow of 0.25 mgd. The average discharge from the ponds is about 0.14 mgd. The Miami ponds like the Globe ponds are overloaded and are producing a poor quality effluent. The effluent is discharged to Miami Wash.

Unsewered Areas. A portion of the incorporated area is unsewered. Septic tanks and some cesspools are still the most common form of sewage disposal in older sections of Globe and Miami. Winneberger (1970) reported that approximately 260 housing units in Globe use septic tanks or cesspools (10 percent of total units serviced), while in Miami, 58 housing units are on septic tanks or cesspools (6 percent of the total units served).

The unincorporated areas of Claypool, lower Miami and Wheatfields and much of Central Heights are on septic tanks. Many septic tanks are malfunctioning because of poor location and failure of leach fields, especially in the Central Heights area. These tanks are periodically pumped with the septic wastes going to the Globe lagoons. Inadequate septic tank capacity in some areas of Central Heights and Claypool has resulted in residents discharging wash water and other nonfecal wastes into gutters and washes (Croft, pers. comm.).

Alternative 1-A -- Regional Activated Sludge Treatment/Copper Company Reuse

Alternative 1-A is the collection and treatment of raw sewage at a central location (the junction of Pinal Creek and Miami Wash) as proposed by John Carollo Engineers in their reports. Figure 24 illustrates the major facilities required for Alternative 1-A, as well as their general locations. Figure 18 presents a photograph of the location for the sewage treatment plant.

The routing for the raw sewage interceptor for the Globe, Central Heights, Skyline, Ice House Canyon, and Sixshooter Canyon areas is generally along Upper Pinal Creek. Raw sewage from Miami, Claypool, and Midland City would be conveyed through an interceptor down Miami Wash to the proposed regional treatment plant. This interceptor routing would allow gravity flow for all sewage originating in Upper Pinal Creek and Miami Wash. Raw sewage originating in the Wheatfields area would be collected at a pumping station located immediately below the area of the existing development and pumped through a force main to the regional treatment plant.

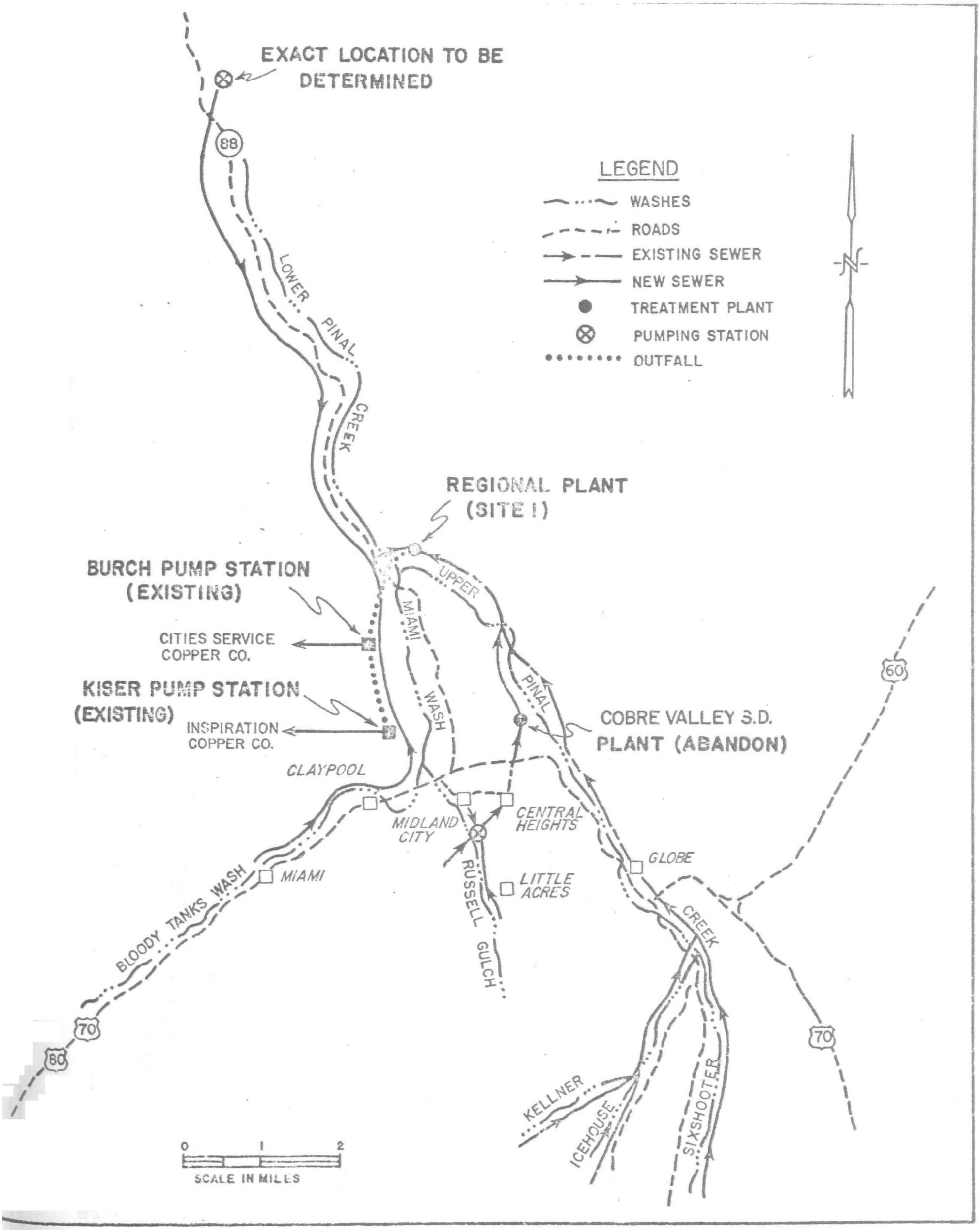


FIGURE 24

ALTERNATIVE I-A — REGIONAL ACTIVATED SLUDGE TREATMENT PLANT. DISPOSAL BY COPPER COMPANY REUSE.

The regional, activated sludge treatment plant would initially be sized to treat 2.4 mgd, but would require expansion in about 1986 to 2.8 mgd to meet needs until 1996. About 10 acres of land would be required for the treatment plant and related on-site facilities.

In Alternative 1-A, the effluent would be used by either the Cities Service Copper Company and/or the Inspiration Consolidated Copper Company. Equalization would be utilized to maintain a fixed average pumping rate throughout the day and thus minimize both energy requirements and the size of the pipeline through which the effluent is pumped. From the regional treatment plant, the treated effluent would be pumped from the flow equalization storage site through a force main running south, parallel to Highway 88 and terminating at the Inspiration Consolidated Copper Company Kiser Pumping Station. This pipeline would pass adjacent to Cities Service Copper Company's Burch Pumping Station and a provision could be made to divert effluent to the Burch Pumping Station. At these pumping stations, the copper companies could mix the effluent with their other water supplies and pump it to their points of usage. Delivery of effluent to the two copper company pumping stations would represent the termination of the proposed wastewater project. Contractual agreements would have to require that the industrial users take all the effluent at all times.

Inspiration Consolidated Copper Company has recently indicated concern over the quality of the treated effluent. The company further objects to any requirement that it take all effluent at all times.

Alternative 1-A has a 1976 present worth cost for capital and annual expenditures over a 20-year period of $6,968,700. A summary of these costs as well as the computation of the present worth is presented in Appendix J. The present worth value is the amount of money which would be required to be in a fund in 1976 to construct and operate the described facilities until 1996, without the collection of additional funds. In computing the present worth cost, an effluent charge to the copper companies of $20 per acre-foot was used. This was the value suggested by John Carollo Engineers in their 1972 report, but the actual amount that the effluent could be sold for would have to negotiated with the copper companies.

A breakdown of the 1976 and 1986 capital expenditures is presented in Appendix J and summarized in Table 16 (page 101), respectively. In addition, interceptor and collection system facilities, which are common to all alternatives and that were previously discussed, would be required.

Alternative 1-B -- Regional Activated Sludge Treatment -- Spray Disposal

In Alternative 1-B, raw sewage would be collected in an identical fashion to Alternative 1-A. Raw sewage from the Central Heights, Globe, and Upper Pinal Creek would be conveyed by gravity down Upper Pinal Creek, and raw sewage from the Miami, Claypool, and Midland City areas would be conveyed by gravity down Miami Wash to the confluence of Miami Wash and Upper Pinal Creek. Raw sewage from Wheatfields would be pumped to the south, up Pinal Creek to the proposed regional treatment plant site. The proposed treatment plant site No. 1 is near the confluence of Miami Wash and Upper Pinal Creek.

The treatment process would be the activated sludge process and identical to that used in Alternative 1-A. In 1976, a 2.4 mgd capacity plant would be constructed and enlarged by 0.4 mgd in 1986.

The mode of effluent handling and disposal is the principal difference between Alternatives 1-A and 1-B. In Alternative 1-B, effluent flow would be pumped from an equalization reservoir to a spray disposal field located east of the plant site in the Tonto National Forest. Figure 25 shows the location of the principal interceptors, the treatment plant and the effluent pumping station. The spray disposal field would require approximately 14.3 acres to the east of plant site No. 1.

Alternative 1-B has a 20-year period, 1976 present worth for construction and operation of $7,183,800. A breakdown of this cost in terms of capital expenditures and annual expenditures for principal components is presented in Appendix K. These expenditures relate to facilities which are not common to all of the alternatives. The previously discussed interceptor and collection system facilities which are common to all alternatives would also be required and add to the total cost.

Alternative 1-C -- Regional Activated Sludge Treatment -- Lower Pinal Creek Discharge

Alternative 1-C is identical to Alternatives 1-A and 1-B in regard to collection of raw sewage, location of the treatment plant, and type of treatment process. Alternative 1-C differs from 1-A and 1-B in the method and location of effluent discharge. Effluent would be discharged directly to Pinal Creek, immediately below its confluence with Miami Wash. This alternative is essentially the project proposed by John Carollo Engineers in their 1971 and 1972 reports, and the alternative upon which some design work has been completed. Figure 26 shows the locations of the principal interceptors, the treatment plant, the pumping station, and point of disposal.

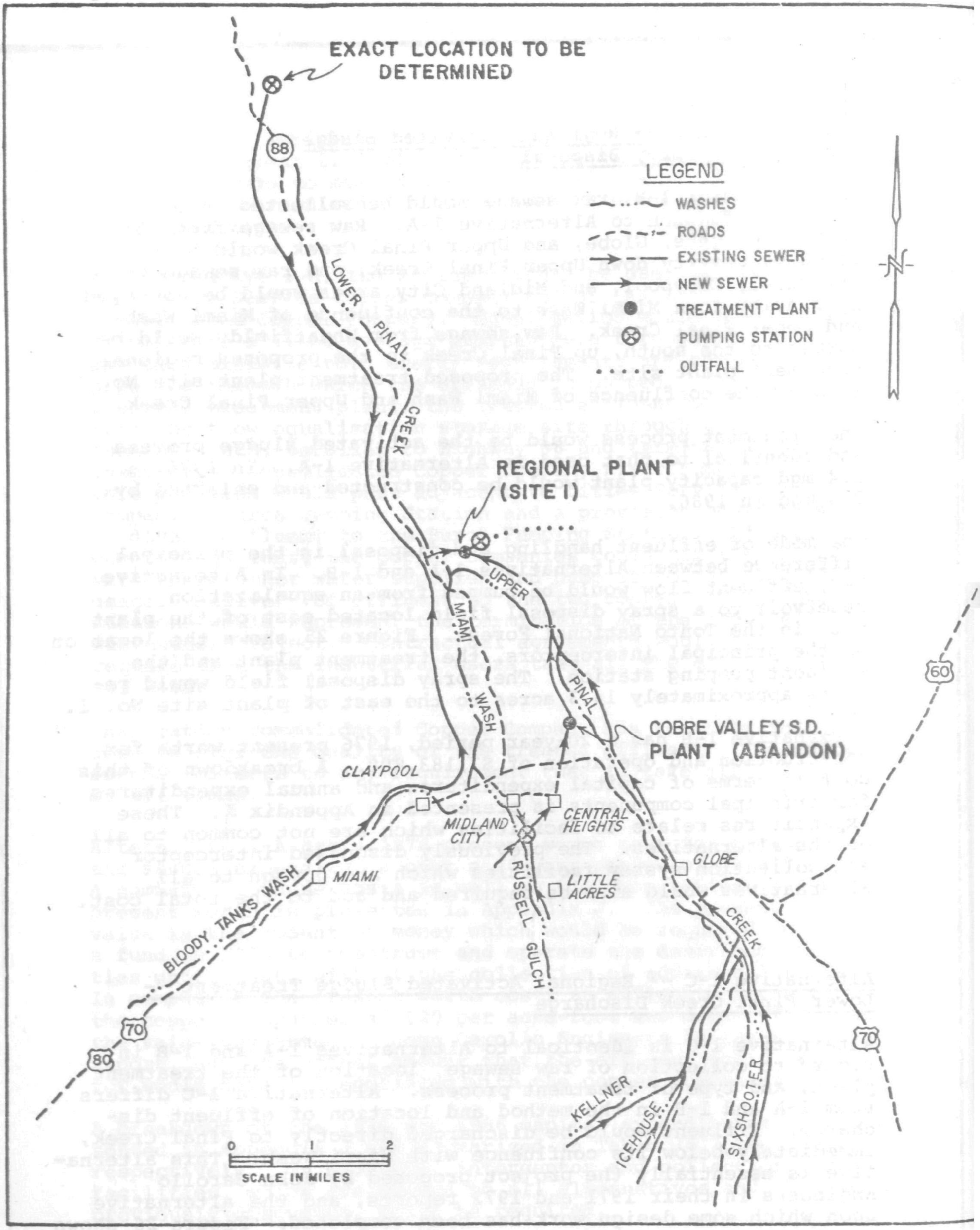


FIGURE 25

ALTERNATIVE I-B — REGIONAL ACTIVATED SLUDGE TREATMENT PLANT. DISPOSAL BY SPRAY IN THE TONTO NATIONAL FOREST.

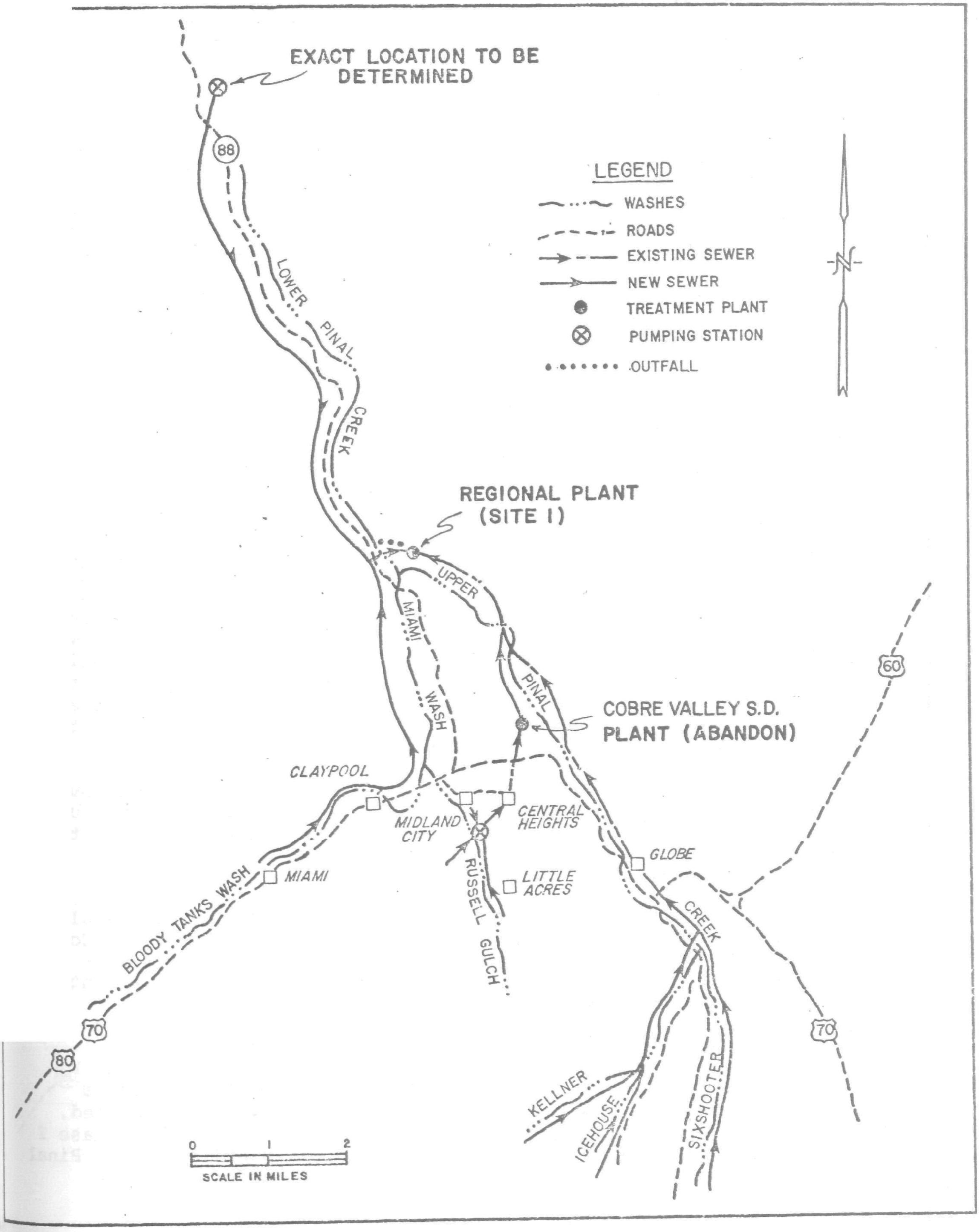


FIGURE 26

ALTERNATIVE I-C — REGIONAL ACTIVATED SLUDGE TREATMENT PLANT. DISPOSAL TO LOWER PINAL CREEK.

Alternative 1-C has a 20-year period, 1976 present worth for capital and annual expenditures of $6,494,800. A summary of capital and operating costs and computation of the 1976 present worth is presented in Appendix L. The present worth cost is somewhat less than Alternatives 1-A and 1-B because only a short outfall pipeline is required for effluent disposal, as compared to the more structural facilities in 1-A and 1-B. The cost of interceptors not common to all alternatives and the collection system facilities must be added to arrive at a total project area cost.

Alternative 2-A -- Sub-Regional Aerated Lagoons -- Percolation Pond and Direct Creek Discharges

In Alternative 2-A, three treatment plants would be used to accommodate regional needs. Two treatment plants would be aerated lagoons and one would be the existing Cobre Valley Sanitary District treatment plant. Raw sewage from the Miami, Claypool, Midland City areas would be conveyed to an aerated lagoon treatment plant located at the existing Miami lagoons site (Site 2). The new aerated lagoon facilities would occupy about 20 acres and have a treatment capacity of 0.8 mgd. Raw sewage from the Wheatfields area could be pumped by two stations to this treatment plant. One pumping station would be near the north end of the existing development in Wheatfields, and the second would be at a location approximately halfway between the lower pumping station and the Miami aerated lagoons.

The City of Globe and areas tributary to Upper Pinal Wash would also be served by an aerated lagoon treatment plant which would be constructed on about 25 acres in the general vicinity of the existing Globe treatment plant. The 1976 capacity would be 1.4 mgd with expansion to 1.9 mgd in 1986.

Both the Miami and Globe aerated lagoon treatment plants would use percolation ponds for effluent disposal. The existing Cobre Valley Sanitary District plant would be maintained, and discharge would be continued to the nearby dry wash. This plant would have to be doubled in capacity in 1986.

Figure 27 shows the general locations of interceptors, the pump stations and the three treatment plants. Photographs in Figures 19 and 20 show the general environmental features where the new aerated lagoon treatment plants would be placed. It should be noted that in this alternative the existing Phase I interceptor extending from the confluence of Miami Wash and Pinal Creek to the City of Globe lagoon would be abandoned.

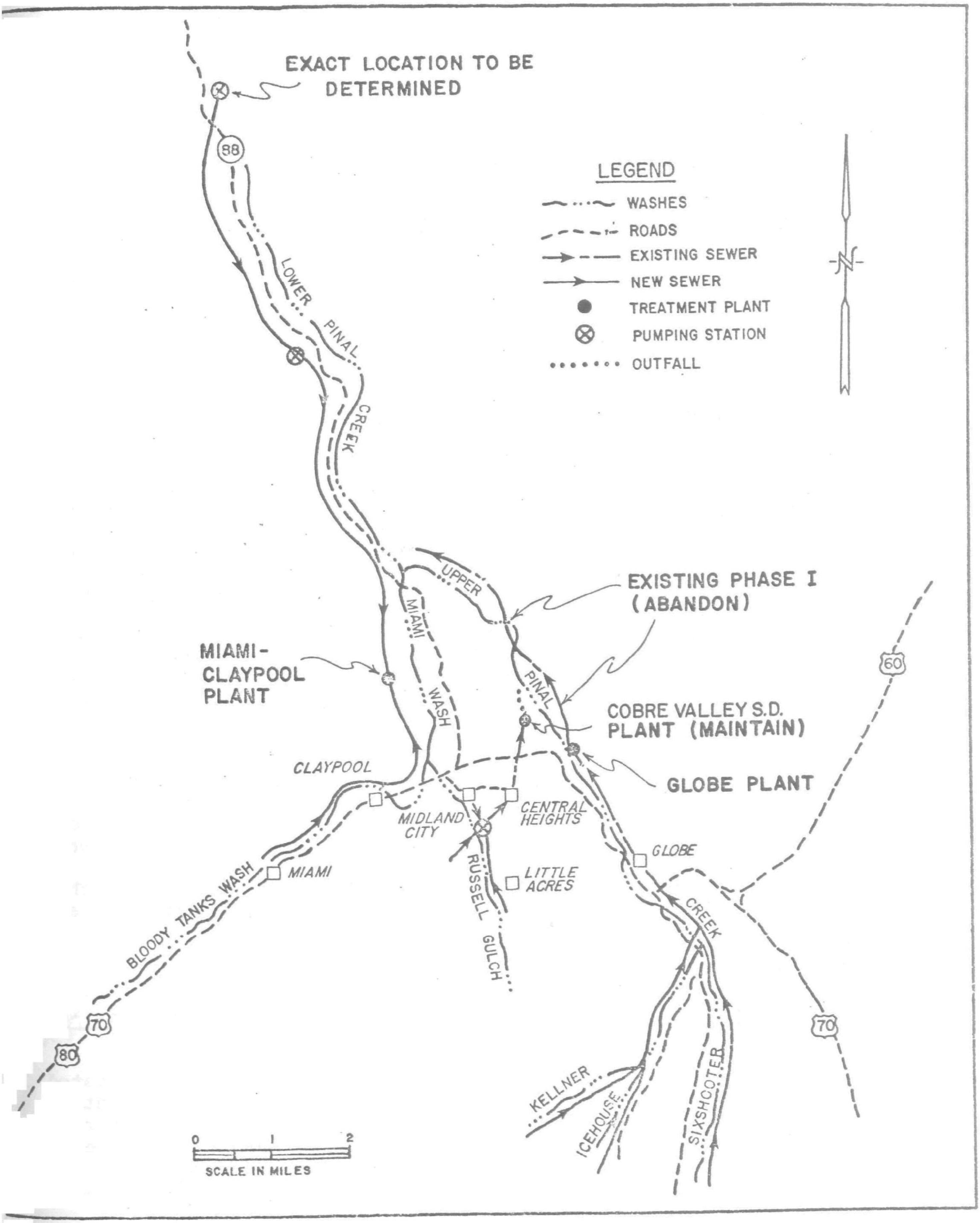


FIGURE 27

ALTERNATIVE 2-A — SUB-REGIONAL AERATED LAGOONS. DISPOSAL TO PERCOLATION PONDS.

Alternative 2-A has a 20-year period, 1976 present worth for capital and annual expenditures of $2,499,800. A summary of the capital and operating costs as well as the computation of the present worth is presented in Appendix M. It should be noted that the cost for 2-A is substantially less than Alternatives 1-A, 1-B or 1-C principally because of the lower costs for aerated lagoon treatment plants. The cost of the collection system and interceptors not common to all alternatives must be added to the alternative cost.

Alternative 2-B -- Sub-Regional Aerated Lagoons -- Spray Disposal

Alternative 2-B is identical to Alternative 2-A except for the method and location of effluent disposal. In Alternative 2-B treated wastewater would be disposed of by spraying on the land. Effluent from the Globe aerated lagoon treatment plant and the existing Cobre Valley Sanitary District plant would be combined at the junction of Pinal Creek and the wash leading down from the Cobre Valley treatment plant. At this confluence, a pumping station would be constructed and effluent would be pumped in a northeasterly direction into the National Forest for spray disposal on approximately 10.8 acres of land. Effluent from the proposed Miami aerated lagoon treatment plant would be pumped to an area between Miami Wash and State Highway 88 and then sprayed on approximately 3.9 acres of land. Figure 28 illustrates the major facilities required for Alternative 2-B, as well as their general location.

Alternative 2-B has a 20-year period, 1976 present worth for capital and annual expenditures of $3,136,900. A breakdown of the capital and operating costs as well as the computation of the 1976 present worth is presented in Appendix N. In addition to these treatment and disposal facilities costs, the cost of the interceptor and collection system not common to all alternatives must be added.

Alternative 3 -- Regional Aerated Lagoons Below Wheatfields -- Percolation Pond Discharge

In Alternative 3, the regional treatment plant would be located in the lower Wheatfields area north of any existing residential developments. The proposed location is in the southwest portion of section 6 and approximately one-half mile north of the Setka property. Raw sewage from the Globe area and upstream

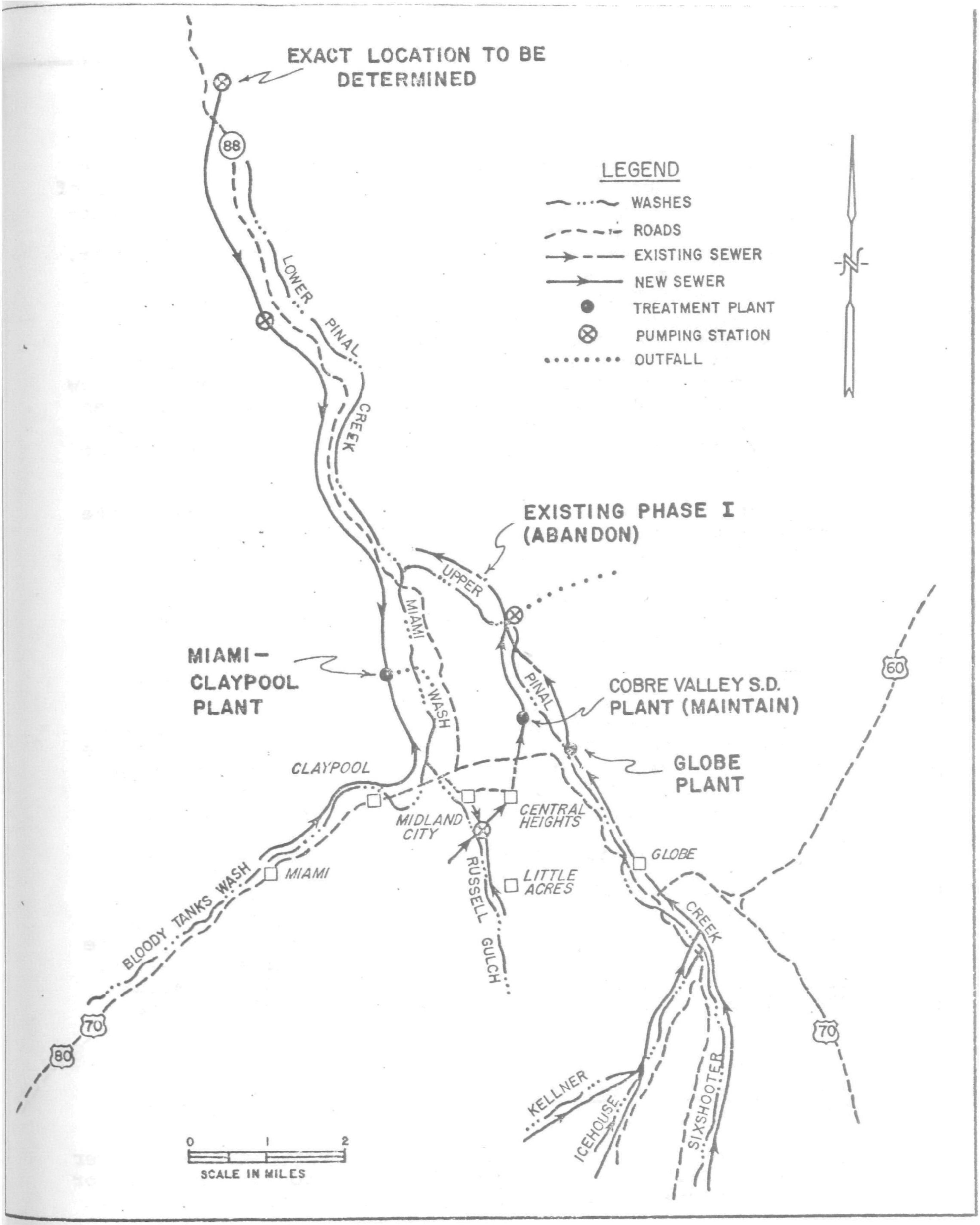


FIGURE 28

ALTERNATIVE 2-B — SUB-REGIONAL AERATED LAGOON DISPOSAL BY SPRAYING ON LAND.

tributaries to Pinal Creek would be conveyed through the new and existing Phase I raw sewage interceptor to the junction of Miami Wash and Pinal Creek. The existing Cobre Valley treatment plant would be abandoned with raw sewage from that system being conveyed to the Pinal Creek Phase I interceptor. Raw sewage from the Miami-Claypool area would be conveyed to the junction of Miami Wash and Pinal Creek, using existing and proposed new raw sewage interceptors. From the junction of Pinal Creek and Miami Wash, raw sewage would be conveyed in a single raw sewage interceptor about 7 miles north by gravity to the treatment facilities. In this alternative raw sewage from the Wheatfields and lower Pinal Creek area, when it is sewered, could be conveyed to the regional treatment plant by gravity. Figure 29 illustrates the location of the major facilities required.

The location of the aerated lagoon treatment plant is in the southwest portion of section 6, on the east side of Pinal Creek. Figure 21 presents a photograph of the area of the proposed treatment plant. The aerated lagoons would be followed by stabilization ponds and percolation ponds for disposal of effluent. Approximately 33 acres would be required for the treatment facility.

Alternative 3 has a 20-year period, 1976 present worth for capital and annual expenditures of $3,465,200. Appendix O presents a breakdown of the capital and annual expenditures required over this 20-year period and the computation of the present worth value. The total capital costs of treatment facilities required in 1976 is $3,131,500, and the total capital costs of facilities required in 1986 is $140,400.

During the formulation of this alternative and subsequent discussions with property owners in the Lower Wheatfields area, a great deal of thought and discussion went into how far down Pinal Creek the treatment plant should be located. Certainly, there appears to be no reason for the plant to be farther north than presented in this alternative. However, it should be noted that this interceptor would cost about $285,100 per mile of length in the lower Wheatfields area.

Alternative 4 -- Regional Activated Sludge Treatment -- Copper Company Reuse

Alternative 4 was developed to eliminate any controversy over possible impacts of a treatment facility upon any existing or possible future residential and commercial areas. In

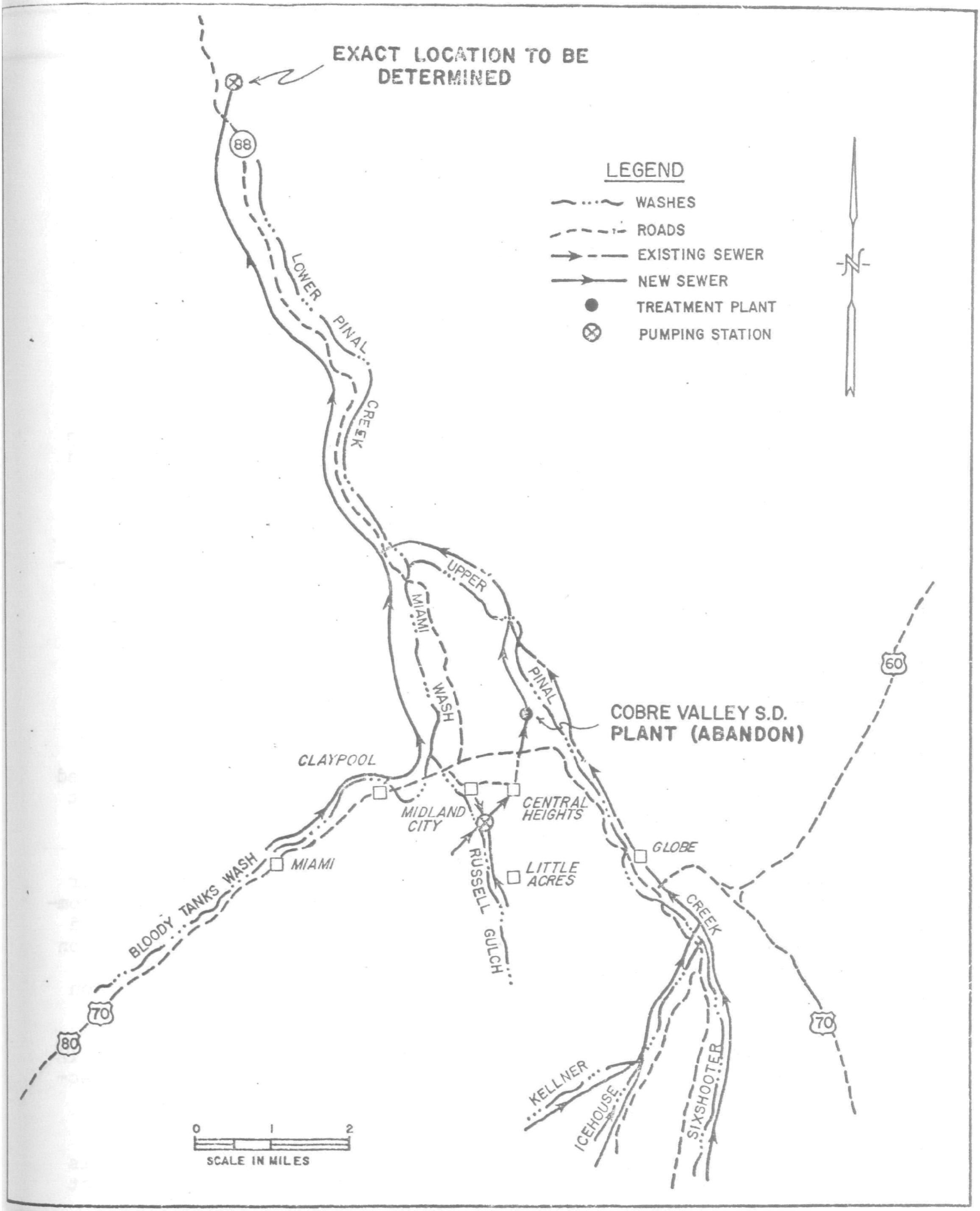


FIGURE 29

ALTERNATIVE 3 — REGIONAL AERATED LAGOONS BELOW WHEATFIELDS. DISPOSAL TO PERCOLATION PONDS.

Alternative 4, the treatment plant would be located on Inspiration Consolidated Copper Company property in the general vicinity of the existing smelter. Raw sewage from Globe and other areas tributary to Pinal Creek would be conveyed to the junction of Pinal Creek and Miami Wash and pumped through a force main generally paralleling Highway 88, to the general area of the existing Miami Ponds. At this point, flows from Miami and Claypool would be connected at a pumping station which would pump raw sewage through a force main generally following Miami Wash, Highways 60/70, and Inspiration Road to the next pump station. Final design engineering should consider the possibility of moving this second pumping station farther south to eliminate some piping as well as to conserve energy by minimizing the lift required for Miami and Claypool raw sewage. The third and final pumping station would be located on Inspiration Road, leading up to the Inspiration Consolidated Copper Company. The exact location of this pumping station would be determined during final design engineering. It should be noted that this alternative requires a substantial length of force main to convey sewage to the treatment plant as well as four separate raw sewage pumping stations. Figure 30 illustates the major facilities required to implement Alternative 4, as well as the general location of these facilities.

The treatment process would be activated sludge treatment which has been described in a previous section. The treated wastewater would be used by Inspiration Copper Company, and represent approximately 15 to 33 percent of the water utilized by this company. The location of the treatment plant has not been definitively selected because this would be done by Inspiration Copper Company after they determine the exact point of effluent delivery. It may be possible that the effluent could be utilized for one particular process, or as in Alternative 1-A, it may be more economical to simply commingle the reclaimed water with other existing water utilized by Inspiration Consolidated. As previously noted, Inspiration Consolidated Copper Company has some unresolved concerns regarding the suitability of treated effluent in its production processes.

In the past, there have been objections to any alternatives in which a copper company would reuse the effluent. These objections have generally centered around the inability and/or refusal of the copper companies to accept delivery of the effluent while they are on strike or closed down for other reasons. A key assumption in development of Alternative 4 is that the Inspiration Consolidated Copper Company would accept

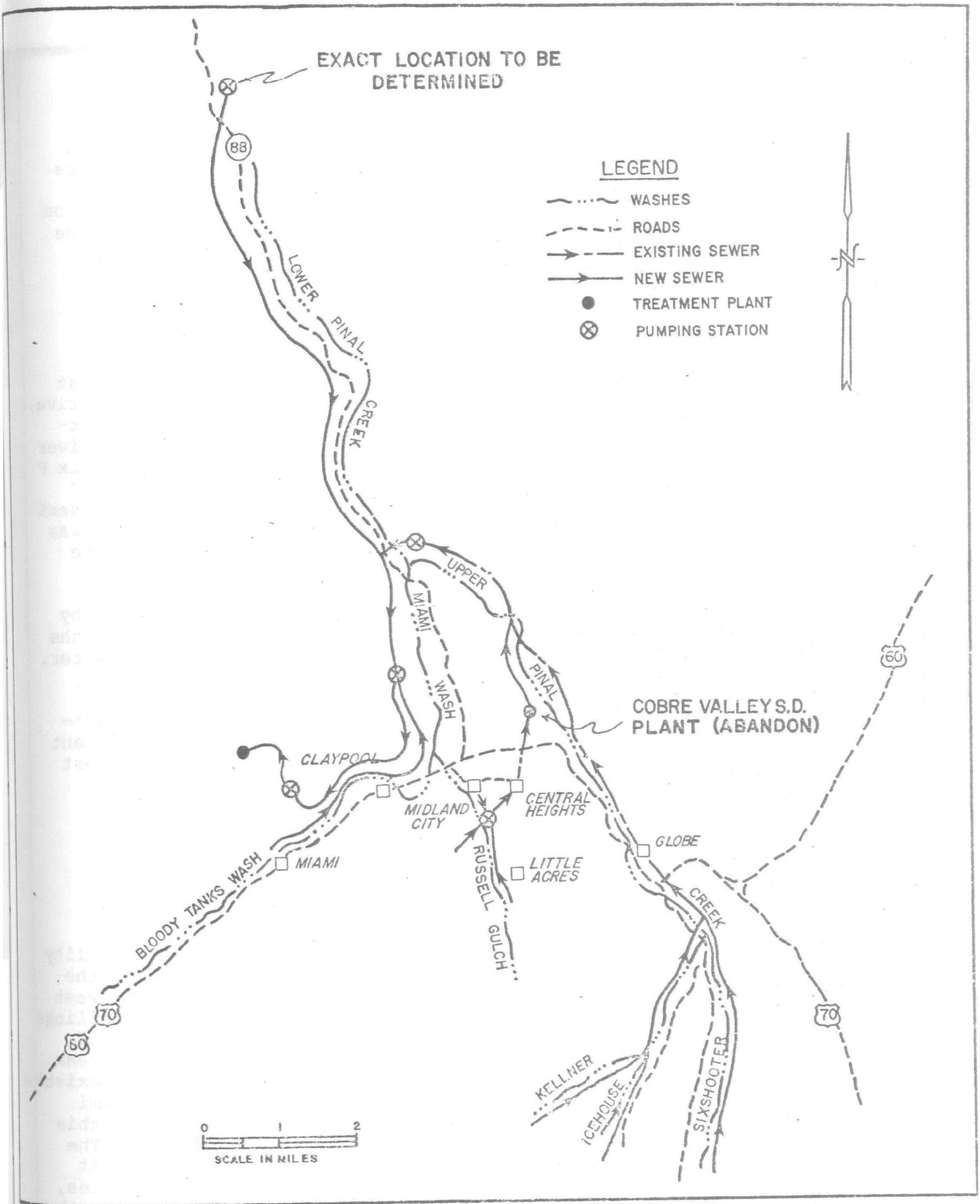


FIGURE 30

ALTERNATIVE 4 — REGIONAL ACTIVATED SLUDGE TREATMENT & REUSE AT INSPIRATION CONSOLIDATED COPPER COMPANY.

the treated effluent to a suitable location in the event of a strike or other plant shutdown. There are a number of factors involved in this alternative which would require substantial negotiation: the location of the treatment plant, the location of the force main facilities for conveyance of raw sewage, the price of the effluent as delivered to the copper companies, the charge for water to the copper companies during a plant shutdown, and the mode of effluent disposal during a plant shutdown.

Alternative 4 has a 20-year period, 1976 present worth for construction and annual expenditures of $8,847,800. This cost is substantially in excess of the cost for any other alternative, principally because of the cost of the activated sludge treatment plant, the force main and three pumping stations to deliver raw sewage to the proposed treatment plant location. Appendix P presents a breakdown of the capital and annual costs required over this 20-year period and the calculation of the 1976 present worth. As in Alternative 1-A, a value of $20 per acre-foot was utilized for the reclaimed water, a value which would require negotiation to determine.

Recognition should be made of preliminary testing conducted by Inspiration in conjunction with this statement to determine the compatibility of their flotation process and treated wastewater. This testing indicated that reclaimed water is not as satisfactory in the flotation concentration operation as their existing water supplies. If additional treatment must be provided by Inspiration, this may lessen the value of the effluent as a saleable commodity. In addition to these costs, the cost of interceptors common to all alternatives plus the cost of local collection systems must also be considered.

Alternative 5 -- Regional Aerated Lagoons at Existing Miami Lagoon Site

In Alternative 5, the regional aerated lagoon treatment facility would be located adjacent to Miami Wash in the vicinity of the existing Miami treatment lagoons. This location is on the west side of Miami Wash, between Miami Wash and Inspiration's tailings pond No. 5, and approximately one and one-half miles north of Highways 60/70. Raw sewage from the City of Globe and upstream areas of Pinal Creek would be conveyed through new and the existing Phase I interceptors to the junction of Pinal Creek and Miami Wash. Flow from Central Heights would also be conveyed to this location through existing Phase I interceptor facilities. The existing Cobre Valley treatment plant would be abandoned. At the termination of the existing Phase I interceptor facilities, a pumping station would be constructed to pump raw sewage to the new regional aerated lagoons. A pumping station would be constructed in the lower Wheatfields area below any existing development, and raw sewage from Wheatfields would be pumped through a force main, generally paralleling Pinal Creek, to the previously identified pumping station located at the junction of Pinal Creek and Miami Wash. The combined flow would then be pumped south, up Miami Wash to the regional aerated lagoon facility. Figure 31 illustrates the location of the major facilities required in Alternative 5.

The regional aerated lagoons would be identical to those described in Alternative 3. The aerated lagoons would be followed by stabilization ponds and percolation ponds for disposal of the effluent. Approximately 33 acres of land would be required for the aerated lagoon treatment facility.

Alternative 5 has a 20-year period, 1976 present worth cost for capital and annual expenditures required of $2,817,600. A summary of these costs, as well as a computation of the present worth is presented in Appendix Q. The total capital cost of facilities required in 1976 is $2,110,800, and the total capital cost of facilities required in 1986 is $140,400. In addition to these costs, the previously discussed interceptor and collection system facilities, which are common to all alternatives, would also have to be constructed.

Summary

Eight feasible alternatives have been developed and presented in this chapter for treatment of raw sewage and disposal and/or reuse of the treated effluent. For each alternative, a 1976 present worth cost was developed for construction and operation of required facilities over a 20-year period to 1996. The 1976 present worth and a breakdown of capital and annual costs of these eight alternatives is given in Table 16.

In addition, a number of interceptors which are common to all alternatives and local collection sewers common to all alternatives would also be required. The estimated cost of these facilities, if construction is initiated in mid-1976 is summarized in Table 17. At this time the application of federal funds to those costs is undefined.

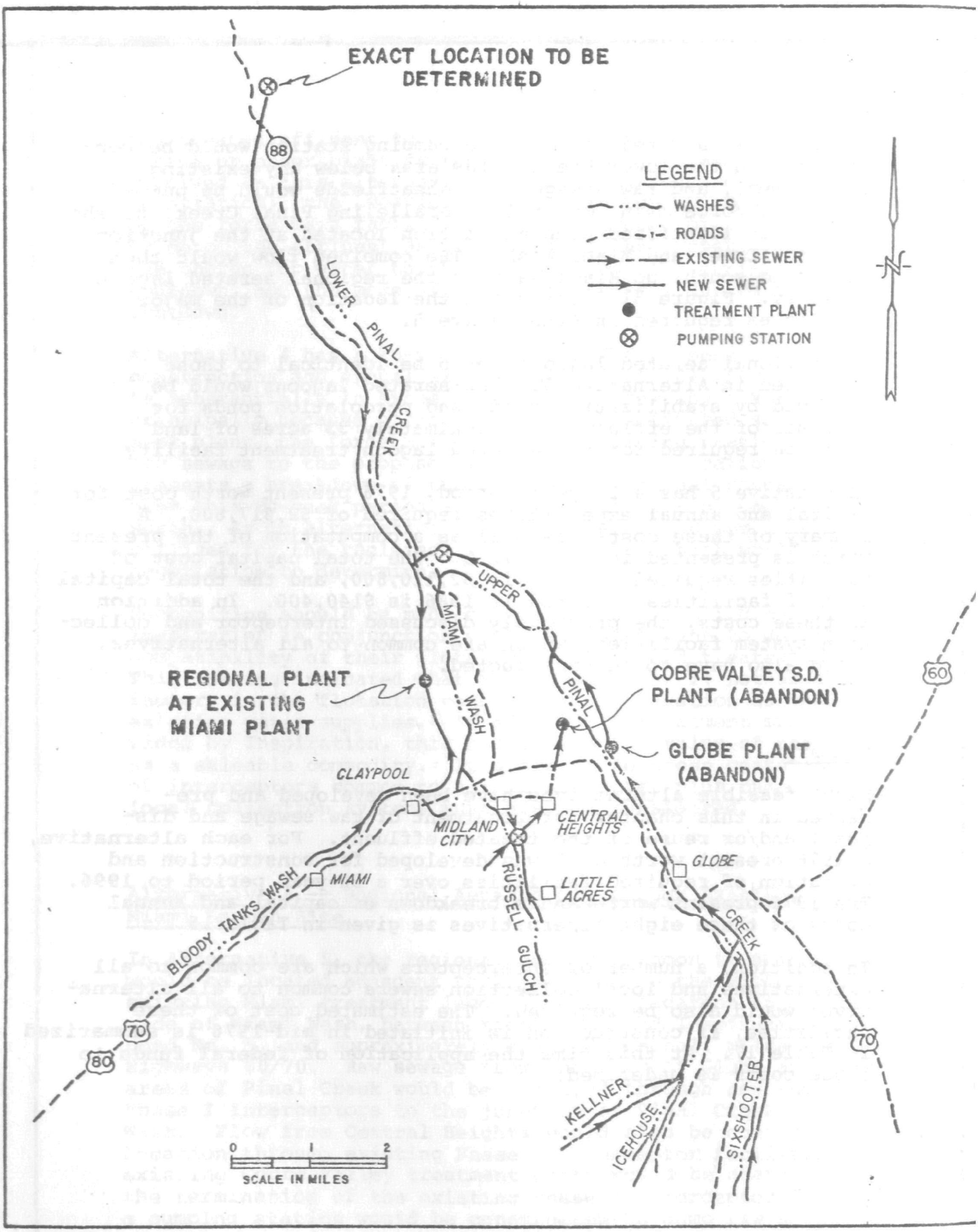


FIGURE 31

ALTERNATIVE 5 — REGIONAL AERATED LAGOONS. DISPOSAL TO PERCOLATION PONDS.

Table 16

GREATER GLOBE-MIAMI WASTEWATER PROJECT
20-Year COMPARISON OF LOCAL COSTS - 7% INFLATION RATE*
(thousands of dollars)

Alternative	Total Present Worth Cost	Present Worth of Capital Costs**	Local Share-Present Worth of Capital Costs	Local Annual O&M Costs	Present Worth Value of Effluent	Total Local Present Worth Cost For 20-Year Period
1A	6,968.7	3,722.4	930.6	4,175.9	1,041.6	4,064.9
1B	7,183.8	3,524.8	881.2	4,197.9	-	5,079.1
1C	6,494.8	3,237.5	809.4	3,664.4	-	4,473.8
2A	2,499.8	1,290.7	322.7	1,541.4	-	1,863.8
2B	3,136,4	1,562.0	390.5	1,828.9	-	2,219.4
3	3,465.2	1,807.4	451.9	1,248.5	-	1,700.4
4	8,847.8	4,542.1	1,135.5	5,636.5	1,041.6	5,730.4
5	2,817.6	1,365.0	341.3	1,696.9	-	2,038.2

* 7% annual cost increases for inflation, Interest rate = 7%.

** 75% grant fundable by EPA.

Table 17

ESTIMATED COSTS OF INTERCEPTORS
COMMON TO ALL ALTERNATIVES

Item	Projected Mid-1976 Cost
Interceptors common to all alternatives	$2,193,100
Local sewer improvement districts	
Lower Miami and Claypool	1,174,900
Russell Gulch	1,033,200
Miami Wash	392,200
Sixshooter Canyon	594,400
Icehouse Canyon	193,600
South Globe, Skyline, etc.	2,116,700
Central Heights	706,000
	$8,404,100

IV. ANALYSIS OF THE ENVIRONMENTAL IMPACTS OF THE VIABLE ALTERNATIVE SYSTEMS

Introduction

This section of the EIS identifies and discusses the significant environmental, social and economic impacts of the eight alternative plans for the treatment and disposal of Globe-Miami wastewater. Some impacts that may be conceived were not discussed because they were evaluated to be insignificant. The impacts discussed include not only the primary effects -- the immediate results of an action -- but also secondary effects -- the consequences of the direct effects. Emphasis is placed on the time frame of the impact (short term or long term), its nature, general magnitude and associated indirect effects. In some cases the analysis refrains from labeling effects as either beneficial or adverse, since these designations often depend on the value system of the person evaluating the impact. Measures which could mitigate (reduce in magnitude) or avoid the adverse aspects of an impact are also identified, where applicable, after the impact.

Impacts Common to All Alternative Plans

Wastewater treatment and disposal as required by the state and EPA has some effects that tend to be relatively independent of any particular alternative plan. That is, whatever variation occurs among alternatives is generally insignificant in relation to the total effect.

Short-Term Impacts

Short term in this case is generally defined as that period from the beginning of the plan to shortly after completion of construction. During this period the short-term impacts are those ordinary events associated with most construction and the impacts are usually of short duration and can be effectively mitigated. These impacts and common mitigation measures are given in Table 18. Because of the different locations involved, the place and time of these impacts will change, but none were evaluated to be significant to the community as a whole.

Table 18

SHORT-TERM CONSTRUCTION IMPACTS

The direct short-term impacts of this project are related to construction activities. These impacts are relatively minor in effect and magnitude and in most cases the impact can be effectively mitigated. The impacts considered, their mitigations, and our judgment of their relative positive or negative merit are given in the following matrix.

Short-Term Impacts	1A	1B	1C	2A	2B	3	4	5	Recommended Mitigation Measures
Disruption of traffic during construction of treatment plant and interceptors	A	A	A	A	A	A	A	A	• Reroute traffic around construction areas. • Provide flagmen in construction areas where traffic cannot be rerouted.
Creation of dust by disturbance of the soil mantle during construction work	A	A	A	A	A	A	A	A	• Keep soil wetted down in construction areas.
Increase in potential for soil erosion during construction	A	A	A	A	A	A	A	A	• Minimize removal of vegetation in construction areas. • Exposed slopes should be hydromulched and revegetated.
Effect of spoil disposal	A	A	A	A	A	A	A	A	• Locate spoil disposal sites in areas that would minimize aesthetic impact and damage vegetation. • Replant permanent spoil sites with native vegetation.
Spills of fuels and maintenance chemicals	A	A	A	A	A	A	A	A	• Perform all equipment maintenance in designated areas, keep all fuels and chemicals properly containerized, and require proper disposal of all waste products.
Increase in noise near construction sites	A	A	A	A	A	A	A	A	• Require all internal conbustion engines to have mufflers, baffles or other noise reduction devices. • Perform construction work during normal daylight, working hours.
Visual impact of construction equipment and construction site	A	A	A	A	A	A	A	A	• Maintain construction equipment in areas that would not create visual eyesores and minimize impact on vegetation. • Fence or otherwise screen construction maintenance areas.
Increase in emission of aerial pollutants by construction equipment	A	A	A	A	A	A	A	A	• Minimize the use of internal combustion engine-powered equipment where possible. • All internal conbustion engine equipment should be equipped with emission control devices.
Creation of attractive nuisance and safety hazards at construction site	A	A	A	A	A	A	A	A	• Maintain construction equipment in an enclosed corporation yard. • Keep curious "bystanders", especially children, away from construction areas; both during and after daily construction. • During pipeline trenching operations, leave no open trenches for longer than one working day.
Temporary increase in local and regional economic activity	B	B	B	B	B	B	B	B	• None
Temporary increase in employment	B	B	B	B	B	B	B	B	• None

LEGEND: A Adverse
B Beneficial

Long-Term Direct Impacts

Long-term direct impacts result from the construction, location and/or operation of the facilities and generally remain in force for the life of the project or longer. The time span may be 20 to 50 years or longer. These impacts tend to be on or near a facilities site or pipeline route or in the area of wastewater disposal. Some are generally common to all alternatives in that the magnitude of variation in degree of impact among alternatives is small. These impacts do not greatly influence the selection of a recommended plan from among the alternatives even though the impact may be significantly adverse. The following list indicates those impacts considered significant to the community and discussed in the subsequent text.

- *Impact on vegetation and wildlife*
- *Possible disturbance of archeological sites*
- *Possible effects of earthquakes*

- **The direct impact of treatment plant location on vegetation and wildlife.**

Sewage treatment facilities require land and the removal of native vegetation and wildlife. Depending on the alternatives, the amount of land required will vary from about 8-100 acres. Unless suitable, unoccupied habitat is found, most of those animals displaced from the site will perish. Although not quantified, this loss is expected to have a minor effect on the total animal population of the area.

Vegetation removed from the local soils requires very long periods of time to reestablish. Landscaping can be used to revegetate base land and make it amenable to native wildlife. The present plant sites at Globe and Miami are considered beneficial to extant fish and wildlife because they provide the source of a limiting resource -- water.

- **The location and construction of facilities may disturb or destroy artifacts of historical importance.**

An archeological reconnaissance of the listed potential plant sites did not reveal any evidence that archeological or historical sites would be involved. A cursory review of pipeline routing indicates a low potential for the encounter of artifacts. Once detailed routings and sites are selected and surveyed, a complete reconnaissance survey with subsurface testing for archeological sites should be undertaken.

Construction activities may uncover subsurface archeological sites not detectable by ground surface survey. Should any indications of buried archeological resources be encountered during facility or pipeline construction, all work in the immediate vicinity should be halted until the suspected find is evaluated and recommendations for further action made by a professional archeologist.

- Damage to facilities and disruption of operations due to earthquakes.

The treatment plant, pump stations, trunk sewer lines and other facilities are subject to being made inoperative by a major earthquake or aftershock. The rupture of lines and tanks could cause raw sewage to enter drainage channels. Based on the history of seismic activity in the area, the probability for a major earthquake (Mercalli magnitude VII or larger) is judged to be low. There are many small and several large faults in the Pinal Mountains and Globe Hills area; however, these have not recently been seismically active. An examination of geologic maps for the Globe-Miami area (Peterson, 1962) shows no fault lines under the proposed treatment plant sites and the proposed interceptor routes. A detailed geologic map which includes Alternative Site 3 was not available to assess its location in relationship to known faults.

Facilities should be designed to minimize physical damage which can occur during an earthquake. Natural drainage systems should be kept open to carry off raw sewage during a catastrophe.

Long-Term Secondary Impacts

Long-term secondary impacts are those that occur indirectly as the result of a proposed action. These secondary impacts may be significant, especially as they relate to future population change, economics and land use in the study area. Common secondary impacts of the proposed project are as follows.

- *Population growth*
- *Economic growth*
- *Increased size of government*
- *Increased cost of government*
- *Ability to pay*
- *Property values*
- *Land use*
- *Biological resource changes*
- *Aesthetics*
- *Resource consumption*
- *Air quality*

• Population growth inducement.

Growth in the Globe-Miami area is presently constrained by several factors: lack of a rapidly expanding employment base; lack of available land suitable for residential development; inability of the private housing market to construct (or obtain financing for) housing in the price ranges for which a housing demand exists; and lack of utility facilities in various areas (water, sewer, natural gas).

All alternative projects provide for a wastewater treatment capacity of 2.4 mgd at one or more publicly owned facilities. The rated capacity of the three existing public facilities (Globe, Miami and Cobre Valley Sanitary District) totals 0.55 mgd; wastewater flows currently treated at these facilities total 1.05 mgd. Thus, all alternatives provide 1.35 mgd of treatment capacity above that needed to service the existing sewered population in the Globe-Miami area. This excess capacity could be utilized to service existing unsewered residents or to support future population growth in the Globe-Miami area.

Successful implementation of one of the alternative projects would eliminate the sewer connection bans in Miami and Globe. While such a situation might normally be expected to induce a significant amount of new development, this seems unlikely to occur in the Globe-Miami area. The existence of several other constraining factors (mentioned above) will minimize the extent of direct growth inducement attributable to the project.

The major role of any of the alternatives will be to accommodate longer term future development in the Globe-Miami area. The rate of this future growth will be determined more by general economic conditions and availability of land and financing for new housing than by the existence of wastewater treatment capacity at new or expanded public facilities. The placement of new interceptor lines may largely determine the location of future development; but existing constraints of topography will also play a major role in this regard.

• Socio-economic impacts of growth.

Any development induced or accommodated by the project will result in increased local economic activity and assessed valuation and a consequent increase in the tax base for Gila County, the Town of Miami and the City of Globe. This development will also be accompanied by increasing demands for a variety of public services and facilities. Transportation, utility, educational, medical, governmental and recreational facilities may require expansion to service the increased population.

- Failure to secure an administrative organization to provide a regional sewerage system.

Presently there is no legal entity capable of operating, maintaining and funding a regional sewage treatment plant and common interceptor lines. Initial efforts were made by the City of Globe, Town of Miami, Gila County and the Cobre Valley Sanitary District to enter into an intergovernmental agreement to participate in the project; however, the Town of Miami and Gila County have withdrawn from participation in the project (see INTRODUCTION section of the report).

Failure to form either a regional sanitation agency covering the entire service area or a joint powers agreement assigning responsibility and cost on the basis of use of the treatment facility, prevents immediate implementation of any alternative involving regionalization.

John Carollo Engineers (1971) recommended three alternative methods of organization:

1. The existing Cobre Valley Sanitary District could be expanded to include all the unincorporated area to be served.

2. A new county sanitary district could be formed to encompass the area.

3. The City of Globe or the Town of Miami could annex the entire unincorporated area to be served.

Combinations of these methods may prove feasible also.

- Costs of government and services.

Whichever alternative is selected, local jurisdictions must allocate the local share of capital costs to their constituents, who also must pay for the operating costs of the system. It is possible that, for some households with on-site disposal, the costs of participating in a centralized system may actually be less than costs they are now paying, as on-site systems may be unreliable and subject to frequent servicing.

- Ability to pay.

As with any major public capital investment, the capacity of the local resource base to bear the local share of the cost is a critical consideration. An estimate of the cost of the project to the average resident must await the development of a financing plan and the specification of administrative arrangements for project implementation and financing. Major issues to be considered include the determination of how areas not presently located within existing municipalities or service districts are to be brought into the financing of the project (if at all), the principle on which capital costs are to be allocated (such as per dwelling unit equivalent, per benefitted acre, or some other principle) and the actual financing mechanism (short-term assessment or long-term debt). All of these decisions, as well as the alternative selection itself, will affect the magnitude and distribution of costs.

A configuration of unique local circumstances makes these decisions more important than they might be in other locations. The Globe-Miami area is characterized by comparatively low incomes, higher than average median age, and relatively low residential property values. These are all indicators of possible difficulties in supporting major public capital investment. Where severe restrictions on the taxing powers of public agencies exist, these problems may be aggravated. Each of these circumstances is discussed below.

Income. The Globe-Miami area is characterized by lower average and median incomes than the State of Arizona or the U. S. as a whole. Table 19 presents 1969 income from all sources for families in the U. S., Arizona, Gila County, Globe and Miami. While incomes have risen since 1969 due to inflationary pressures, there is no reason to believe that the difference in local versus state and national income levels has altered.

More importantly, area incomes are significantly lower than state and national income levels, and this is a factor which must be taken into consideration in devising a wastewater facilities financing scheme appropriate to the Globe-Miami area.

It should also be pointed out that the median age of the population is higher than that of the state: 26.3 years for Arizona and 27.5 years for Gila County (1970 Census). This suggests that the study area has a greater proportion of older and possibly retired persons than the state; as retired persons typically live on incomes which do not keep pace with inflation, this factor too must be considered.

Property Values. Values of residential properties, as well as incomes, are markedly lower in the study area than in other parts of the state and nation. This comparison is presented in Table 20.

While housing values for Arizona as a whole lag only slightly behind the national average, values in the Globe-Miami area are barely half the national average (Gila County average = 53 percent of U. S. average).

Table 19

Family Incomes in 1969 of Globe & Miami as Compared to County, State & Nation

	Family Income[1]	
	Mean (Average) Family Income	Median[2] Family Income
U. S.	$10,999	$ 9,590
Arizona	10,501	9,187
Gila County	8,633	7,886
Globe	9,256	8,558
Miami	8,264	7,687

[1]For unrelated individuals (persons not living in a family setting) the distribution of incomes is comparable.

[2]Median: that level which divides the upper 50% from the lower 50%.

Source: U.S. Census of Population, General Social & Economic Characteristics, U.S. Summary, 1970 (Tables 178 and 180) and Arizona, 1970 (Tables 118 and 124).

Table 20

Housing Values in Globe-Miami Area Compared to County, State & Nation

	Median Value of Owner-Occupied Units*
U. S.	$17,000
Arizona	16,300
Gila County	9,000
Globe	11,300
Miami	6,600
Claypool	7,000
Central Heights	9,600

*For one family homes on less than 10 acres with no business on property.

Source: U.S. Census of Housing, General Housing Characteristics, U.S. Summary, 1970 (Table 5) and Arizona, 1970 (Tables 23, 24, 27, 60 and 61).

There are many reasons for this difference. Average lot sizes are probably considerably smaller in the Globe-Miami area than is the case elsewhere. For example, in the Midland City area, lot sizes are typically under 2,500 square feet; in Central Heights, typical lot sizes range between 3,000 and 5,000 square feet. Smaller lots are not uncommon.

It also appears likely that average structures are smaller. For a sample of 10 percent of dwelling units in Midland City and Central Heights, excluding mobile homes, square footage per house averaged about 900. The median age of owner-occupied housing units in the U. S. is about 25 years (i.e., 50 percent of owner-occupied units have been built since 1950). In the Globe-Miami area, the median age is certainly higher than that if mobile homes are excluded. Finally, as mobile homes are included in the housing value estimates, it should be pointed out that, at present, this type of unit accounts for about 5 percent of the total year-round housing stock in the U. S. In Gila County, mobile homes accounted for about 11 percent of the year-round housing stock in 1970 (HUD News, August 1975; Census, 1970).

All of these factors would work to keep housing values low, resulting in lower per-housing-unit assessed valuation than would be the case in other areas and limiting the amount of revenue that can be raised from property taxation.

Institutional Arrangements. A number of practical obstacles exist to the development of a comprehensive and equitable financing scheme. First, portions of the area which might benefit from a regional or subregional wastewater treatment system lie outside established boundaries of cities and service districts. While service can nevertheless be provided to these areas, there appears to exist, at present, no administrative mechanism to implement a cost allocation scheme. Second, even where a sanitary district does exist, 20 percent of the voters in that district can block a district taxation proposal.

Finally, there must be agreement among the parties cooperating in project development on a fair method of cost allocation. Among questions to be addressed would be whether cost should be borne directly by users on a housing-unit-equivalency basis, on the basis of projected use per se, on the basis of acreage, on the basis of assessed valuation, or some other basis. Alternatively, cost could be divided among participating jurisdictions on the basis of the proportion of capacity they constitute or on some other basis. This environmental impact statement makes no recommendation as to the appropriate approach for area communities to take. However, it does appear that these issues would have to be resolved to local residents' satisfaction before a project could be implemented. Whatever approach is adopted, property values and incomes in the region are such that long-term financing of the local share appears to be necessary.

- Effect on property values.

A wastewater treatment facilities system can affect property values positively or adversely. An adverse impact on property value may be experienced in the area adjacent to the treatment plant. Other things being equal, a property affected by odors emanating from a plant, within line of site of a plant, or even on the same road as a plant, will normally have a lower value than a property free of these attributes. Value discrepancies due to treatment plant location can be reduced substantially by careful attention to plant siting selection of treatment process, attentive plant management, and other measures. Where the supply of developable land is ample in proportion to the demand, even a slight adverse effect of a sewer plant may be sufficient to render adjacent properties undesirable for certain types of development. Where land for development is in short supply, as is the case in the Globe-Miami area, dramatic impacts on property values near a treatment plant are less likely to be experienced, particularly if the plant is attractively designed and landscaped, properly buffered and operationally acceptable (i.e., dust, odors, vehicular traffic and other effects are minimized).

Alternatives 1C, 2A and 5 have the potential for increasing the extent of rising groundwater on portions of the Bixby Ranch, and thus could adversely affect property values in this area.

In areas at the fringe of metropolitan centers in the U. S., it is often the case that the extension of sewer service to areas not previously served has occasioned increases in property values. Whether this would be the case in the Globe-Miami area, and if so, the extent of such increases, is uncertain. On the one hand, the provision of reliable sewage removal and treatment will be an overall asset to properties not now served. Housing units now operating with on-site systems would experience an increase in value when sewerage is extended to them. Vacant land which presently is not served by public sewers would appreciate in value until it attained the same value as that of comparable land which does have sewerage service. On the other hand, if the total acreage brought into the sewerage service area is large enough, the increase per se in the amount of developable land will be a factor in keeping values down, as landowners and developers will compete to find buyers. Both of these effects -- trends toward appreciation and reduction in land values -- are likely, but it is not known how they will balance one another.

- Land use changes.

It appears unlikely that the present mix of development would be affected by any of the alternatives, or by the no project alternative. Land use in the area is unlikely to alter substantially even in the long run, and existing conditions in terms of types of uses will persist through the foreseeable future. The impacts of those uses on the environment will be substantially determined by local administration of planning and environmental regulation. Because regulation and enforcement policies are subject to change with changing public attitudes and governmental administrations, the appropriate rating for all alternatives is problematical. A mitigation measure to ensure orderly growth in areas not now zoned would be the implementation and conscientious enforcement of zoning.

- Biological resource changes.

Most secondary effects on biological resources relate to changes in land use and resource consumption. Increases in population growth cause conversions of land use. Open space and agricultural lands are converted to use for houses, business and industry. Vegetation and wildlife habitat is usually lost with these conversions in land use. Biological resources are also affected by changes in water quality.

Increases in hunting and fishing with population growth can also affect game animals and game fish populations. Because private lands represent a minute percentage of the total area and no endangered species are known to be involved, the conversion of habitat is probably not significant to the region.

- Aesthetic and visual changes.

Most aesthetic changes will be associated with land use. The conversion of open space to homes, business and industrial uses could be considered aesthetically displeasing. Increases in roadways, traffic and noise are often side effects of growth that also distract from the aesthetic value of scenery. The type of impact is relative to one's viewpoint and therefore problematical.

- Resources and energy consumption.

Increases in use of both renewable and non-renewable resources would be expected to occur with population growth in the study area. Its impact is of local and regional consequence.

Demand for renewable resources such as water, lumber, food, wildlife, etc., and non-renewable resources such as gasoline, natural gas, and minerals, will probably increase proportional to population growth. The extraction, harvesting and processing of these resources produces a variety of both beneficial and adverse environmental effects. Often, maximizing the production of renewable and nonrenewable resources, to better support continued growth, entails social and environmental costs such as reduced aesthetic, recreational and wildlife values, increased water and air pollution, and preemption of alternative land or resource uses. Since nearly all renewable and non-renewable resources used in the Globe-Miami area are acquired from other areas, impacts related to acquisition, production and processing of the resources will occur elsewhere.

Air Quality. Air emissions from mobile sources (automobiles, trucks, etc.) and stationary sources (factories, homes, businesses) will probably increase in direct proportion to population growth. The largest single stationary air pollution source, the Inspiration Consolidated Copper Company smelter, is presently on a successful air pollution control plan. Air pollution control devices reduce particulate emission by 99 percent and sulfur dioxide emission by 95 percent. Future air quality problems relating to the Inspiration Consolidated Copper Company smelter should be minimal if the compliance plan remains in effect.

Compared to stationary sources, mobile sources contribute rather small amounts of particulates and sulfur oxides, but are a major source of hydrocarbons, carbon monoxide, and nitrogen oxides. Mobile source emissions do not pose a significant air quality problem in the Globe-Miami area, and EPA motor vehicle emission regulations should prevent such problems from developing in this area.

Impacts that Vary Among the Alternatives

Many of the project impacts relate to some alternatives but not others and the level of significance may vary among affected alternatives. These project specific impacts are listed in Table 21 showing their applicability to individual alternatives. Discussions of their effects follow.

Table 21

LONG TERM IMPACTS SPECIFIC TO ALTERNATIVES

This list of direct and secondary impacts shows our judgment of the relative positive and negative merits of the impacts.

Impacts	0	1A	1B	1C	2A	2B	3	4	5
BIOLOGICAL RESOURCES									
Discharge of treated effluent to Pinal Creek can affect vegetation, wildlife and possibly fish.	P			P					
The effect of ponding water on vegetation and wildlife	A				P	P	P		P
The disposal of treated effluent by spraying on upland habitats and its effect on vegetation and wildlife			P			P			
GEOLOGY AND SOILS									
Effect of spray disposal of effluent on soil stability of adjacent land			P			P			
WATER RESOURCES									
Effect of an effluent surface discharge on Pinal Creek quality	A			P					
Effect of an effluent surface discharge on Pinal Creek quantity	A			A					
Effect on groundwater quality by effluent percolation	P				P		P		P
Effect on groundwater quantity by effluent percolation	A				A		A		A
Effect of disposal method on reuse	B	B	P	B	B	P	B	B	B
Flood hazard associated with location and operation of treatment plant	A				A				A
Opportunity for reuse of treated effluent by copper companies and effect on their industrial water demand	P	B	A	P	P	A	P	B	P
Reuse of treated effluent for agriculture	B			P	P		P		P
SOCIAL IMPACTS (DIRECT)									
Increase in noise levels because of treatment plant operation		A	A	A	P	P	A	P	P
Production of obnoxious odors from sewage treatment plant operation	A	P	P	P	P	P	P	P	P
Impact of sludge disposal		P	P	P				P	
Impact of septic tank service disposal	A	P	P	P	P	P	P	P	P
Increase in consumptive use of electrical energy by treatment plant		P	P	P	P	P	P	P	P
Increase in personnel needs to operate treatment plant		A	A	A	B	B	B	A	B
PUBLIC HEALTH									
Potential nuisance mosquito and other insect problems resulting from discharge of effluent to Pinal Creek and land disposal of effluent	A	P	P	P	A	P	A	P	A
Health hazard of contact with sprayed effluent			A			A			
Potential discharge of septic and unsanitary wastes should an employee strike, a major equipment malfunction, or other unforeseen events occur		A	A	A		A		A	A
Operational reliability and protection of environment		P	P	P	P	P	P	P	P
Biological and mineral contamination of domestic wells	P		P	P	P	P			P
AESTHETICS									
The visual impacts of treatment plant and other sewage facilities	A	A	A	A	A	A	A	P	A
FINANCIAL									
Effect of treatment plant cost		A	A	A	B	B	B	A	B
Effect of treatment plant location on property values		A	A	A	N	N	P	N	P
Effect of treated effluent spray disposal on value of U. S. Forest Service exchange land			A			A			
Use of existing Phase I interceptor facilities	A				A	A			
Utilization of existing Cities Service plant		A	A	A			A	A	A
LAND USE									
Effect of treatment plant on adjacent zoning		A	A	A	N	N	N	N	
Compatibility with land use planning		A	A	A	B	B	A	B	
IMPACTS OF NO ACTION									
Retention of existing inadequate waste treatment facilities	A								

LEGEND:
- A Adverse
- B Beneficial
- P Impact of unknown value
- N No discernible impact
- Blank Not applicable

Biological Resources

- The direct discharge of treated effluent to Pinal Creek can affect vegetation, wildlife and possibly fish.

Alternative 1C discharges treated effluent directly to Pinal Creek just below the confluence of Miami Wash and Pinal Creek. This discharge would result in surface flow of about 5 cfs for an undetermined distance downstream. It is assumed that the flow would percolate into the alluvium during the dry season. This flow would probably encourage an abundant growth of annual grasses, herbaceous plants (reeds and cattails), and riparian shrubs and trees. The additional vegetation plus the surface water source would attract birds and mammals, especially quail and dove, rabbits, squirrels and deer. Non-game fishes could probably be established. Reptiles and amphibians that feed on the other life would also be productive. Ponded water and moist vegetation could encourage the seasonal production of mosquitoes and other nuisance insects. Chlorination of the effluent would cause it to be toxic and lethal to aquatic animals near the point of discharge.

- The effect of ponding wastewater on vegetation and wildlife.

Alternatives 2 and 3 use ponds for effluent treatment and disposal. Aerated lagoons or ponds are designed to retain the wastewater during the oxidation treatment process. Percolation ponds hold the treated water during the time it is disposed of by evaporation and percolation into the groundwater. If properly designed and maintained, there is no surface discharge from such ponds. Grasses, tules and cattails tend to grow around the perimeter of the ponds enhancing their value for wildlife. Under normal maintenance procedures, however, this vegetation is inhibited or removed. By raising the level of groundwater immediately around the pond, the growth of riparian-type trees, such as cottonwood, sycamore and willow, can be encouraged.

Wildlife may use the percolation ponds for drinking waters; however, large animals may be restricted from the pond areas by fencing. The water could provide habitat for ducks, other birds, small mammals, etc. If stocked, warmwater fish often inhabit such ponds.

Mosquitoes and other nuisance insects can breed in the ponds. Certain fish and invertebrates (i.e., mosquito fish, dragon flies, and parasitic nematodes) could be introduced to assist in the control of nuisance insects. Insects can also be controlled by chemical treatment.

- The disposal of effluent by spraying on upland habitats and its effect on vegetation and wildlife.

Alternatives 1B and 2B spray treated effluent on upland vegetation (i.e., mesquite, cat claw, palo verde). A few native plant species receiving marginal amounts of effluent spray may become more luxuriant, green and productive, but the plants present are desert types and would certainly die with continuous watering. Annual grasses and herbaceous plants that require rain for germination and moist soil for growth and maturity would, over a period of time, populate the wetted area. No field research has been performed to estimate which local plants would fill this new habitat. Generally the present plant cover of xerophytic shrubs and trees would convert to grassland. To dispose of treated effluent in this manner would convert about 10 acres. The difference in treatment processes, activated sludge vs. aerated lagoons, would probably not alter the impacts.

Wildlife would be affected by changes in vegetation species and biomass and also respond directly to the spraying operation. Certain wildlife species using the disposal area would be displaced because of the constant moisture and altered vegetation. No research has been done to determine either the species which would be displaced or those which may remain to use the area at least occasionally. Because of the change in vegetation, microclimate and food supply, animal species not now common to the area would establish at least seasonal residence. The potential animal community for the wetted area is presently undefined.

The change in vegetation on the spray disposal area would increase the productivity of grasses and forbs and thus the grazing value of the land to cattle ranchers. In recognition of the inevitable change in vegetation, the spray disposal area could be cleared of trees and brush and cultivated to produce desirable pasture vegetation.

Geology and Soils

- Effect of spray disposal of effluent on soil stability of adjacent land.

Spray disposal of effluent upon land is normally undertaken at a relatively low average application rate of approximately 0.3 of an inch per hour. The application rate is normally somewhat greater than this, as the soil is often allowed to rest and rejuvenate after being used for a day or so. Stability of adjacent land would be affected primarily by surface runoff from the spray disposal area. Assuming that 0.3 of an inch per hour is a satisfactory application rate, it would not be expected that there would be an adverse impact from spray disposal upon soil stability. Alternatives 1B and 2B are rated with the problematical impact upon land stability due to the spray disposal operations.

Effluent is removed from the spray zone by evaporation, transpiration and percolation. The exact spray locations and method of applying the wastewater are not yet defined. The main soil type covering the prospective area of effluent disposal are the White House-Caralampi-Hathaway association. In general, the soils are deep and have moderate to slow permeability. Slopes in the area are greater than 5 percent. Application of wastewater if not managed properly could cause the soils to become saturated and result in surface runoff to Pinal Creek, especially after a rainstorm. Surface runoff could cause accelerated erosion resulting in gullies. Saturated or heavily wetted soils might be subject to soil creep or slumping.

The selection of location, method of application and operational safeguards can eliminate excessive surface runoff and prevent adverse impacts.

Water Resources

- Effect of an effluent surface discharge on flows in Pinal Creek.

Any discharge to the surface of Pinal Creek would definitely increase the quantity of water available, either as surface flow or shortly thereafter as subsurface flow in the creek. Whether or not an increase in the amount of water in Pinal Creek is beneficial or adverse depends upon the party expressing an opinion. For example, the Inspiration Consolidated Company would more than likely feel it to be beneficial (as long as the discharge occurred far enough upstream) since it would result in a greater quantity of water reaching their Pringle Pumping Station. Oppositely, property owners such as Mr. Bixby and others whose property becomes "boggy" during some high stream flow conditions, would consider an increase in the quantity of Pinal Creek flow to be an adverse impact. Since there are alternative methods available for the copper companies to obtain the reclaimed water, the overall impact of Alternatives 0 and 1C is considered adverse.

- Effect of a surface discharge on water quality in Pinal Creek.

Discharge of effluent directly to Pinal Creek can affect the quality in two ways: the mineral and biological quality. The Present Environment section of this statement generally describes the mineral quality of Pinal Creek in the vicinity of the Pringle Pump Station where the TDS, for example, averaged over 3,000 mg/l. The mineral quality of the treated effluent would be around 700 mg/l, and thus direct discharge to the creek would tend to enhance the overall mineral quality of Pinal Creek. As previously noted, Inspiration Consolidated Copper Company has some concerns regarding specific chemical constituents in the wastewater.

The impact on biological quality would vary throughout the year, depending on whether the creek is about dry or carrying runoff water. During a dry period, Alternative 0 definitely has an adverse impact upon public health aspects of biological quality because the effluent is poorly treated and unchlorinated. Alternative 1C on the other hand, would have a problematical impact on quality because the effluent would be a relatively high quality activated sludge effluent and chlorinated. A high chlorine content would cause the effluent to be toxic to some aquatic organisms. Assuming proper operation of the chlorination system, it would kill essentially all bacteria and most of the viruses in the effluent. During high creek flow conditions, the impact upon mineral and bacteriological quality would depend primarily on the characteristics of the storm flow. Storm runoff from urban and undeveloped land often has a relatively poor mineral and bacteriological quality due to the pick-up of polluting constituents. Mineral contribution from the mine company land is high. It is not expected that a surface discharge to Pinal Creek would have any significant impact upon water quality during a wet weather condition.

- Effect on groundwater quality by effluent percolation.

As discussed in the PRESENT ENVIRONMENT section, groundwater quality in Pinal Creek and Miami Wash is presently in a very poor condition due to historical operations by the copper companies. With regard to mineral quality, any alternative using percolation as a disposal method would have a beneficial impact upon groundwater mineral quality. There is conjecture, however, that percolation would have a detrimental impact upon bacteriological quality of the groundwater basin. The effluent would be chlorinated prior to discharge into the percolation ponds. In addition, the movement of percolated effluent through soil should remove most remaining bacteria and virus through the combined processes of physical straining, adsorption upon soil particles, and detention time. It is possible, however, for biological organisms to remain in the percolated effluent for an extended time and distance from the point of percolation. The degree of removal depends upon the type of soil and other technical factors which are unknown in this case. The effect upon groundwater bacteriological quality is therefore rated problematical for Alternatives 0, 2A, 3 and 5. Of these, Alternative 3 would probably have the least effect impact upon humans because the treatment plant and percolation ponds are located downstream of any existing domestic water supply wells.

- Effect on groundwater quantity by effluent percolation.

Any of the alternatives which utilize percolation ponds for effluent disposal will add to the amount of water available in the groundwater basin, and thus have a beneficial impact. The impacts associated with increased groundwater quantity were discussed previously. Alternatives 0, 2A, 3 and 5 could have an adverse impact.

- Effect of disposal method upon water available for reuse.

Except for the spray disposal alternatives, the effluent stays within the Pinal Creek watershed for direct or indirect reuse. The spray disposal Alternatives 1B and 2B would have a problematical impact upon water availability within the basin because it is unknown about how much effluent would enter the groundwater. All other alternatives would have a beneficial impact upon water availability within the basin, especially those alternatives with direct reuse features. Alternatives that utilize percolation ponds or direct discharge to the creek would add to the quantity of groundwater available for reuse through wells.

- Opportunity for reuse of treated effluent by copper companies and effect on their industrial water demand.

Alternatives 1A and 4 would use reclaimed water directly in copper processing. An indirect reuse, on the other hand, could occur in Alternatives 1C, 2A, 3 and 5 by withdrawals from the groundwater. This withdrawal would occur through existing copper company wells. Water is not generally available for reuse in Alternatives 1B and 2B, in which the effluent would be sprayed on land.

- Reuse of treated effluent for agriculture.

The only alternative which would directly reuse effluent for agricultural purposes is Alternative 0 -- the no action alternative. This would occur at the existing farming operation which is immediately below the Globe lagoons. A possible reuse would occur for Alternatives 1C, 2A, 3 and 5 as these are alternatives in which effluent could reach the groundwater basin via percolation ponds or direct discharge and subsequent percolation, and would be available for agricultural reuse downstream of the point of discharge. At the present time, there is a limited amount of agriculture downstream in the lower Wheatfields area, but should such agricultural operations develop in the future, these alternatives would have an impact upon the quantity of water available. The golf course is presently irrigated by Inspiration Consolidated Copper Company which could divert wastewater for this purpose as wastewater becomes a component in their water supply.

- Flood hazard associated with location and operation of treatment plant.

In the ALTERNATIVES section of this statement, an analysis was presented of the effect of a 100-year flood upon the four treatment plant sites located adjacent to Pinal Creek and/or Miami Wash. All of these sites are above the 100-year flood level or could be protected from a 100-year flood (in come cases at substantial cost). Additional evaluation of flood hazard problems at Site 2 is presented in Chapter V of this EIS.

Social

- Increase in noise levels near proposed wastewater treatment plant.

Pumps, generators and other equipment at the treatment plant will produce noise levels of approximately 70-80 dBA periodically throughout the day and night. These noise levels could be distracting to residents located near the proposed treatment plant sites. It is assumed that residents up to 1/2 mile from the plant may hear noise under certain climatological situations. Homes are located near Alternative Sites 1 and 3; the other sites are not located near any residences or businesses.

Pump stations will be located along the interceptor route where gravity flow is not available. These pumps could be located in residential areas and be a source of noise. The relative magnitude and importance of such impacts can only be determined during the site selection process.

Pumps and other equipment should be housed in insulated buildings or be installed with mufflers and baffles to reduce noise levels in areas where they may be annoying to local residents.

- Production of obnoxious odors from sewage treatment plant operation.

The proper engineering design and operation of a sewage treatment plant controls the production and release of obnoxious odors to levels not detectable of the treatment plant property. There may, however, be extraneous circumstances which could lead to the production of odors, such as a power outage of more than several hours duration at the treatment plant. Such an outage would result in the creation of anaerobic conditions and the release of obnoxious odors. It should be noted that aerated lagoons could last through a substantially longer power outage without odor production than activated sludge facilities. All alternatives, with the exception of Alternarive 0, therefore, have a problematical impact upon the production of such odors. In Alternative 0, the ponds are operated in an aerobic/anaerobic fashion with little or no control over the release of odors. Alternative 0, therefore, has an adverse impact relative to odor production.

- Impact of sludge disposal from treatment plant.

Between the two types of treatment plants considered, the activated sludge treatment plant produces substantial amounts of dried, digested sludge. This sludge may be beneficially used as a soil conditioner or as an alternative, it will be disposed of in the local sanitary landfill. The aerated lagoon treatment system does not produce sludge which must be removed from the system more often than once every 10 to 20 years; therefore, sludge disposal is not a factor. All of the alternatives using activated sludge treatment (1A, 1B, 1C and 4) would produce an impact resulting from sludge disposal because capacity would be required in a sanitary landfill.

- Impact of septic tank pumping disposal on treatment plant operation.

The discharge of septic tank pumpings to a sewage treatment plant can cause two problems. The first of these is a shock to the biological system due to an immediate heavy loading of solid organic material. The second of these is the cost of operating the sewage treatment plant to accommodate this heavy loading of organic material. In the engineering design of the treatment plant, a closed storage facility should be included to accept trucked septic tank wastes. The storage facility acts as a balancing reservoir, allowing the gradual and continual discharge of septic tank wastes to the sewage treatment plant which minimizes the impact of shock loading. All alternatives with the exception of the no action alternative can be designed to accommodate the discharge of septic tank wastes to the treatment plant. Alternative 0 presently has an adverse impact as there is no opportunity for controlled discharge of the septic tank effluents to the existing lagoons. The activated sludge process is most susceptible to shock loading because it operates using a relatively short aeration detention time in the neighborhood of 6 hours. The aerated lagoon treatment provides a detention time of about 5 days, and therefore is less prone to "upset" resulting from septic tank wastes.

- Impact of consumptive use of electrical energy by treatment and pumping facilities.

With the exception of Alternative 0, all other alternatives have an increased impact upon energy consumption. Alternative 0 however, is not considered a viable alternative. The degree to which the remaining eight alternatives consume energy is presented in Table 22 divided according to the treatment energy and pumping energy. It can be seen from this table that Alternatives 1C and 3 consume the least energy. Alternative 4 consumes over twice as much energy as other alternatives and is the most energy consuming of the eight viable alternatives. With the exception of Alternative 4, all of the eight viable alternatives consume roughly equivalent amounts of energy.

- Increase in personnel needs to operate treatment facilities.

Between the two treatment processes considered, it can be stated that the 3 mgd activated sludge process would require approximately 10 operators and the aerated lagoon treatment would require three. Alternative 0, the no action alternative, is assigned no impact as no personnel are presently utilized on a full-time basis for maintenance of these facilities.

Table 22

ENERGY REQUIREMENTS

Kilowatt - hours/20 years

ALTERNATIVE	TREATMENT	PUMPING	TOTAL
1-A	16,973,000	9,143,000	26,116,000
1-B	16,973,000	7,780,000	24,753,000
1-C	16,973,000	731,500	17,704,500
2-A	19,929,500	837,500	20,767,000
2-B	19,929,500	8,526,000	28,455,500
3	20,279,000	0	20,279,000
4	16,973,000	40,344,500	57,317,500
5	20,179,000	4,876,000	25,155,000

Source: Estimates provided by Don Owen and Associates, pers. comm.

Public Health

- Potential nuisance mosquito production from percolation ponds, direct effluent discharge and spray disposal.

Mosquito and nuisance insects can breed in the percolation ponds, and small pools formed by direct discharge of effluent or spray disposal. Mosquitos are a nuisance and certain species can transmit debilitating diseases. Percolation ponds are productive breeding places for mosquitos because of the high organic and nutrient content.

Fish, such as the mosquito fish (Gambusia affinis), could be stocked in the percolation ponds to reduce mosquito production. Chemical control of mosquitos is effective under some circumstances.

- Health hazards associated with direct contact of spray effluent.

Alternatives 1B and 2B involve the disposal of the treated effluent over land by spray disposal. After treatment, the effluent will be chlorinated before it is sprayed over land. Chlorination is very effective in killing bacteria and other pathogens; however, its effectiveness in killing virus and parasites is not completely known. Therefore, a potential health hazard exists to persons who are exposed to sprayed effluent. Disposal of the spray could be a problem on windy days.

A chlorine residual of at least 1.0 mg/l should be maintained in the effluent entering the pipeline for spray disposal.

Spray disposal areas should be clearly marked with a buffer zone to preclude human entry into the area during periods of spray disposal.

- Potential discharge of septic and unsanitary wastes should an employee strike, a major equipment malfunction or other unforeseen events occur.

In general, the more sophisticated the treatment process and/or the larger degree the system depends on pumping, the greater the possibility of an adverse impact due to a major equipment malfunction or an employee strike. All pump stations should be designed with standby pumping capabilities in the event of the failure of any of the installed pumping capacity. Thus, a major malfunction of pumping equipment would not put a pumping station out of operation completely. It can be stated that alternatives which rely to a minimum degree on pumping, and/or utilize aerated lagoons, would be impacted minimally by an employee strike. Thus, Alternatives 0, 2A and 3 would have essentially no impact due to an employee strike or equipment malfunction. Alternatives which rely on a more sophisticated treatment process and/or significant pumping, would be adversely impacted by an employee strike.

- Operational reliability of treatment facilities and protection of the environment.

With the exception of the no action alternative, all of the eight viable alternatives have sufficient operational reliability to meet the existing and anticipated waste discharge requirements. Any alternative which uses an activated sludge form of treatment should, however, be recognized as an alternative which is more "finely tuned" and thus requires more operational attention. An aerated lagoon is somewhat less susceptible to upset because of few mechanical operations and a longer detention time. Alternatives utilizing either activated sludge or aerated lagoon are considered essentially equal in their protection of the environment if operated properly.

- Biological and mineral contamination of domestic wells resulting from effluent disposal.

Alternatives 0, 1B, 1C, 2A, 2B and 5 all would have a problematical impact upon domestic well water quality as a result of effluent discharge. In all of these alternatives, effluent would be discharged upstream of some domestic wells. The effect on the mineral quality of domestic wells could in all likelihood be beneficial because the mineral quality of the treatment plant effluent(s) is anticipated to be substantially better than the groundwater presently available in Pinal Creek.

With regard to biological contamination of the groundwater supplies, no definitive statement can be made at this time. Throughout the United States, there have been historical activities where effluent has been percolated to the groundwater basin and subsequently reused, and there are many projects underway to further evaluate these concepts and effect upon bacteriological quality of groundwater. Results which are available at the present time are inconclusive at the best. Therefore, it would have to be stated that biological contamination of downstream domestic wells is a possibility, and the impact would be adverse. The farther the domestic wells are from the source of percolation of the effluent, the less is the likelihood of biological contamination. It cannot be conclusively evaluated until a project alternative is implemented and monitoring wells are constructed and operated to determine whether biological contamination occurs. It should be noted, however, that existing facility discharges and faulty septic tank systems present a public health hazard of at least equal magnitude. Implementation of a regional treatment system could produce a net reduction in bacteriological contamination of groundwater supplies.

Aesthetics

- The visual impact of the treatment plant and other sewage facilities.

The treatment plant and related facilities could aesthetically degrade areas adjacent to their location. Alternatives 1A, 1B and 1C, which have the regional plant located near the confluence of Miami Wash and Pinal Creek, are located near Highway 88 and several residences. Residents near this proposed site have objected to the site because of its negative aesthetic qualities. The present Globe treatment plant could become more visible from Highway 60 just north of Globe if the site is expanded as proposed in Alternative 2. The Miami treatment plant site (Alternative 2) is located away from residences and Alternative Site 3 is located in lower Pinal Creek away from frequently traveled roads. One residence is located about 1/2 mile and across the road from Alternative Site 3. The treatment plant site for Alternative 4 would be located somewhere on Inspiration Consolidated Copper Company property. Its location is not adequately known to define its aesthetic impact.

Aesthetic impacts can usually be effectively mitigated by landscaping and architecturally pleasing building design.

Financial

- Effect of treatment plant cost on community.

As discussed in the section on aspects common to all alternatives, a multitude of factors must be considered in the cost impact of alternative projects. At present, it is possible to rank the the alternatives in order of cost, but it is not possible to evaluate the efficiency and equity of a cost allocation scheme as development of such a scheme has not been undertaken.

The cost estimate of the alternatives falls into two distinct ranges. Three alternatives show a construction and 20-year operation cost of $3.1 million or less; the other four equal or exceed $6.5 million.

- Effect of treatment plant location on property values.

As previously discussed, the solution of present wastewater treatment problems may have a beneficial effect on property values. While this effect may be somewhat offset by the increase in the amount of developable land that may be realized as a result of sewer service extension, all alternatives will have the same impact with regard to both of these factors, and they have all been rated neutral in the matrix with regard to impacts on property values on an area-wide basis.

Site-specific property value impacts, if they materialize, would be most extreme in those areas where a sewage treatment plant is least likely to be compatible with future uses. Thus, adverse impacts are noted under Alternative 1 (zoned residential). Plant location at existing plant sites or on copper company land should have little effect on property value and has been rated neutral. It is not possible to judge the property value impact of a lower Pinal Creek site, and this impact has been rated problematical.

- Effect of treated effluent spray disposal on value of U. S. Forest Service exchange land.

Within the Tonto National Forest, land is presently being and probably will continue to be exchanged for other parcels of land. The purpose of these land exchanges is to consolidate land within the National Forest into more contiguous zones. It could be anticipated that spray disposal of effluent on National Forest land could degrade the value of this property with regard to any potential future land exchange, because it may represent an irreversible use of the land. The value of the land for grazing use would probably be enhanced. Adverse impacts arising from spray disposal upon National Forest Service land might occur through implementation of either Alternative 1B or Alternative 2B.

- Utilization of existing Phase I interceptor facilities.

Prior to initiation of this Environmental Impact Statement, Phase I interceptor facilities were constructed between the junction of Pinal Creek and Miami Wash upstream to the general area of the existing Globe lagoons, as well as a branch interceptor up to the existing Cobre Valley Sanitary District plant. When conforming with EPA requirements for the cost-effective analysis, the cost of existing facilities cannot be included. In other words, it is a "sunk" cost. The "sunk" cost of these facilities is necessarily a cost which residents in the study area must ultimately pay via retirement of bonds, thus it represents a monetary impact upon the community. If these existing facilities are abandoned or not used in the treatment-disposal alternative ultimately selected, an adverse impact would result. Alternatives 1, 2A, 2B would not utilize existing Phase I interceptor facilities, and therefore, have an adverse impact. All other alternatives do utilize these existing facilities and, therefore, represent a beneficial impact.

- Utilization of existing Cobre Valley Sanitary District plant.

As discussed relative to the existing Phase I interceptor, the abandonment of existing facilities represents a cost since the cost of these facilities still must be paid. The existing Cobre Valley Sanitary District plant, a relatively new plant, would be abandoned in Alternatives 1A, 1B, 1C, 3, 4 and 5; and therefore these alternatives have an adverse monetary impact. Alternatives 0, 2A and 2B would use this facility and would have a beneficial social impact relative to payment for this treatment plant.

Land Use

- Effect of treatment plant on adjacent zoning.

Selection of treatment plant Site 1 would place the treatment plant in an area currently zoned residential (T-1-N, R-15-E, Section 4). The zoning district is R1-D18, meaning that the area is designated for single family houses on lots of no less than 18,000 square feet. It is within the authority of a municipality to utilize land in any zoning area for a public purpose, and the municipality is not required to demonstrate compatibility. However, it would appear that treatment plant location in a residential district may have adverse zoning impacts.

Continued use of existing sites would result in no change in the zoning compatibility in those areas.

North of Section 4 in which Site 1 is located, land along Pinal Creek has not been zoned by Gila County. Development may take place in this area without regard either to use or to density. Thus, the question of compatibility with zoning does not arise and the impact of this site selection on zoning would be neutral.

A site on Inspiration Consolidated Copper Company land north of Miami would probably be zoned for manufacturing, with which a sewage treatment plant would be compatible. This compatibility has been assumed pending site specification. Impact is judged to be neutral.

- Compatibility with land use planning.

The alternatives proposed would involve treatment plant development either on the same sites as are now used for that purpose (Alternatives 2 and 5), on land presently vacant (Alternatives 1 and 3), or on Inspiration Consolidated Copper Company land not currently in mining or smelting use (Alternative 4). Where no change in use is proposed, the impact is rated beneficial. This has been interpreted as the case both for Alternative 2 and Alternative 4. In the other cases, vacant land possibly near existing residences poses compatibility problems and the impact has been judged adverse. However, specific site selection and plant design could substantially mitigate this impact.

Impacts of No Action

The no action alternative involves the consequences of not proceeding with any of the proposed alternatives. The existing plants and processes for sewage treatment and disposal would remain in effect for the entire area.

The impacts expected with no action are:

- Failure to comply with Federal Water Pollution Control Act (P.L. 92-500) and EPA waste discharge (NDPES permit) requirements.

- Subjection to fines because of failure to comply with NDPES permit requirements.

- Continuance of public health hazard by discharge of improperly treated raw sewage at the Globe and Miami sewage lagoons.

- Potential devaluation of residential land because of lack of adequate sewage treatment facilities.

- Potential slowing or stopping of residential or business development because of lack of adequate sewage facilities.

V. THE RECOMMENDED REGIONAL WASTEWATER TREATMENT AND DISPOSAL PLAN

Alternative Review and Selection

The eight alternative plans and the no action plan were described, discussed and evaluated in relation to the natural and human environment comprising the Greater Globe-Miami area. Several environmental impacts and social issues were found to be important and relevant to the selection of an implementable project. All of these are discussed in detail in the foregoing text. A summarizaton of interfaces between the environment and the alternatives is weighed and graded in Table 23. In the Draft Environmental Impact Statement, a judgment was made concerning the ranking of these alternatives relative to their suitability for the Globe-Miami area.

The Draft Environmental Impact Statement identified three alternatives which were considered to be favorable:

- Alternative 2A: Subregional aerated lagoons located at the present Globe and Miami treatment plants with effluent disposal into percolation ponds.
- Alternative 3: Regional aerated lagoons located near Pringle Springs with effluent disposal into percolation ponds.
- Alternative 5: Regional aerated lagoons near the present Miami treatment plant with effluent disposal into percolation ponds.

The Draft Environmental Impact Statement identified Alternative 3 as the recommended plan because it was believed to achieve the widest regional benefits without disruptive environmental, social or monetary impacts.

The recommended plan in this Final Environmental Impact Statement has been changed from Alternative 3 to Alternative 2A. This change has been made as a result of the information derived from the comments on the Draft Environmental Impact Statement (see Chapter VII) during the 45-day public review period. Those comments revealed that there exists considerable opposition to the site location proposed in Alternative 3, particularly from several Wheatfields residents and the Inspiration Consolidated Copper Company. Also, several comments highlight the difficulties expected in the institutional

Table 23

SUMMARY EVALUATION RATING AND RANKING OF ALTERNATIVE PLANS*

Impacts	Alternative Plans 0	1A	1B	1C	2A	2B	3	4	5
ENVIRONMENTAL IMPACTS									
Alteration of Pinal Creek vegetation and wildlife	A	N	N	A	N	N	N	N	N
Soil disturbance and erosion	N	A	A	A	A	A	A	A	A
Surface flow in Pinal Creek	A	N	N	A	N	N	N	N	N
Groundwater elevation and surfacing	U	N	N	A	A	N	N	N	A
Groundwater mineral quality	N	N	N	B	B	N	B	N	B
Groundwater bacteria and virus	A	N	N	A	A	N	A	N	A
Flood hazards	A	N	N	N	N	N	N	N	N
Noise vs. humans	N	D	D	D	N	N	N	N	N
Odor vs. humans	D	D	D	D	A	A	N	N	N
Energy consumption rank	N	6	4	1	3	7	2	8	5
Air quality	N	A	A	A	A	A	A	A	A
Water supply and reuse	N	B	A	N	N	A	B	B	B
Nuisance insects	A	N	A	A	A	A	A	N	N
Sprayed effluent and public contact	N	N	A	N	N	A	N	N	N
Aesthetics	D	D	D	D	U	A	N	N	N
Archeology	N	N	U	N	N	U	N	N	N
Land use conversions	N	A	A	A	N	A	A	N	N
Construction activities	N	A	A	A	A	A	A	A	A
SOCIAL IMPACTS									
Land use compatibility	D	D	D	D	N	D	N	N	N
Growth inducement/accommodation	D	B	B	B	B	B	B	B	B
Local opposition	A	A	A	A	B	B	A	B	B
COST IMPACTS									
Capitol cost rank	N	7	6	5	1	3	4	8	2
Operating cost rank	N	6	7	5	2	4	1	8	3
Local cost rank		5	7	6	2	4	1	8	3
OPERATIONAL RELIABILITY	A	A	A	A	B	A	B	A	B
INSTITUTIONAL AND LEGAL COMPLIANCE	D	B	B	B	B	B	B	B	B
OVERALL RANK	+	5	6	7	1	4	3	8	2

* Key to Alternative Plan ratings:

- A Adverse
- N None
- B Beneficial
- D Disruptive
- U Undefined
- \+ Not viable

implementation of a truly regional wastewater treatment effort. In response to these realities, the cost and environmentally acceptable subregional alternative of upgrading and expanding the existing Globe and Miami treatment plants has been chosen the grant fundable recommended project.

Alternative 2A is expected to result in two separate projects for the incorporated communities of Globe and Miami, with adjoining unincorporated areas joining in at their discretion. The projects simplify the financial and contractual agreements needed for project implementation, hopefully expediting project completion. Capacity will be designed into the treatment plants to provide for the domestic flows of the entire regional area for a 20-year planning period.

Additional studies to verify the adequacy of the Globe and Miami treatment plant sites have been conducted. An analysis of soil percolation capabilities and flood hazard conditions at the proposed sites follow a more detailed description of the recommended project. The soils testing results prepared by Engineers Testing Laboratories, Inc. of Phoenix, Arizona are included as Appendix R.

The Recommended Plan -- Alternative 2A

In the recommended project, three treatment plants would be used to accommodate sewerage needs. Two treatment plants would be aerated lagoons and one would be the existing Cobre Valley Sanitary District treatment plant, which is operated by the City of Globe. Raw sewage from Miami would be conveyed to an aerated lagoon treatment plant located at the existing Miami lagoons site (Site 2). The new aerated lagoon facilities would occupy about 20 acres and have a treatment capacity of 0.8 mgd. Unincorporated areas such as Wheatfields, Claypool and Midland City could form local improvement districts and by contract connect to the Miami system.

The City of Globe would also be served by an aerated lagoon treatment plant which would be constructed on about 25 acres in the general vicinity of the existing Globe treatment plant. The 1976 capacity would be 1.4 mgd with possible expansion to 1.9 mgd in 1986. Unincorporated areas in the upper Pinal Creek watershed could contract with Globe for sewage treatment and disposal services.

Both the Miami and Globe aerated lagoon treatment plants would use percolation ponds for effluent disposal. The existing Cobre Valley Sanitary District plant would be maintained, and discharge would be continued to the nearby dry wash. This plant would have to be doubled in capacity in 1986 if additional unincorporated areas wish to be serviced.

Figure 27 shows the general locations of interceptors, the required pump stations and the three treatment plants. Because many of the interceptors and pump stations would service unincorporated areas, they would not be constructed until these areas form local improvement districts (LID) that contract with Globe, Miami or the Cobre Valley Sanitary District for treatment and disposal. Photographs in Figures 19 and 20 show the general environmental features where the new aerated lagoon treatment plants would be placed. It should be noted that in this alternative the existing Phase I interceptor extending from the confluence of Miami Wash and Pinal Creek to the City of Globe lagoon would be abandoned.

Alternative 2A has a 20-year period, 1976 present worth for capital and annual expenditures of $2,499,800. This represents a cost for full subregional development so that it can be compared to other alternatives. A summary of the capital and operating costs as well as the computation of the present worth is presented in Appendix M. The cost of the collection system and interceptors not common to all alternatives must be added to the alternative cost. Because several LID would not initially be prepared to contract with Globe or Miami, the initial project expense to serve only Globe and Miami would be somewhat less.

The development of Step 1 grant facilities plans by Globe and Miami will identify the actual costs for projects to serve their two communities. For example, the capital cost (present worth) for the total project was estimated at about $2.5 million and the portion of this attributable to the interceptor and two pump stations serving Wheatfields was about $0.5 million. Consequently, if the Wheatfields area chooses not to form a LID and contract with Miami for treatment and disposal, something more than 20 percent of the capital cost would be subtracted. Other interceptors and pumps also fall into separable categories and would also reduce the initial project cost if the unincorporated areas choose not to join either Globe or Miami. If agreements can be reached, local improvement districts may be included in the initial Globe or Miami facilities plan or they may delay their action to a later date when they would initiate their own action.

This plan can provide wastewater treatment and disposal to the total community with reliability. Raw wastes typically rely on gravity flow. The treatment and disposal system is the least complex of those meeting EPA standards and therefore requires fewer skilled operators and is more resistant to biological or mechanical malfunction. Population growth and land development can be accommodated throughout the project area. Local concerns about noise, odor, contamination of domestic water supplies, surface flow in Pinal Creek and cost seem to be mitigated to a satisfactory degree by this alternative. The matter of rising groundwater as cited in the Bixby lawsuit is still a matter that is unresolved, and without the expenditure of large amounts of money during different water years to investigate the groundwater and geology in detail, the Bixby contention will remain unresolved. It is proposed, however, that responsible local, state and federal officials monitor and mitigate the rising groundwater situation in the lower Pinal Creek drainage area and continue to pursue reclamation possibilities for the future. The disposal option of intermittent seasonal percolation of effluent during drier periods will be further studied during the design phase of the project.

Additional Study Results -- Suitability of Effluent Disposal Ponds

Field percolation tests were identified as the most appropriate means for testing how well the soils in the disposal pond areas would allow effluent to percolate.

Inspiration Consolidated Copper Company and Cobre Valley Sanitary District readily gave their permission to conduct percolation testing on their properties near the existing City of Globe oxidation pond and the existing City of Miami ponds.

Eleven potential percolation test sites were selected; five in the vicinity of the Globe pond and six in the vicinity of the Miami ponds. At each of the eleven sites, three borings were made; one to 5 feet, one to 10 feet and one to 30 feet in depth. The materials encountered were described, properties of the materials noted, the depth to groundwater recorded (where encountered), and constant head percolation tests conducted after overnight saturation of the test holes. Complete test results are included as Appendix R.

The tests indicate that effluent disposal by percolation to groundwater is feasible in both locations under Alternative 2A. Pond areas totaling about 5 acres should be adequate in each case, although provision for increasing pond sizes should be made in case actual operations dictate a larger area due to gradual loss of percolation qualities.

Globe Area

In the area near the Globe oxidation pond, one test location was selected in the tailings containing the existing pond. Percolation rates in this material, while not as rapid as natural sand and gravels along the creek, were surprisingly good. The percolation rate below the tailings was sufficiently great to prevent filling of the 7-inch diameter hole, even with water being pumped in at a rate of about 30 gallons per minute. Borings 2 and 3 just upstream from the existing pond showed excellent percolation qualities, except for the top 5 feet in test hole 2.

Test holes 4 and 5, about 4/10 of a mile downstream from the Globe pond and on the west side of the road in a flat area near the Cobre Valley treatment facility, showed unacceptably slow percolation rates. Boring 4 encountered rock at 17 feet. This area was excluded from further consideration as a disposal site.

The results of borings 2 and 3 show that additional ponds would be feasible upstream of the existing Globe pond and in the area between Pinal Creek and the gravel road. From currently available topography data, it appears that about 4 acres of ponds could be constructed in this area. About 2.5 acres of ponds would be required to percolate 1.4 mgd of effluent, using the worst percolation rate of the three test locations. A minimum of 5 acres of ponds should be considered to enable periodic maintenance and to compensate for possible gradual loss of percolation qualities in long-term use. Additional ponds could be excavated in the tailings adjacent to the existing Globe oxidation pond to meet these area requirements.

Visual inspection of the creek downstream of this point indicates that occasional rock outcroppings occur. It appears possible that percolated effluent could surface at some distance downstream. During periods of wet weather with relatively high groundwater in the creek, the probability of effluent surfacing would be greater.

Miami Area

Near the existing Miami oxidation ponds, six borings were made; two on the west side of Miami Wash and four on the east side. Of those on the east side, two were taken upstream of the new Highway 88 bridge crossing and two downstream. Borings 8 and 9, taken on the west side of the wash, just upstream of the bridge, showed unacceptably low percolation rates. Percolation ponds on the west side of Miami Wash were therefore excluded from further consideration.

Borings 6, 7, 10 and 11 on the east side of the Miami Wash showed excellent percolation qualities. Two of the 5-foot deep holes could not be filled with water at a discharge of about 30 gallons per minute. In the 10-foot test holes, three of the four borings also could not be filled. Percolation tests were not taken in the 30-foot holes, since groundwater was encountered at each of the test sites at depths ranging from 18 to 23 feet.

Percolation data indicate that less than 1 acre of pond area would accept the total design flow of 0.8 mgd from the City of Miami ponds. However, installation of about 5 acres of ponds is recommended to allow for loss of effectiveness due to partial clogging and to allow for maintenance of ponds on a periodic basis.

Three locations appear feasible for the Miami disposal ponds: directly across Miami Wash from the existing oxidation ponds; several hundred feet downstream where some diked areas presently exist; or downstream of the new Highway 88 bridge.

During wet years high groundwater may adversely affect the operation of the disposal ponds. If the groundwater level is at or near the bottom of the percolation ponds, the percolation rate may be slowed and a groundwater mounding effect created around the ponds. This could result in some groundwater surfacing in the immediate vicinity of the ponds in a very wet year.

Flood Hazard

The flood hazard potential was reviewed for the Globe and Miami percolation pond disposal area described for Alternative 2A. Protection from a 10-year storm at the Globe location appears practical and desirable. Protection against greater frequency floods may not be practical. In the case of the Miami ponds, 10-year protection may already exist from the levees along Miami Wash. Greater protection appears feasible but would raise the flood level in the floodplain by as much as 1 foot for the standard project flood, a possibly undesirable consequence.

In order to evaluate the flood hazard, data developed by the Corps of Engineers (Interim Report of the District Engineer on Survey for Flood Control, Pinal Creek and Tributaries, Arizona, 1961) together with the Globe, Arizona USGS 7-1/2 minute quad sheet dated 1945 were used. Cross sections were drawn using the 25-foot contours and other map data combined with visual field inspection. For the Globe ponds, normal depths were computed for relatively confined reaches of Pinal Creek upstream and downstream of the proposed ponds. Profiles were then estimated for the intervening sections of the creek for the 10-year, 100-year and standard project floods. Along Miami Wash, normal depth capacity calculations were performed for the existing leveed creek channel. Normal depth capacity calculations were also performed for the floodplain west of the railroad tracks at several flooded depths, both for existing conditions and with pond levees (obstructions) in place.

Globe Ponds

Computations at the proposed Globe ponds indicate that the 10-year flood along Pinal Creek would encroach upon the area that is suitable for additional ponds. The area could easily be protected by using rock slope protection along the creek face of the pond levees. This would obstruct the flow slightly and have the effect of raising the 10-year flood level by less than 1 foot along the protected levees. This should not create any problems at this location.

From inspection of the profile, it does not appear practical to protect disposal ponds against the 100-year flood. The large levees would raise the water surface by more than 1 foot and would entail more elaborate construction. Whether protection against the 25-year flood would be practical would require further study with more detailed topography and pond design information.

Protection against the standard project flood would not be practical. Such a flood would probably overtop the gravel road, flood out the ponds and probably damage or destroy the levees. Flow velocities were computed at slightly over 10 feet per second for the 10-year flood, and about 17 feet per second for the standard project flood.

The cost for protecting the percolation ponds along Pinal Creek was estimated at $10,000 to $20,000, depending upon actual location of the ponds relative to the creek and materials used. Replacement would be required once every 10-25 years, depending upon actual protection provided, and further depending, of course, upon the timing of major floods.

Miami Ponds

In the case of the Miami ponds, computations indicate a capacity in the existing leveed channel of Miami Wash of about 4,000 cfs. The Corps of Engineers projects a 10-year flow of 4,150 cfs in Bloody Tanks Wash upstream of its junction with Russell Gulch. Flood flows in Miami Wash would therefore be slightly greater than 4,150 cfs. The existing Miami Wash channel may be able to contain the 10-year flood. This would prevent floodwaters from affecting the proposed percolation ponds. However, relatively high velocities of nearly 11 feet per second may erode the levees and allow the 10-year flood to spread into the area where the ponds would be located. Such breakouts have occurred in recent years. Velocities on the floodplains after such a breakout would be less than 4 feet per second and might not present a threat to unreinforced dikes.

A greater flood, such as the 100-year flood (13,400 cfs excluding Russell Gulch), would break out of the levees. It would inundate most or all of the floodplain for a width of 1,000 feet and to a depth of 3 feet from the creek to the railroad tracks. The water would flow at a velocity of about 5 feet per second.

However, if percolation ponds were constructed in the floodplain, the levees would tend to obstruct the flow of water. Calculations indicate that a 250 to 300 foot wide levee in the 1,000-foot wide floodplain would raise the standard project flood (26,000 cfs excluding Russell Gulch) about 1 foot higher than it would otherwise be, and would raise the 100-year flood by about 6 inches. It would also tend to increase the velocity of flow by up to 1 foot per second as a result of the greater depth. This may have the effect of increasing damage in other areas of the floodplain.

Protecting dikes for 5 acres of ponds against higher frequency floods (particularly the 100-year and the standard project floods) would add about $20,000 to their cost. Rock protection would probably not be necessary for the dikes for protection against the 25-year and lesser floods since the velocities would be substantially less in the floodplain.

Unavoidable Adverse Impacts

The recommended plan retains adverse impacts which are unavoidable:

- The adverse impacts associated with construction of the project are given along with their mitigation measures in Chapter IV, Table 18. None are considered disruptive to the natural or social communities.
- Construction and use of the area will change the land form and cause soil erosion.
- The percolation of treated wastewater into the groundwater may allow some bacteria, viruses and parasites to enter the groundwater. The effluent will be chlorinated to meet state and federal public health standards.
- Population and economic growth in the area will increase the emission of pollutants to the air.
- Nuisance insects, mosquitoes and midge flies will grow in the treatment ponds and may fly to residential areas.
- Additional land in the area will be converted from natural landscape to treatment plant, residential, commercial, industrial and public use.
- The amount of electrical and fossil fuel energy will increase as a result of wastewater conveyance, treatment and disposal, and also by the growth associated with improved sewerage.
- Sewage systems occasionally fail and cause aesthetic and public health impacts.
- The cost of living or doing business in the project area will increase in response to improved wastewater collection and treatment facilities.
- The necessity of forming an operating authority through joint powers agreements or another mode, reduces the ability of smaller local entities to make unincumbered decisions.

Local Short-Term Uses of the Environment vs. Maintenance and Enhancement of Long-Term Productivity

All alternative wastewater treatment and disposal systems including no action involve the acceptance of trade-offs among beneficial and adverse project impacts. Selection of the most "cost effective" alternative is intended to result in the greatest beneficial effects obtainable at the least possible environmental, social and monetary costs.

The principal beneficial effects of the alternatives analyzed are the alleviation of adverse environmental effects related to existing inadequate wastewater treatment plants for Globe and Miami and malfunctioning individual septic tanks and cesspools. These inadequacies result in public health hazards, an unsightly and malodorous aesthetic environment and, by not complying with state and federal regulations, the inhibition of population and economic growth.

The recommended project would remove most of these adverse community level impacts. On the other hand, impacts probably seen as adverse by local citizens will be engendered. These impacts relate to increased taxes and service charges and interference with their ability to provide individual treatment systems. Local government must jointly be responsible for the completion and operation of the project which adds to the responsibility and complexity of local government.

The recommended "cost effective" project generally responds to the adverse community impacts by avoiding some and lessening the total impact of the others. It reduces the concerns expressed by individual citizens relating to wastewater treatment and discharge near the confluence of Pinal Creek and Miami Wash.

This alternative will generally have the adverse impacts on natural resources shown in the preceding section. However, when balanced against the need to provide sewerage for organized and planned social and economic growth without significant hazard to public health or aesthetics, the project should assist in the maintenance of the long-term environmental productivity of the area for humans and other life resources. The short-term use of many physical portions of the environment is convertible to other uses in the long term.

Irreversible and Irretrievable Commitments of Resources

Minor and major irreversible and irretrievable commitments of renewable and non-renewable resources will occur. Significant commitments of general irrecoverable resources, i.e., time, building materials and energy, will be required during project construction.

After construction, operation of the treatment plant will require irrecoverable resources such as time, chemicals, energy and maintenance materials.

The secondary effects of population growth result in the conversion of open, natural land to urban development, reduction in air quality, increased use of water, electricity, petroleum products, timber and food, and increased demand for social services. If growth occurs in a reasonably well conceived manner, none of these effects are forecasted to be significantly adverse. However, much of the area is not zoned or regulated to obtain the best foreseeable growth uses and unless this situation is altered, adverse impacts are more likely to occur.

VI. IMPLEMENTATION AND ISSUES TO BE RESOLVED

Although a grant-fundable project is determined and described in concept in this EIS, there remain several actions which must be taken to reach construction and operation. Several needed local actions are dicussed briefly. The details can be readily determined during the preparation of Step 1 facilities plans by Globe and Miami.

Before a project can proceed to construction, a financial and revenue plan must be developed and implemented. This action usually requires elections for bonds and/or annexations. Agreements establishing the sewerage authority would be expected to result from and in accordance with the financial plan and revenue program.

An issue discussed but not resolved in the EIS pertains to the relationship between wastewater disposal and the occasional flooding of fields owned by Mr. Stephen Bixby. In our conversations with Mr. Bixby, it was concluded that his fields have flooded as a result of rising groundwater. Available information does not allow one to describe the groundwater system in sufficient detail to determine whether such flooding would be intensified by the disposal of water upstream of his property. One may assume that water added upstream adds some increment to the elevation of the groundwater, but whether this increment is significant or not to the total elevation is undeterminable without performing long-term investigations of the groundwater system. Efforts will be made during the design of the treatment plants to minimize the probable occurrence of rising groundwater downstream by providing for the intermittent disposal of effluent upon percolation beds. During wetter seasons, the wastewaters could be stored in sealed ponds designed for that purpose. Also, future reclamation possibilities will continue to be pursued.

VII. COMMENTS AND RESPONSES

A Draft Environmental Impact Statement on the Greater Globe-Miami wastewater treatment project was issued in January 1976. Public hearings were held in Globe, Arizona on February 18, 1976 at 1:30 p.m. and again at 7:30 p.m. Transcripts of these hearings are included in Appendix S. Most comments received at these public hearings dealt with cost and financing aspects of the recommended project rather than with the Draft EIS *per se*. These comments which dealt with the Draft EIS have been dealt with through revisions incorporated into the text of the Final EIS.

In addition to testimony at the public hearings, numerous letters have been received commenting on the Draft EIS and the alternative projects. Many of the comments contained in these letters have resulted in revisions incorporated into the text of this EIS. Other comments require a separate response. The following pages present a copy of the notice of public hearing and copies of all letters of comment received through March 31, 1976. Letters requiring additional responses are presented first, followed by those letters which are either self-explanatory or for which all response has been made through changes in the text of the EIS.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Review of Draft EIS for the Greater Globe-Miami Arizona Wastewater Treatment Project

DATE: FEB 26 1976

FROM: Kenneth E. Biglane, Director
Division of Oil and Special Materials Control (WH-548)

TO: Paul DeFalco, Jr.
Regional Administrator, Region IX

Attn: Mark Zuckerman

RECEIVED
E.P.A. REGION IX
MAR 1 1 34 PM '76

The comments of the Office of Water Program Operations on the subject EIS are enclosed. Should any of the issues raised in these comments require clarification, please contact Geraldine Werdig, Chief, Environmental Evaluation Branch (202) 245-3054.

Project Description

Location: Globe and Miami, Gila County, Arizona

Description of Proposed Action:

The construction of a regional wastewater treatment system consisting of an aerated lagoon with percolation pond disposal, and collection systems.

Eight alternatives were considered, including different sites, treatment methods, and disposal techniques.

Major Issues:

Public controversy over earlier plans concerning the location of the facility and lack of public hearings.

Project Reviewer: David A. Eberly

Enclosure

EPA Form 1320-6 (Rev. 6-72)

Office of Water Program Operations
Comments on the Draft EIS
Greater Globe-Miami, Arizona
Wastewater Treatment Project

1. The discussion of population projection appears to be contradictory. On page 10, mention is made of the stifling effect of the presently inadequate sewage treatment on growth. On page 20, the estimated duration of present mining production levels is about 30 years. The EIS brings out the dependency of the area on the copper industry. On page 34, the discussion of water supply for the Miami and the unincorporated areas includes the conclusion that the population in the area is not expected to change much in the future.

   Population growth due to employment from manufacturing is expected to be moderate (p. 43), yet table 7 shows that from 1960 to 1970 employment by manufacturing increased from 178 to 1493. Also "the effect of the present ownership pattern is to restrict the supply of land available for residential and other private development."

   The population projections show an increase for the service area of 72% for 1970 to 1990 (16,155 to 27,000). From 1960 to 1970, Miami increased by 44 people, Central Heights lost 197, Claypool lost 260, Globe gained 1116 and other unincorporated areas gained 862. Thus from 1960 to 1970 the gain was 9%.

   In light of the above, we do not understand the basis for the population projections, particularly the 53% increase for Globe for 1970-1980. Many other statements that appear contradictory appear throughout the EIS, in addition to the above, and should be revised to reflect the basis for the projections. Also, a stronger rationale is needed for the projections.

2. Sulfur dioxide, heavy metals, and particulate matter are monitored in the Globe-Miami area (p. 15), yet Table 2 on page 18 shows only the data for particulate matter and sulfur dioxide. Since concentrations of copper and lead occasionally violate air quality standards (p. 17), the data for heavy metals should be included.

3. The use of 1946 data for water quality in the area does not seem relevant 30 years later. We suggest this be deleted.

4. The list of constraints on page 57 should include the comprehensive plans for the area. According to page 54, Gila County, Globe, and Miami have all adopted comprehensive plans. No mention is made anywhere in the EIS of the conformance of the proposed action with these comprehensive plans.

5. In the discussion of the no action alternative (p. 80) one of the disadvantages discussed was the effect of additional growth on the already overloaded facilities. Page 10, however, mentioned the retarding effect on growth of no action and page 47 states that Miami has a ban on sewer connections. The statement on page 80 requires clarification.

6. The existing treatment plant for Miami has an inflow of 0.25 MGD and a discharge of 0.14 MGD (p. 18). This should be explained.

7. The discussion on the effects of percolation on groundwater quality and quantity are confusing. Apparently, the second paragraph concerns the quantity, although entitled quality, and the concluding statement does not apply to quantity but to quality.

8. Appendices J-Q are entitled the Cost Effectiveness Evaluation of the alternatives. The discussion on page 57 correctly explains that cost-effectiveness is determined by monetary, social and environmental costs. The appendices give only the monetary costs and are therefore only partial cost-effectiveness evaluations.

9. The EPA supplement to the Report for Alternative Waste Management Techniques for Best Practicable Waste Treatment (Federal Register, Vol. 41, No 29, February 11, 1976) presents the criteria to be met for the groundwater resulting from application of wastewaters. The criteria should be considered in the EIS.

10. In the future, will you please send us a copy of the pre-draft version of EIS's for review. This is in accordance with Appendix C, Section IV, of the April 14, 1975 Regulations for the Preparation of Environmental Impact Statements.

Responses to comments from the EPA, Office of Water Program Operations, February 26, 1976

Comments 1, 2, 4, 5, 6, 7, 8 and 9 have been dealt with in the text of the Final EIS. In regard to Comment 1, no attempt was made during preparation of this EIS to develop a special demographic or econometric projection for the Globe-Miami area. In regard to Comment 4, the EIS points out the relationship between zoning and comprehensive planning in Arizona. Since there is no requirement for consistency between zoning and comprehensive plans, the EIS analyzed alternative sites for compatibility with existing zoning.

Comment 3: The use of 1946 data for water quality in the area does not seem relevant 30 years later. We suggest this be deleted.

Response: This data is the only groundwater quality data available for the upper watershed areas. In addition, there does not appear to have been much change in land use or other factors in these upper watershed areas during the last 30 years. Thus, there is no *a priori* reason to expect a substantial change in groundwater quality in these areas.

UNITED STATES
DEPARTMENT OF THE INTERIOR

OFFICE OF THE SECRETARY
PACIFIC SOUTHWEST REGION
BOX 36098 • 450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102
(415) 556-8200

ER 76/52

RECEIVED
REGIONAL HEARING CLERK
MAR 22 1976
REGION IX

March 16, 1976

U. S. Environmental Protection Agency
Attn: Hearing Office HE-126
Region IX
100 California Street
San Francisco, CA 94111

Dear Sir:

The Department of the Interior has reviewed the draft environmental statement for the Greater Globe--Miami Wastewater Treatment Project, Gila County, Arizona.

General Comments

We suggest that photographs be identified in the text by figure and page numbers. Also the maps and figures should show legal subdivisions. Three maps (Figures 2, 9, and 10) do not indicate the scale.

The statement provides a good general discussion of fish and wildlife resources, and habitats and project impacts on these resources. However, specific fish and wildlife species are not identified within the project area. The statement fails to identify what effects the various alternatives would have on these species.

In general, the professional engineering studies of alternatives appear to have been reasonably extracted and reported by the writers of the environmental impact statement.

Specific Comments

Page 1--The method of deriving environmental social and cost impacts should be clarified.

Page 4--The reference to the "no recently recorded earthquake" should be supported by the date of the last one.

Page 9--The listing of references in the Bibliography shows most of the biological information to be somewhat out-of-date, particularly the use of C. H. Merriam, 1890 (page 142), as the basic reference.

Page 14--The reference to Notice of Intent does not state if this complies with DEZ guidelines for using OMB A-95 Clearinghouse procedures. The responses to the Clearinghouse A-95 procedures should be a part of the record.

Page 15--We question whether the area is part of the lower Sonoran Desert physiographic province.

Page 19-20--The discussions of soils and geology would be more useful if the suitability of the various soils and near-surface bedrock as foundations for the proposed installations and the stability and resistance to erosion of the soils during excavation were described.

Page 20--The environment of the project area is not adequately described. The geology and ore desposits of the Globe-Miami mining district is referenced, but the impact statement lacks a description of geology in the project area. For instance, the installation of sewer lines might encounter igneous rock necessitating costly blasting or all sewers could be laid in readily excavated trenches in alluvium. More significantly, the proposed lagoons could lose excessive water because of highly permeable formations or the presence of caliche could preclude effective use of percolation ponds. The mining activity or mineral resource development could be adversely affected by implementation of the proposed project.

Page 21--The reliance upon Merriam has led to the inaccurate classification of vegetation as a paloverde-saguaro community.

Page 22--A deficiency in factual data also is evident where it is stated that eight species of endangered wildlife could occur within the study area. The reader (and the decision maker) still does not know if any endangered species are actually present in the project area or if the proposed project will affect members of an endangered species.

Although several unlikely species are included, no mention is made of the spotted bat, Euderma maculata, or the Southern bald eagle, Haliaeetus l. leucocephalus. These two should be added.

Page 23--Table 3, "Rare and Endangered Wildlife Whose Distribution includes the Globe--Miami Area" and the narrative on "Rare and Endangered Wildlife" (page 22) are confusing. These sections should be changed to reflect the official status as shown in the "United States List of Endangered Fauna" (May 1974). The March 1973 publication "Threatened Wildlife of the United States" is not an official list, but may be used as a reference and source of background information.

Pages 24-27--This should clarify the lack of recognition of Yavapai presence, the placing of European Americans as farmers and ranchers prior to 1850, the placing of Pimas and Papagos in eastern Arizona, the confusion of Phoenix in contextual sense, the assignment of Hohokam and Salado to separate areas when their sites occur side by side or stratified, the extensive irrigation of "wild mesquite beans" by the Hohokam, the lack of reference to the National Register of Historic Places, the misidentification of the Office of the State Historic Preservation Officer, the apparent avoidance of any contact with the Anthropology Departments at the University of Arizona, Arizona State University, Northern Arizona University, Prescott College, or Southern Illinois University, or the Arizona Archeological Center (NPS), the inadequate references to the Mescalero Indians of east-central New Mexico, and the mididentification of Dr. Gummerman.

Page 27--The sixth paragraph appears to be internally inconsistent. Also the statement that "the project lies in...and is part of the Salt River project" needs to be clarified. The author apparently misinterpreted the information obtained from the Miller report. The EPA fund-supported project for Globe-Miami is not part of the Salt River Project, which was constructed under the Reclamation Act.

Pages 27, 29, 31, 49 and 51--Allegations blaming the mining industry for occurrences of water and chemical pollution and for the high mineral content of ground waters, are not supported by facts cited in the text. In any mineralized area, natural oxidation of exposed sulfide minerals will produce metal salts and mineral acids that will enter the ground water. To imply, without factual data, that the presence of these agents in the project area ground water is solely the result of mining and milling activities, as on pages 31 and 49, is incorrect. Moreover such statements as, "Mining operations damaged lower Pinal Creek land and water" (page 51), are not germane to the impact statement, casting doubt on the document's objectivity.

Pages 30-31--Since ground water is involved in the consideration of all alternatives, we believe that the statement should include somewhat more data on the existing round-water situation. Data specifically needed in the appraisal of the evaluation include: (a) enough water levels or depths to water from existing wells to provide a basis for at least generalized conclusions as to the principal directions of ground-water movement within the project area; (b) aquifer transmissivities or specific capacities of representative wells; (c) a map showing the approximate locations of community supply wells, industrial wells, and perhaps representative private wells for which water levels or other information might be available; and (d) logs of wells.

Page 33--The last statement appears to be subjective and should be modified by an analysis in relation to "per customer." On an assumed four persons per household (customer), a use of 69 gpcpd appears low.

Page 49--The phrase in paragraph 5 "As a result of earth movement..." should be clarified to remove the possible inference of seismic activity of major extent.

Page 54--The statement is made that "Although some mining company property has been sold in recent years, the reluctance of mining firms to diminish their holdings is widely removed." This sentence should be clarified.

Page 53--Land use planning by both the U.S. Forest Service and Bureau of Land Management is not mentioned.

Page 55--We believe the following statement should be clarified: "A principal, local objective related to the lack of consideration of alternative wastewater treatment projects which some members of the public believed to be more desirable."

Page 58--The following sentence is also confusing: "The connection of roof drains to sewers may be prohibited by ordinance, detected and enforced which will reduce peak flows during rains or collection systems may be repaired or replaced to reduce the infiltration of subsurface waters."

Page 73--The land ownership on Site 2 should be further described.

Page 104--The list of temporary impacts and mitigating measures does not include spills of fuels, etc.

Page 105--We are pleased with the attention that has been given to cultural resources in the draft statement. It appears that the proposed wastewater treatment plant sites have been adequately surveyed. After detailed pipeline routings and pumping station sites have been selected, we recommend that they be subjected to an intensive surface archeological survey by a professional archeologist. Such a survey would be more feasible and more easily implementable than would the "subsurface reconnaissance survey," mentioned on this page of the draft statement.

If significant cultural resources are identified by the survey they should be described and evaluated for their National Register potential. If they meet the criteria for nomination set forth in Title 36, CFR 800.10, they should be nominated to the National Register of Historic Places and the procedures outlined in Title 36, CFR 800.4 should be followed. A copy of the survey report should be made available to the National Park Service, Western Archeological Center, P. O. Box 49008, Tucson, Arizona 85717, and a summary of the report should be included in the final statement.

The statement should also include a copy of the Arizona State Historic Preservation Officer's comments regarding the effect of the project upon properties either listed on or in the process of nomination to the National Register of Historic Places. The statement should indicate that the National Register of Historic Places has been consulted and that no National Register properties area to be affected by the project.

The final statement should contain a commitment to stop construction and to consult a qualified archeologist if buried cultural resources are uncovered during construction. Such a procedure was recommended by Tony F. Weber in his archeologist report contained in Appendix C of the draft statement.

<u>Page 116</u>--The invertebrate dragonfly is erroneously identified as a crustacean.

<u>Page 118</u>--It appears that recognition of the potential contribution to or interference with water rights or pollution of the Salt River Project has not been considered.

<u>Page 133</u>--Although alternative 3 may represent the best compromise with respect to the many different goals needs and influences listed on this page, the selection of this alternative is somewhat surprising because it is neither the less costly nor the most energy efficient alternative available.

In addition, the placement of the treatment plant and percolation ponds several miles from the communities they serve increases pipeline and pumping costs and assures that no recharge of the aquifer from which the water originally was drawn will occur. Because water use in the project area exceeds aquifer replenishment, and since greater future withdrawals for the community and the mining industry are anticipated, no wastewater treatment method that fails to provide for re-use of treated effluent or direct recharge of ground water should be considered. All three of the "viable" alternatives listed on page 131 utilize aerated lagoons with percolation disposal ponds and would represent significant evaporative water losses.

We suggest that provision should be made for verifying with reasonable certainty the feasibility of recharging the principal aquifer through the percolation ponds at the specific locations chosen near Pringle Springs. (Perhaps data from existing wells or test holes would serve the purpose.) Such a preliminary step could be a significant mitigating measure, for the possible presence of one of the impermeable zones of the Gila Conglomerate beneath the percolation ponds could either negate the ground-water salvage aspects of the project or cause "short circuiting" of the effluent flow to the land surface or to streamflow.

Page 148 Appendix A--The creosote bush should be added to the list of species.

Page 149 Appendix B--The list of "Wildlife Species Characteristic of the Sonoron Desert Region of Arizona" should be more specific to the project area.

We appreciate the opportunity to review and comment on the draft statement.

Cordially,

Webster Otis

Webster Otis
Special Assistant to the Secretary

cc: OEPR w/c incoming
Regional Director, FWS, Albuquerque
Regional Director, BOR, San Francisco
Regional Director, NPS, San Francisco
USGS, Reston, Attn: Larry Bonham
Director, BOM, D.C.
State Director, BLM, Arizona
Regional Director, BuRec, Boulder City
Area Director, BIA, Phoenix

Response to comments from the Department of the Interior, March 16, 1976

Comments relating to Draft EIS pages 4 (sic; page 20), 14, 21, 22, 23, 27 etc., 33, 49, 54 (sic; page 51), 58, 73, 104, 105, 116, 118 and 148 have been dealt with in the text of the Final EIS.

Comment: Page 1 -- The method of deriving environmental social and cost impacts should be clarified.

Response: This comment appears to have no relationship to the material presented on page 1 of the Draft EIS. The appropriate page reference has not been identified.

Comment: Page 9 -- The listing of references in the Bibliography shows most of the biological information to be somewhat out-of-date, particularly the use of C. H. Merriam, 1890 (page 142), as the basic reference.

Response: Merriam (1890) was cited as the originator of the "life zone" concept, not as the source of biological information used in the EIS.

Comment: Page 15 -- We question whether the area is part of the lower Sonoran Desert physiographic province.

Response: The EIS does not use the phrase "lower Sonoran Desert physiographic province". Reference was made to "lower Sonoran life zone" and to "Sonoran Desert"; these two phrases are not synonymous. Jaeger (1957) specifically cites the Globe area as an example of the "Arizona Upland Desert" subunit of the Sonoran Desert.

Comment: Page 19-20 -- The discussions of soils and geology would be more useful if the suitability of the various soils and near-surface bedrock as foundations for the proposed installations and the stability and resistance to erosion of the soils during excavation were described.

Page 20 -- The environment of the project area is not adequately described. The geology and ore deposits of the Globe-Miami mining district is referenced, but the impact statement lacks a description of geology in the project area. For instance, the installation of sewer lines might encounter igneous rock necessitating costly blasting or all sewers could be laid in readily excavated trenches in alluvium. More significantly, the proposed lagoons could lose excessive water because of highly permeable formations or the presence of caliche could preclude effective use of percolation ponds. The mining activity or mineral resource development could be adversely affected by implementation of the proposed project.

Response: The EIS was not intended to eliminate the need for a detailed facilities plan which should provide more detailed, site-specific data regarding soil and geologic conditions. The cost estimates in the EIS are only preliminary estimates in the absence of a detailed facilities plan. The results of the percolation tests performed in conjunction with preparation of this Final EIS indicate the complexity of geologic conditions in the area.

Comment: Pages 24-27 -- This should clarify the lack of recognition of Yavapai presence, the placing of European Americans as farmers and ranchers prior to 1850, the placing of Pimas and Papagos in eastern Arizona, the confusion of Phoenix in contextual sense, the assignment of Hohokam and Salado to separate areas when their sites occur side-by-side or stratified, the extensive irrigation of "wild mesquite beans" by the Hohokam, the lack of reference to the National Register of Historic Places, the misidentification of the Office of the State Historic Preservation Officer, the apparent avoidance of any contact with the Anthropology Departments at the University of Arizona, Arizona State University, Northern Arizona University, Prescott College or Southern Illinois University, or the Arizona Archeological Center (NPS), the inadequate references to the Mescalero Indians of east-central New Mexico, and the misidentification of Dr. Gummerman.

Response: Most of the above comments refer to Appendix 5, rather than to pages 24-27 of the Draft EIS. The material presented in the Draft EIS should be supplemented in a few regards. Low populations of Yavapai originally occupied areas east and northeast of Phoenix. A small band of Yavapai were relocated to the San Carlos Indian Reservation in the late 1800's. There are conflicting opinions as to whether the Hohokam irrigated mesquite or crops such as corn, beans and squash. The archeologists who prepared Appendix 5 have presented their opinion of the evidence.

The Pimas and Papago were present in southeastern Arizona (Spicer, Edward, 1962, Cycles of Conquest, University of Arizona Press, pages 262-265; Spencer, R., J. Jennings, et.al., 1965, the Native Americans, Harper and Row, page 291). The Draft EIS accurately states that the Hohokam and Salado were contemporaries in the Globe-Miami area, but that they chose different types of sites for their respective settlements. Typographical errors have been corrected in the Final EIS. The responses made to comments of Messers. Schoenwetter and Weaver should also be reviewed.

Comment: Pages 30-31 -- Since groundwater is involved in the consideration of all alternatives, we believe that the statement should include somewhat more data on the existing groundwater situation. Data specifically needed in the appraisal of the evaluation include: (a) enough water levels or depths to water from existing wells to provide a basis for at least generalized conclusions as to the principal directions of groundwater movement within the project area; (b) aquifer transmissivities or specific capacities of representative wells; (c) a map showing the approximate locations of community supply wells, industrial wells, and perhaps representative private wells for which water levels or other information might be available; and (d) logs of wells.

Response: Subsequent to release of the Draft EIS, percolation tests were conducted adjacent to the existing Globe, Miami, and Cobre Valley treatment plant sites. The results of these tests are presented in this Final EIS. The detailed groundwater data and well logs mentioned above would be quite useful, but are not available. No special groundwater study was authorized or conducted in connection with preparation of this EIS.

Comment: Page 149, Appendix B -- The list of "Wildlife Species Characteristic of the Sonoran Desert Region of Arizona" should be more specific to the project area.

Response: Due to the small acreage involved in any of the alternatives addressed in the EIS, the abundance of comparable habitat in the area, and the lack of literature references to any unique biological features in the project area, it was considered unnecessary to perform detailed biological field studies at the alternative project sites. Thus, the discussion of biological resources focuses mostly on a regional perspective.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
6029 Federal Building, Phoenix, Arizona 85025

February 4, 1976

U. S. Environmental Protection Agency
Attention: Hearing Office, HE-126
Region IX
100 California Street
San Francisco, CA 94111

Dear Sirs:

Following are the Soil Conservation Service's comments on the draft environmental impact statement, "Greater Globe-Miami Wastewater Treatment Project."

1. Page 34, Flood Control - The Corps of Engineers has a plan for flood control for the Globe-Miami area. There is also an approved application for PL-566 project assistance on Pinal Creek. Neither of these were discussed.

2. Page 35, 4th paragraph - This paragraph is not clear. What are you going to protect?

3. Page 39 - Suggest a watershed map showing relative locations of population centers within each watershed be used to better display this material.

4. Page 41, Future Trends - How are the population projections related to OBERS projections for the area?

5. Page 54, 2nd paragraph - Apparently EPA feels Arizona municipalities have the power to purchase land outside city limits for public purchases. We have not found that to be the case in our project activities. We have asked the State Land Department to help us get an attorney general's opinion on this question, and so far, have not received any answer from the Attorney General.

6. Page 117, Geology and Soils, 2nd paragraph, 3rd, 4th, and 5th sentences - Suggest these sentences be rewritten as follows:

> "The main soil types covering the prospective area of effluent disposal are the White House-Caralampi-Hathaway association. In general, the soils are deep and have moderate to slow permeability. Some slopes in the area are greater than 5 percent."

7. Page 110, 2nd item - We believe this pertains to groundwater quantity, not quality.

We appreciate the opportunity to comment on this draft EIS.

Thomas G. Rockenbaugh

Thomas G. Rockenbaugh
State Conservationist

Response to comments from the Soil Conservation Service, February 4, 1976

Comments 2, 6 and 7 have been dealt with in the text of the Final EIS.

Comment 1: Page 34, Flood Control -- The Corps of Engineers has a plan for flood control for the Globe-Miami area. There is also an approved application for PL-566 project assistance on Pinal Creek. Neither of these was discussed.

Response: A 1961 Corps of Engineers study recommended 9,000 feet of channelization on Pinal Creek through the City of Globe. This project ends about one mile south of the existing Globe treatment plant site. Thus, the proposed Corps of Engineers project has no effect on any of the alternative projects discussed in this EIS, and these alternative projects have no impact on the Corps of Engineers' plan.

Comment 3: Page 39 -- Suggest a watershed map showing relative locations of population centers within each watershed be used to better display this material.

Response: This information was directly available only as a table.

Comment 4: Page 41, Future Trends -- How are the population projections related to OBERS projections for the area?

Response: The OBERS projections were not utilized since they apply to a three county area (Gila, Maricopa and Yavapai Counties) rather than to the Globe-Miami area. In addition, the OBERS projections rely on the Bureau of Census "series C" population projections, which seem unrealistically high.

Comment 5: Page 54, 2nd paragraph -- Apparently EPA feels Arizona municipalities have the power to purchase land outside city limits for public purchases. We have not found that to be the case in our project activities. We have asked the State Land Department to help us get an attorney general's opinion on this question, and so far, have not received any answer from the Attorney General.

Response: The source of information referenced above is noted in the text (Arizona Office of Economic Planning and Development). The state Attorney General's office has not yet responded to a request for clarification of this issue.

ARIZONA DEPARTMENT OF HEALTH SERVICES

Division of Environmental Health Services

RAUL H. CASTRO, Governor
SUZANNE DANDOY, M.D., M.P.H., Director

March 4, 1976

RECEIVED
REGIONAL HEARING CLERK
MAR 8 1976
REGION IX

U.S. Environmental Protection Agency
Region IX
Attention: Hearing Office (HE 126)
100 California Street
San Francisco, CA 94111

Re: City of Globe - Project No. C-04-0128-01
Draft Environmental Impact Statement
Comments

Gentlemen:

The Arizona Department of Health Services (ADHS) has reviewed the draft Environmental Impact Statement prepared by EPA for the referenced project. Based on that review, this office submits comments concerning the following issues:

1. Phosphate Removal. The draft EIS does not address the possibility of phosphate removal being imposed on discharges to Pinal Creek. The Draft Salt River Basin Water Quality Management Plan report recommends that the total daily phosphate loading in the Salt River below Pinal Creek be maintained at present levels by the application of 80% phosphate removal for treated wastewater effluents that reach the receiving waters. Although the potential phosphate load from treated wastewater is a small fraction of the natural load, reduction of the wastewater load through wasteload allocation among dischargers in the segment may be the most practical way to attain proposed EPA standards. This issue tends to support the recommended project, or no-discharge alternatives.

2. Site Suitability. Regarding the suitability of the recommended project site, there are some important questions left unanswered. Before our office can approve the recommended project concept, additional information and documents indicating land availability, core sample analysis, percolation rate, and topographical characteristics must be submitted. If the recommended general site is not acceptable, major changes in the project will again be required.

3. Treatment Methodology. The ADHS agrees that aerated lagoons represent the most viable treatment method for this project in conjunction with a no-discharge effluent disposal alternative.

Health Building 1740 West Adams Street Phoenix, Arizona 85007

However, we feel that the oxidation ditch is a logical alternative if the no-discharge concept is not feasible at the selected site due to land area constraint or non-conducive soil content or topography. In contrast to statements in the report the oxidation ditch concept has proven ability to achieve the EPA definition of secondary treatment. Although capital and maintenance costs to install and run oxidation ditch plants are probably greater than those costs for aerated lagoons, they are typically less than costs of conventional activated sludge plants.

The narrative on percolation pond disposal should include mention of maintenance procedures that are necessary for effective operation of the ponds. If operation experience at the Corona, California plant is significant in any respects, this should also be included.

4. Regionalization. This is a key issue in this project. Our office feels that regionalization will occur some time in the future as a necessity for future growth in the area. However, due to present economic conditions, it is questionable and unlikely that regionalization will occur in the near future to the degree that the recommended regional plant can be adequately financially supported by local means. Unfortunately, ADHS cannot mandate local entities to participate in the project unless the Gila County Health Department fails to resolve pollution problems and complaints resulting from such problems. These are occurring in a limited county area. ADHS can bring more effective pressure to bear on unincorporated areas by refusing to approve any development in the Pinal Creek drainage basin when developers and landowners submit such plans. However, none have been submitted in the past year.

   The logical lead agency for the regional project is a sanitary district which includes Globe, Miami, and unincorporated county areas in Pinal Creek drainage basin. If this fails to occur and the regional project cannot be supported, Globe and Miami will still be required to upgrade their treatment facilities to comply with NPDES permit limitations and conditions. The ADHS feels that EPA should participate in projects grant fundable to these communities to upgrade their existing facilities until such time as the regional project can be implemented. Perhaps construction of this project can be phased to accomodate the local entities water quality problems in the interim.

   It is the opinion of ADHS that if the Pringle Spring site is proven suitable, the recommended plan is the most cost effective and most acceptable project to serve incorporated areas of Globe and Miami, Cobre Valley Sanitary District, and unincorporated areas in Pinal Creek drainage basin. A modified, or interim project must be developed and included in the final EIS to allow the communities of Globe and Miami to solve their immediate problems as a contingency for delay of regional project implementation.

Sincerely,

James A. Walters

James A. Walters, P.E.
Construction Grants Administrator
Bureau of Water Quality Control

JAW:cp

cc: R. L. Miller, BWQC
S. Von Roberts, CRO
Rick McLoud, EPA - Region IX

Response to comments from the Arizona Department of Health Services, March 4, 1976

Comments 1 and 4 have been addressed in the text of the Final EIS.

Comment 2: Site Suitability -- Regarding the suitability of the recommended project site, there are some important questions left unanswered. Before our office can approve the recommended project concept, additional information and documents indicating land availability, core sample analysis, percolation rate, and topographical characteristics must be submitted. If the recommended general site is not acceptable, major changes in the project will again be required.

Response: The EIS is not intended to take the place of a detailed facilities plan. The information requested should be a part of such a document. Preliminary percolation test data and flood hazard evaluations are presented in the Final EIS.

Coment 3: Treatment Methodology -- The ADHS agrees that aerated lagoons represent the most viable treatment method for this project in conjunction with a no-discharge effluent disposal alternative.

However, we feel that the oxidation ditch is a logical alternative if the no-discharge concept is not feasible at the selected site due to land area constraint or non-conducive soil content or topography. In contrast to statements in the report the oxidation ditch concept has proven ability to achieve the EPA definition of secondary treatment. Although capital and maintenance costs to install and run oxidation ditch plants are probably greater than those costs for aerated lagoons, they are typically less than costs of conventional activated sludge plants.

The narrative on percolation pond disposal should include mention of maintenance procedures that are necessary for effective operation of the ponds. If operation experience at the Corona, California plant is significant in any respects, this should also be included.

Response: Costs for achieving 80 percent phosphate removal preclude consideration of direct discharge of treated effluent to Pinal Creek as long as other means of effluent disposal are available. The concern of the copper companies over the quality of any treated wastewater which they might accept was an additional factor leading to evaluation of the activated sludge process rather than the oxidation ditch. No attempt was made to evaluate all conceivable treatment processes which might be utilized.

CITY OF GLOBE

150 NORTH PINE — GLOBE, ARIZONA 85501

REGION IX COMM. CENTER
FEB 13 10 54 AM '76

February 11, 1976

United States Environmental Protection Agency
Region IX
100 California Street
San Francisco, California 94111

ATTENTION: Rick McCloud and George Teramoto

RE: Draft Environmental Impact Statement Greater Globe-Miami, Arizona Wastewater Treatment Project January, 1976

Dear Rick and George:

This letter will follow up on some of my verbal statements when you were here in Globe, Tuesday. I want to reiterate that my comments are meant to be constructive, not caustic.

I call your attention to the following in the draft:

Page 2 first complete paragraph: "The existing Cities Service Company Plant (Cobre Valley Sanitary District)" should read "The existing City of Globe Plant (serving a part of the Cobre Valley Sanitary District.)

Page 5 Local Agencies, City of Globe: "Attention: Mayor G. H. Williams."

Page 6 Legislators: "Honorable Raul Castro."

Page 15 first full paragraph --- type or location: "but with the condition that no new services could be added."

Page 16 Climate, characterized by "warm" summers - also: Night-time thermal inversions are "uncommon."

The entire reference to Air Quality should be rewritten in view of the improved smelter situation.

Page 17, Wildlife, I believe Globe and Miami are in the "Chaparral Area," not the lower Sonoran Desert.

Figure 6 should be updated to picture the existing smelter condition.

Page 29 lists no standard, but later pages indicate there are standards.

Page 30, Ground Water, second paragraph, our hydrologists tell us just the opposite. Third paragraph, would the same thing happen to our percolated effluent? Fourth paragraph refers to thirty year old data.

Page 31, first and second paragraphs seem to conflict with comment on page 29.

Page 33, second paragraph, the Cutter Well pumps are used at least two shifts per day and our wells are "capable of" producing 4.32 (mgd). Last parentheses, I know that the Arizona Water Company's consumption records are accurate.

Page 34, first and second full paragraphs, it is common knowledge locally that Arizona Water Company has serious problems as to both quantity and quality. On Reclamation and Reuse, Alternate Three would bypass one of Inspirations Well locations - The Fodera pumps.

Page 55, second paragraph, the use of the word "concept" seems awkward. Last phrase is overly optomistic.

Page 57, at the end of the first full paragraph,"however it does propose a limit on phosphates."

Page 62, I am told that Oxidation Ditches have been used extensively in Europe.

Page 65, next to last sentence, Dr. Charles Bejarano made quite a point that chlorination does not kill all viruses.

Page 69, percolation pond disposal - I have serious doubts about the 4 feet per week rate of percolation/evaporation.

Page 72, direct discharge, first paragraph last phrase, would apply to the failure of any type treatment plant. Second paragraph should be "the existing City of Globe plant (serving a part of Cobre Valley Sanitary District)."

Page 73, site 1, end of second paragraph, "The City of Globe did propose living quarters on the site to alleviate this problem.

Figure 19 should be updated to show that the weeds, cattails and tules have been removed.

Page 77, Site 3, fourth paragraph, first sentence, it appears that what can be calculated for one location could be calculated for another in the same drainage area.

Page 78, last paragraph, since land is not reimbursable by EPA is it added to the local costs. We have reason to doubt that it has.

Page 81, City of Globe, present measured discharge is from one-half to three quarter million gallons per day through a calibrated weir. Spetic tank wastes are no longer being dumped into the ponds. The ponds are no longer overgrown with cattails and tules.

Page 83, No. 2, owner, City of Globe.

Figures 24 thru 31, the term "exact location to be determined" leaves a lot to be desired since location was one of the primary reasons we are having an EIS.

Page 90, Alternative 2-A, second paragraph, where are we going to get 25 acres in the vicinity of our existing plant that is not in a flood plain?

Page 94, third line, should read "The existing City of Globe plant (serving a portion of Cobre Valley Sanitary District." Same paragraph, we are not convinced the flow would be entirely by gravity to the site shown in figure 21. Next paragraph, location is section "6." Second full paragraph, are land and possible pumping costs included in the $3,465,200.

Page 115 How are these impacts weighed?

Pages 118 thru 122 are unintelligable at least to me.

Page 123, I would like to see some backup for these computations.

Page 131, in my opinion Alternative 3 could have tremendous social and monetary impacts if full cooperation between governments is not achieved.

Page 132, same comment as for page 115.

Page 133, last paragraph, only if it works.

Page 140, should have a definition of SECONDARY TREATMENT.

Page 145, Roberts, Mary, City Clerk, City of "Globe".

Personal regards,

Lionel Blair

Lionel Blair
City Manager

LB:mm

Response to comments from City of Globe, February 11, 1976

Comments relating to pages 2, 5, 6, 15 (sic page 14), 16, 17 (sic page 21), 29, 30, 31, 33, 57, 62, 65, 69, 72, 73, 78, 81, 83, 90, 94, 118-122, 123, 131, 140 and 145 have been dealt with in the text of the Final EIS.

Comment: Figure 6 should be updated to picture the existing smelter condition.

Response: No other photograph is readily available.

Comment: Page 62 -- I am told that oxidation ditches have been used extensively in Europe.

Response: Refer to the response to a similar comment from the Arizona Department of Health Services.

Comment: Figure 19 should be updated to show that the weeds, cattails and tules have been removed.

Response: No more recent photograph is readily available.

Comment: Figures 24 through 31 -- The term "exact location to be determined" leaves a lot to be desired since location was one of the primary reasons we are having an EIS.

Response: Precise site boundaries were never discussed with the Inspiration Consolidated Copper Company. The intent of Site 3 was to establish a location north of the Wheatfields area where there would be minimal conflict with adjacent land uses.

Comment: Pages 115 and 132 -- How are these impacts weighed?

Response: No weighting factors were used.

76-80-0005
Project Application Number

Feb 9 1976
Date

To whom it may concern:

I have investigated the archaeological aspects of the attached application for a federal grant or assistance with the following results:

✓ The ASU site files indicate no known archaeological sites on the property in question or surrounding property for a distance of one (1) mile.

___ The ASU site files indicate no known archaeological sites on the property in question but do document archaeological sites on adjacent property and the probability is high that sites also occur on the property in question.

___ The ASU site files include the following archaeological sites on the property in question:

The following sites on the property qualify for or have been nominated to the National Register of Historic Places:

___ The property in question should be examined by a professional archaeologist since the area has not been previously examined or has not been examined in sufficient detail.

The following institutions should also be consulted regarding this application:

✓ Arizona State Museum, Tucson.
✓ Museum of Northern Arizona, Flagstaff.
___ Pueblo Grande Museum, Phoenix.
___ ________________________.

Additional Comments:
This use of a private company to perform archaeological work sh[ould] only be acceptable if that Company has demonstrated competence in the area ~~of~~ in which the survey is to be conducted.
I would like some indication of the archaeologist's background and affiliation. I also noted that none of the Arizona institutions (A.S.U., U. of Az., or Mus. of N. Az.) were contacted. Merely checking with State Hist. Preservation Offices is not sufficient investigation.

Donald E. Weaver, Jr.
Donald E. Weaver, Jr.
Contract Archaeologist
Department of Anthropology
Arizona State University
Telephone: 965-7174

It is not clear from the report whether the lands surveyed are in Tonto Nat'l Forest or in private ownership. If national forest lands are involved then a valid Forest Service Permit is required for archaeological work. No such permit is mentioned in the report.

In general I found much of the report poorly reproduced in many cases it was impossible to evaluate the work becau the maps were unintelligible.

ANN S. PEAK & ASSOCIATES

CONSULTING ARCHEOLOGY

April 1, 1976

TO: Jones & Stokes Associates
455 Capitol Mall, Suite 835
Sacramento, California

SUBJECT: Response to comments on Greater Globe-Miami Wastewater Treatment Project by Donald E. Weaver, Jr., Contract Archeologist, Department of Anthropology, Arizona State University

In response to the comments of February 9, 1976, we wish to assure all concerned that the investigator is a Southwestern Archeologist with extensive survey and excavation experience in that culture area. Our resumés and experience are available on request should anyone care to pursue the issue.

The firm was informed that no federal lands were involved within the scope of the present investigations. We are well aware of the necessity for obtaining Federal Antiquity Act Permits as we have held eight for excavation and survey on federal lands. We have held and do hold several federal contracts and adhere to all regulations.

The State Historic Preservation Office is, under the law, the central steward of extant cultural resources within each state. If the records and files are incomplete and dispersed among many institutions, this situation effectively blocks proper and required review by other archeologists. It would benefit the profession if the records were centralized as soon as possible.

Sincerely,

Ann S. Peak, President

Tony F. Weber, Vice-President

AP:CL

Copy to:
Donald Weaver
Interagencies Archeological Services,
National Park Service, San Francisco

8332 WILLOWDALE WAY - FAIR OAKS - CALIFORNIA - 95628 - (916) 967-3684

ARIZONA STATE
UNIVERSITY TEMPE, ARIZONA 85281
DEPARTMENT OF ANTHROPOLOGY

Comment on Greater Globe-Miami
Wastewater Project EIS

The cultural resource study presented in Appendix C, upon which is based significant evaluations of the environmental impact of the proposed project, is inadequate.

A. The work is inadequate because it is incomplete. The complete route of the interceptor facilities was not surveyed, inclusive of survey of the routes of existing interceptors projected for enlargement. Since the federal project will establish wastewater facilities that will accomodate a larger population, impact of the project will also be felt on cultural resources through expansions of existing residential and industrial areas. Such expansion districts were not included in the cultural resources survey.

B. The work is inadequate because it was not accomplished to the level of obvious professional standards. This is apparant in at least two regards. First, the check of records of previously identified sites was incompetant. It is well known to professional archaeologists that Arizona contains a great many Hohokam and Salado ruins which were surveyed between 1920 and 1950 by a now defunct research organization which was located at Globe (Gila Pueblo). Those records, now housed at Arizona State Museum, were not checked by these investigators. Nor were the survey files of the other institutions in the state checked. The investigators assumed that the files of the State Historic Preservation Officer would provide adequate data since this is the type of records check which is legally required. Their investigatory procedure was legal, but it was incompetant and unprofessional. Second, the foot survey and spot check study was not accomplished professionally as it ignored legal requirements for archaeological investigation. Under the Federal Antiquities Law of 1906, and under Arizona law governing State-owned or -managed properties, permits are required for archaeological survey which studies or traverses Federal or State lands. Forest Service lands were directly studied (or should have been for professionally complete study) in sec. 29 of T2N, R15E and both Federal and State permits should have been sought by Ann S. Peak and Associates. Their failure to do so documents lack of professional competance.

James Schoenwetter

James Schoenwetter
Associate Professor

ANN S. PEAK & ASSOCIATES
CONSULTING ARCHEOLOGY

April 1, 1976

TO: Jones & Stokes Associates
455 Capitol Mall, Suite 835
Sacramento, California

SUBJECT: Response to comments on the Greater Globe-Miami Wastewater Treatment Project by James Schoenwetter, Associate Professor, Arizona State University, Tempe, Arizona 85281

Our response to Professor James Schoenwetter's comments on the archeological investigations will be to the individual sections of his letter of February 13, 1976.

We must take exception to his unprofessional comments on our alleged incompetency and unprofessional approach. Such comments are unwarranted in view of the limited data Professor Schoenwetter attempted to gather on our expertise and experience.

Section A. The work is complete within the present scope of the established alternatives and alignments. The report spoke to the necessity of further intensive survey when the selection of interceptor routes is finalized.

To arbitrarily suggest that all potential growth of residential areas be surveyed now is an unrealistic attitude. No archeologist can assume the job of a planner/economist and infallibly assess the direction of growth. Legitimately, only the jurisdictional bodies have the right to require additional surveys of land use change parcels.

Section B. Record research was done through the State Historic Preservation Office. If its files are presently inadequate, the responsibility for the correction of this dispersal of valuable records should be of the utmost concern to the participating agencies within the State of Arizona. It seems more cost-effective to direct survey funds to the immediate problem area than to also conduct a statewide investigation of scattered records.

8332 WIL LOWDALE WAY - FAIR OAKS - CALIFORNIA - 95628 - (916) 967-3684

Although records were not reviewed at Arizona State Museum, it would appear that the investigation was sufficient as no sites had been previously recorded within the survey area (see Weaver's letter, 1976, this E.I.S.). Apparently the Arizona State Historic Preservation Office records were correct.

In regard to the possibility of trespass on federal lands, the investigators were assured that all survey lands (in the present scope) were in either private or local agency holdings. As the Principals of the firm have held eight Federal Antiquity Permits for survey and excavation on both Forest Service and Bureau of Land Management lands, their judicious regard for close adherence to the 1906 Antiquities Act should be reviewed before comments are formulated.

It may be that the comments from Schoenwetter are not directed to the competency of the investigation by our firm, but instead reflect a more subtle bias.

Sincerely,

Ann S. Peak

Ann S. Peak, President

Tony F. Weber

Tony F. Weber,
Vice-President

AP:CL

Copy to:
James Schoenwetter
Interagencies Archeological Services,
National Park Service, San Francisco

Comments on Greater Globe-Miami
Wastewater Project EIS

The portion of this EIS dealing with the herpetofauna is for all practical purposes inadequate. Based on the demonstrated lack of ability to utilize available resources on distributions and habitats of this important animal group, it is likely that other faunal lists included in this statement may be inadequate.

Two major types of errors are evident:

First, the list of reptile species is incorrect, neglecting even some of the most common species in the locality. The authors cite Stebbins, 1966 as their source of data on reptiles yet the list is incomplete. In addition, amphibians have been entirely left out, even though several species are very abundant!!

Second, the authors have made statements related to the ecology of reptiles that are incorrect and have made several statements which are later negated by other statements. For example, on page 21, it is stated that most reptiles feed on insects, mammals and small birds. In fact, many desert reptiles feed on other reptiles!! Also, it is stated that they are active only during warm months. In fact, Uta stansburiana is active year round and even reproduces as early as February. On page 21 it is stated that the reptiles are adapted for the desert habitat. If true, then how can the same author state on page 114 that added water will increase productivity of reptiles? If these are desert adapted, changing the habitat to a more mesic one should adversly effect the so called desert adapted species. It also seems highly probably that added water would attract cattle, resulting in additional habitat deterioration.

I have only listed several of the errors and inconsistencies which I ran across in this statement. However, the severity of the errors in regard to the herpetofauna suggests that this study was compiled by personnel with little or no biological background or ability to retrieve or assimilate literature material. The important data, e.g., densities, reproductive information and population data, are entirely absent in this report and on the basis of data included, I cannot believe that an accurate assessment of the impact of this project can be made.

Laurie J. Vitt
Graduate Associate
Office of Research Grants
and Contracts
ASU, Tempe, AZ 85281

LJV:ah

Response to comments from ASU Office of Research Grants and Contracts, March 4, 1976

Various portions of the text of the Final EIS have been revised in response to the above comments. Due to the limited acreage involved in any of the project alternatives, the amount of similar habitat present in the area, and the absence of any documented or readily observable unique biological features in the area, it was considered unnecessary to perform detailed field studies of the biological resources present on the alternative sites. Instead, a general overview of biological conditions was presented. No attempt was made to provide a complete inventory of either the flora or fauna of the area.

The impact discussion on page 114 of the Draft EIS relates to the effects of increased flows in Pinal Creek, not to spray irrigation with treated effluent. Increased flows in the creek will enhance riparian vegetative growth and may increase local insect populations. These factors would improve habitat conditions for several reptile species (directly or indirectly).

David E. Creighton, Jr. P.E.
P.O. Box 1548
Phoenix, Arizona 85001

March 1, 1976

Regional Administrator
Region IX
Environmental Protection Agency
100 California Street
San Francisco, California 94111

Dear Sir:

Your Draft Environmental Statement for the Greater Globe-Miami Wastewater Treatment Project, EPA-9-AZ-GILA-Globe-Regional WWTP-76, has been reviewed.

My comments on the environmentally inadequate but engineeringly acceptable draft statement are enclosed.

Please include my comments in the record prepared for your Final Environmental Impact Statement and furnish me a copy. Thank you.

Sincerely,

David E. Creighton, Jr. P.E.

Enclosure

Comments on Environmental Protection AGency DES
Glove-Miami Sewage Treatment Plant

1. Page 1, par. 2, sentence 2. How can environmental social and cost imapcts be promulgated? Clarify. Promulgate is a legalistic process.

2. Page 9, par. 4 . The listing of references in the Bibliography shows the out-of-day character and inadequacy of most of the biological information and descriptions; particularly the employment of C. H. Merriam 1890 (pg 142) as the basic reference.

3. Page 12, par. 4, sentence 3. The candor of the agency to admit an error of staff and executive judgment is appreciated. It points up the accuracy of a suspicion that the agency does not have the competence that CEQ edicts have proclaimed it to have.

4. Page 14, par. 2. The identification of a contractor as having prepared the EIS does not absolve the agency of the responsibility for adequacy and accuracy. Also, this oblique reference to Notice of Intent does not state whether this complies with CEQ guidelines for using OMB A-95 Clearinghouse procedures. The responses to the Clearinghouse A-95 procedure should be part of the record.

5. Page 15, par 1, last sentence. The area is definitely not a part of the lower Sonoran Desert Physiographic Province. The error of relying upon outdated nomenclature leads to cumulative questions regarding the overall competence of the EIS.

6. Page 15, par 4. line 1. Tucson is misspelled.

7. Page 4, par. 4. The "no recently recorded earthquake" should be supported by a date.

8. Page 20, par. 6, and page 21. The reliance upon Merriam has lead to the inaccurate Vegetation classification on page 21 of Appendix A of paloverde-sahuaro community. In Appendix A - the listing of 17 species by common name and excluding creosotebush - (Larrea divaricata), one of the most prominent species, indicates a lack of professional competence and review. The further occurence of seven errors in scientific names or spelling is inexcusable for a 17-item list. The inclusion of sahuaro, ironwood, ocotillo, blue-paloverde, and misspelling of "bajadas" as "bajados" indicates that the consultant and agency should have been required to make an "on the ground inspection" of the project area at the time the contract EIS work was initiated. These errors further clarify the peculiar and often times ignorant comments that originate from the Agency Regional office when commenting on statements concerning Arizona projects. The consultants and the agency personnel "do not know the territory."

9. Page 21, par. 8. The accuracy of perennial status given to Pinal Creek for the Pringle Ranch to Salt River for this full reach should be determined from field inspection not remote mahogony desk flights. Are the fish species identified from sampling. Particularly in light of page 27, par. 6, 1st sentence.

10. Page 22, par. 2. Most biologists capitalize Gambel's quail.

11. Page 22, pars. 3 and 4, and table 4. With highly unlikely species included and referred to, why is no mention made of the spotted bat, Euderma maculata, or the southern bald eagle, Haliaetus leucocephalus.

12. Page 24-27, Archeology and History, and Appendix 5. This material in general is atrocious and inaccurate. The following is a general listing of the deficiencies. The lack of recognition of Yavapai presence, the placing of Euro-Americans in a farming and ranching presence prior to 1850, the racist reference to the Bloody Tanks Massacre, the placing of Pimas and Papagos in eastern Arizona, the confusion of Phoenix in contextual sense, the assigning of Hohokam and Salado flatly to separate areas when their sites occur side by side or stratified, the extensive irrigation of "wild mesquite beans" by the Hohokam, the again racist classifying of the Apache as "sullen", the lack of reference to the National Register of Historic Places, the misidentification of the office of State Historic Preservation Officer, the avoidance of any contact with the Anthropology Departments at University of Arizona, Arizona State University. Northern Arizona University, Prescott College, or Southern Illinois University, or the Arizona Archeological Center, (NPS), and the pitifully inadequate references including the Mescalero Indians of east-central New Mexico, and misidentification of Dr. Gummerman.

13. Page 27, par. 6, and top of page 28. This paragraph appears to be internally conflicting.

14. Page 27, par. 5, 1st sentence. "The project lies in . . . and is part of the Salt River Project." needs to be clarified. The author apparently misinterpreted the information obtained from the Miller report. The EPA fund supported project for Globe-Miami is not part of the Reclamation Act initiated Salt River Project.

15. Page 33, last 2 lines. This obviously biased statement should be avoided by a logical analysis and explanation in relation to "per customer" as a customer in a household of several persons indicates lack of professional analysis. On an assumed four persons per household (customer) a use of 69 gpcpd appears low.

16. Page 49, par. 5. "as a tesult of earth movement" should be clarified to remove the possible inference of seismic activity of major extent.

17. Page 56. The rationale for presenting institutional constraints to obfuscate not presenting an alternative that would require some legislative changes is not persuasive of any validity in the agency's "full disclosure" sainthood look of "intent." Rather it appears to be an attempt to justify a bureaucratic position under the guise of a "legalistic" approach and ignoring of CEQ guidelines. Any of the cloaking authority references and dates may be changed by legislative action even though beyond the agency's authority. It would appear that following the discussion of implementation options on pages 78-80, the nonimplementation option of Alternative 0 be reported as Alternative OR (for no action - repeal of legislation or ignoring the constraints with no penalty imposed).

18. In general, the professional engineering studies of alternatives appear to have been reasonably extracted and reported by the writers of the EIS. This, however, does not compensate for, or produce an overall acceptable "full disclosure" document.

19. Pg. 116, par. 3. Is not the identification of the invertegrate dragon fly as a crustacean a bit unusual.

20. Page 118, par. 2. It appears that recognition of the potential contribution or interference to water rights or pollution of the Salt River Project have not been considered.

21. In conclusion, it is suggested that you grade your Draft EIS by classifying it EU - Environmentally Unsatisfactory.

Response to comments from Mr. Creighton, March 1, 1976

Comments number 1, 4, 6, 7, 8, 10, 11, 13, 14, 15, 16, 17, 19 and 20 have been dealt with in the text of the Final EIS. Comments essentially identical to numbers 2, 5 and 12 were dealt with in regards to the letter of comment from the Department of the Interior.

Comment 9: Page 21, par. 8 -- The accuracy of perennial status given to Pinal Creek for the Pringle Ranch to Salt River for this full reach should be determined from field inspection not remote mahogany desk flights. Are the fish species identified from sampling. Particularly in light of page 27, par. 6, 1st sentence.

Response: Ms. Setka, a resident of the Wheatfields area, has reported that Pinal Creek is essentially perennial as it flows by her property (Appendix S). As noted on page 29 of the Draft EIS, Mr. Leffert of the U. S. Forest Service, Peterson (1962), and the Arizona Department of Health Services concur in the designation of the lower stretch of Pinal Creek as perennial.

STEPHEN L. BIXBY
~~425-2382~~
602-425-1426

BIXBY RANCH
REGISTERED HEREFORD CATTLE
P. O. Box 311
GLOBE, ARIZONA 85501

STEPHEN L. BIXBY JR.
~~425-2944~~
602-425-1233

December 10, 1975

RECEIVED
DEC 12 1975
DON OWEN & ASSOCIATES

Dr. Robert Gumerman
Don Owen & Associates
2232 Southeast Bristol, Suite 206
Santa Ana, California 92707

Dear Dr. Gumerman:

After study of the "Summary of Construction and 20-year operation costs" pertaining to the seven alternatives of the Globe, Arizona, EPA sewer project No 040128, I still have some questions which I will appreciate having answered.

1. What will be the total local costs of each alternative?

2. What are the principles of cost distribution between locals?

3. What are your estimates of costs to Wheatfields and other local areas to participate?

4. What will be the estimated annual operating costs of each of the seven alternatives?

I hope you will be able to answer these questions for me without doing a lot of extra work.

As you know I am very concerned, along with my Wheatfields neighbors, with the effects of these seven sewer alternatives. Alternative 3 should solve our problems and all the other regional problems, if the Regional Areated Lagoons are located far enough north, beyond the Setka Ranch, to not create a nuisance to residents of that location.

We really appreciate the objective attitude you and your associates have shown in gathering the environmental and economic facts in on-the-ground examination and your study and discussion of these sewer problems.

Sincerely,

Stephen L. Bixby

Stephen L. Bixby

RESPONSE TO LETTER FROM BIXBY - 10 DECEMBER 1975**

RESPONSE TO QUESTION 1.

The EPA will fund 75% of the eligible cost of pumping stations, interceptors, treatment facilities, and outfalls. The remaining 25% of the cost of these facilities is a local cost. Any expansion or modification of these facilities, after the initial construction, is a 100% local cost. The annual operating cost of these facilities is a 100% local cost.

The cost of local collection sewers and trunk sewers is 100% a local cost.

Assuming that the EPA determines all grant fundable facilities to be 100% eligible, the breakdown between initial local share costs and EPA funded costs (assuming all collection systems are built initially) is as follows:

SUMMARY OF INITIAL LOCAL SHARE COSTS

ALTERNATIVE	PUMPING STATIONS, INTERCEPTOR, TREATMENT & OUTFALLS TOTAL 1976 COST	EPA FUNDED COST	LOCAL SHARE COST	LOCAL COLLECTION AND TRUNK SEWER COST*	SUM OF INITIAL COST*
1A	7,810,600	5,858,000	1,952,600	6,211,000	8,163,600
1B	7,445,600	5,584,200	1,861,400	6,211,000	8,072,400
1C	6,984,900	5,238,700	1,746,200	6,211,000	7,957,200
2A	4,053,200	3,039,900	1,013,300	6,211,00	7,224,300
2B	4,515,500	3,386,600	1,128,900	6,211,000	7,339,900
3	5,324,600	3,993,500	1,331,100	6,211,000	7,542,100
4	9,047,700	6,785,800	2,261,900	6,211,000	8,472,900
5	4,303,900	3,227,900	1,076,000	6,211,000	7,287,000

* Note - Does not include cost of collection and trunk sewers in Wheatfields.

** By Don Owen & Associates.

RESPONSE TO QUESTION 2.

The principal of allocating local share costs must be developed and approved at the local level, and submitted to EPA in a Revenue and Repayment Program. Before a grant can be awarded, EPA would have to approv- this Program as being "fair and equitable", a provision which means that all residents would pay for services in a manner directly attributable and proportional to the cost of these services. Further discussion of project financing is presented on pages 78-80 of this Statement.

RESPONSE TO QUESTION 3.

The cost of collection sewers and trunk sewers in Wheatfields has not been determined, and allocation of the local share cost of remaining facilities cannot be done at present, as discussed above. Therefore, no estimate can be made of the cost to Wheatfields.

RESPONSE TO QUESTION 4.

The annual costs increase through the years, as flow increases. The following table shows the annual costs for each alternative over a 20-year period.

ANNUAL COSTS - $/YEAR

ALTERNATIVE	BETWEEN 1976-81	BETWEEN 1981-86	BETWEEN 1986-91	BETWEEN 1991-96
1A	159,300	173,800	198,300	208,100
1B	160,200	174,800	199,400	209,500
1C	139,800	152,900	174,900	184,000
2A	52,300	60,700	67,200	74,400
2B	60,100	70,300	77,400	85,100
3	43,600	47,400	51,100	53,900
4	205,300	230,300	252,300	265,400
5	55,400	62,200	67,700	73,200

COMMENTS RELAYED TO ME FROM STEVE BIXBY ON 2 FEBRUARY 1976.

PAGE 77 - Under Site 3 - omit "along Horseshoe Bend Wash"

Change Sika to Caretto

Change 20 acres to 33 acres

PAGE 92 - Next to last line, change section 26 to Section 6

PAGE 94 - Same comment as p. 92

PAGE 138 - Add "not" on the sixth line

The following letters are either self-explanatory or for which all response has been made through changes in the text of the Final EIS.

Inspiration Consolidated Copper Company

INSPIRATION, ARIZONA 85537

RECEIVED
REGIONAL HEARING CLERK
MAR 8 1976
REGION IX

March 5, 1976

U.S. E.P.A.
Attn. Hearing Office
H.E. - 126
100 California Street
San Francisco, California 94111

Gentleman:

This letter is written in objection to your proposal for the construction of the new Globe Sewage Disposal Plant. It is our understanding that you are recommending alternate three as outlined in your Draft Environmental Impact Statement. You describe alternative three as "A regional aerated lagoon treatment plant located near Pringle Springs with disposal to percolation ponds."

Our objections to the proposal are specifically outlined as follows:

I. Deterioration of Pringle Area water supply.

We have recently had to install a chlorination system on our fresh water due to new coliform bacteria contamination of the Pringle water basin. This contamination probably comes from the trailers in the Wheatfields area which is located 3 miles upstream from Pringle water basin.

Inspiration is currently chlorinating this water in order to maintain a quality of water suitable for human consumption. Locating the sewage treatment plant at Pringle would completely contaminate the Pringle water basin to such an extent that we would be unable to use it as drinking water.

The other detrimental aspect of this type of discharge system would be the contamination of the Pringle ground water with various types or organic contaminants contributed by detergents and organic waste material. Since much of our processing is dependent upon the adequate and controlled chemistry within our system, the accumulation of these contaminants, would ultimately result in metallurgical havoc. This plays an important fact since the Pringle water source is split into fresh water and industrial water use. The injection of the sewage effluent into the ground water system near Pringle would definitely affect Inspiration's operation within a short period of time.

Under no circumstances should this material be discharged directly into the ground water to contaminate the ground water system and then returned at random where we would have no control over the treatment or the quality of the water. If we should choose to take a portion of the sewage water effluent, this should be at our option. The section as described in Page 86 of the Environmental Impact Statement that all the water must be taken on a contractual basis at all times is prohibitive for our consideration.

The results of flotation tests using sewage water, show that even well run sewage treatment plant effluents will adversely affect flotation. This indicates that further treatment will be required from even the best treatment plants in order for it to be used in a metallurgical process.

If Inspiration should have to curtail it's mining and milling operations because of a lack of industrial quality water it would result in the loss of over 1000 jobs. This curtailment of employment would have a profound economic impact on the community.

II. Impact on Property Value, Pringle Area.

Inspiration is one of the property owners in the immediate area of the plant having full or majority interest in 557 acres.

This land along with adjoining land under various ownerships is prime residential property that can be developed in the future. The impact on the property values in the area has never been discussed with the owners yet on page 134 of your draft environmental statement you state in part.

A. Construction on use of the area will change the land form and cause soil erosion.

B. The percolation of treated waste water into the groundwater may cause bacteria, viruses and parasites to enter the ground water.

C. Nuisance insects, mosquites and midget flies will grow in the treatment ponds and may fly to residential areas.

This area is one of the few in the Globe-Miami area available for medium income residential development. Construction of a plant of the type you recommend would effectively exclude the area for such use.

In view of the above we strongly object to construction of a sewage plant of the type you recommend in the Pringle area.

Sincerely,

R. R. Hyde

R. R. Hyde
President

RRH:sk

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

[illegible]

12 February 197[illegible]

U.S. Environmental Protection Agency
Attn: Hearing Officer, [illegible] 125
Region IX
100 California Street
San Francisco, CA 94111

Gentlemen:

This is in response to a Notice of Public Hearing, dated January 7, 197[illegible], from your office which invited comments concerning the draft environmental impact statement for the Greater Globe-Miami, Arizona Wastewater Treatment Project.

The proposed project does not conflict with existing or authorized projects of the Corps of Engineers. We have no comments regarding environmental impacts of the proposed plan.

According to the guidelines of the U.S. Water Resources Council, a sewerage facility should be protected from a Standard Project Flood. Reference to the flood hazard boundary map for the city of Miami, prepared by the Flood Insurance Administration (FIA), U.S. Department of Housing and Urban Development, indicates that the areas along both sides of Live Oak Street are subject to flooding during a 100-year flood on Bloody Tanks Wash. Similarly, the map for the city of Globe indicates that the areas adjacent to the Southern Pacific railroad tracks are subject to flooding during a 100-year frequency flood on Pinal Creek. Accordingly, we feel that the problem of flood protection for the proposed sewerage system should be thoroughly addressed in the impact statement.

The maps cited above, Community Nos. 04002[illegible] and 04003[illegible] for Globe and Miami, respectively, can be obtained from FIA.

SPLED-E 12 February 1976
U.S. Environmental Protection Agency

If we can be of further assistance, please feel free to contact Mr. Robert L. Hall, Chief, Flood Plain Management Section, telephone (213) 688-5420.

Thank you for the opportunity to review and comment on this draft statement.

Sincerely yours,

GARTH A. FUQUAY
Chief, Engineering Division

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
REGIONAL OFFICE
50 FULTON STREET
SAN FRANCISCO, CALIFORNIA 94102

OFFICE OF
THE REGIONAL DIRECTOR

Office of Environmental Affairs

February 27, 1976

U.S. Environmental Protection Agency
ATTN: Hearing Office, HE-126
Region IX
100 California Street
San Francisco, California 94111

Dear Sir:

The Draft Environmental Impact Statement for the Greater Globe-Miami, Arizona Wastewater Treatment Project has been reviewed in accordance with the interim procedures of the Department of Health, Education and Welfare as required by Section 102(2)(c) of the National Environmental Policy Act, PL 91-190.

We note that the project may be growth inducing. It is recommended that the development of the Final Environmental Impact Statement address the potential increased level of educational services and medical facilities that will be required by an increase in population. The Statement should include assurances that the State and/or local governmental units are aware of the potential increases and are planning to meet them.

Sincerely,

James D. Knochenhauer
Regional Environmental Officer

cc: CEQ
OS/OEA

ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

206 South Seventeenth Avenue Phoenix, Arizona 85007

RAUL H. CASTRO
Governor

WILLIAM A. ORDWAY
Director

WILLIAM N. PRI
State Engineer

February 25, 1976

Mr. Ralph C. Kingery
Arizona State Clearinghouse
Office of Economic Planning
and Development
1624 West Adams, Room 300
Phoenix, Arizona 85007

Re: Greater Globe - Miami, Arizona
Wastewater Treatment Project
EPA-9-AZ-Gila-Globe-Regional
WWTP-76-Draft Environmental Impact
Statement
State Identifier - 76-80-0005

Dear Mr. Kingery:

The Environmental Planning Services of the Highways Division, Arizona Department of Transportation, has reviewed the above referenced Draft Environmental Impact Statement submitted by the U.S. Environmental Protection Agency.

The proposal, as written, should not present any significant adverse impacts upon Arizona Department of Transportation Highway interests. It will be necessary, however, for the Environmental Protection Agency to maintain coordination with the Arizona Department of Transportation in regard to adapting the sewer plan to the highway system encompassing U.S. 80 and 70, U.S. 66 and 70 and S.R. 88, all located in the wastewater treatment project area. We note the various alternatives all involve pipes under the highways but some of these are presently in place. New ones will require new right of way agreements.

The Arizona Department of Transportation has one highway construction project scheduled in the current five-year transportation construction program which could have some involvement with the study area. It is as follows:

Project Number: F-022-3-531
Phoenix - Globe Highway (U.S. 60 and S.R. 60T)
(Willow Street - Hill Street (Globe)
Length: .65 mile starting at Milepost 250.5
Type of Work: Construct a 68' roadway with grade, drain and asphaltic concrete pavement. It will provide a safer route by constructing a highway connection on U.S. Highway 60 in the

City of Globe beginning at Willow Street and Oak Street on the north and terminating at Ash Fork and Hill Street on the east. This will be mostly on new right of way as shown by the sweeping curve on the map portion of the attached copy of a Public Notice published on April 17, 1975.
Schedule: Construction projected for FY 1975-1976.

Coordination for this wastewater treatment project should be maintained with Mr. H.M. Osmus, District Engineer, Arizona Department of Transportation, District VII, Drawer A.D., Miami, Arizona 85539, telephone number: 261-7871.

We note the EIS finds Alternative 3 to be preferred over the other alternatives. The fact that the proposed location for the aerated lagoon treatment and percolation pond disposal in lower Pinal Creek is away from frequently traveled roads, is certainly a favorable point in aesthetic consideration.

We appreciate the opportunity to review and comment on this draft Environmental impact statement.

Yours very truly,

WM. N. PRICE
State Engineer

Mason J. Toles

MASON J. TOLES, Manager
Environmental Planning Services

MJT:ADG:kmc

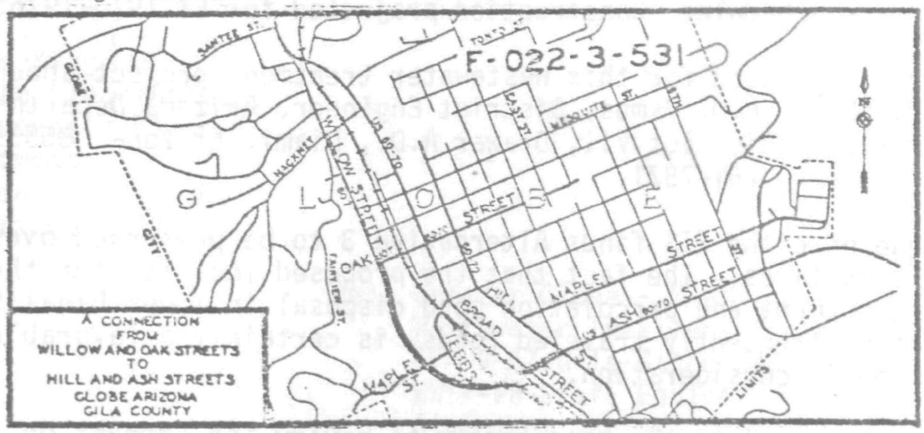
Attachment

cc: ADOT - District VII
Mr. Paul DeFalco, Jr.

ARIZONA DEPARTMENT OF TRANSPORTATION

PUBLIC NOTICE

The Arizona Department of Transportation proposes to construct a highway connection on U. S. Highway 60 in the City of Globe, beginning at Willow Street and Oak Street on the north and terminating at Ash Street and Hill Street on the east, a distance of approximately .65 miles.



The Arizona Department of Transportation conducted a Corridor Public Hearing in the City of Globe on April 28, 1971. At that time the State presented for consideration two corridor locations of the proposed highway connection. The State, after due consideration of the comments received during and subsequent to the Corridor Public Hearing and the additional factors that must be considered in highway design, selected an alignment.

The selected alignment crosses Pinal Creek just south of Oak Street and continues southerly over Maple Street and the second crossing of Pinal Creek. The alignment then swings easterly over the Southern Pacific Railroad tracks and Broad Street to the intersection of Ash Street and Hill Street.

The Arizona Department of Transportation proceeded with the Design Public Hearing conducted in the City of Globe on March 8, 1972. At that Hearing the State presented for consideration the major design features of the proposed highway connection. The State, after due consideration of the comments received during and subsequent to the Design Public Hearing and the additional factors that must be considered in highway design, has determined the major design features of this proposed project.

The major design features include an asphaltic concrete roadway varying from 60 to 68 feet in width, providing four 12 foot traffic lanes, two in each direction, 4 foot shoulders on both sides of the roadway and a painted median varying from 4 to 12 feet in width. Curbs, gutters and sidewalks will be constructed on the left side of the roadway for the full project with only short segments of curbs, gutters and sidewalks on the right side of the roadway at the project termini. Drainage will be handled by conventional urban means on the curbed portions of the roadway and handled by ditches, downdrains and outfall lines to Pinal Creek on the remainder of the project.

Three major structures will be required by this project. The first structure is a 210 foot long, 68 foot wide, 3-span structure over Pinal Creek approximately 100 feet south of Oak Street on the new alignment. The next structure to the south is a 90 foot long, 68 foot wide, 3-span structure over Maple Street. The longest is a 1,010 foot long, 60 foot wide, 8-span structure over Pinal Creek, the Southern Pacific Railroad tracks and Broad Street.

The Arizona Department of Transportation has made a study of the environmental impact of the proposed highway connection on the area in which the highway is located and on the public at large that will be using the highway. The Environmental Impact Statement is available for review in the office of Mr. Mason Toles, Division Manager, Environmental Planning Services, 205 South 17th Avenue, Phoenix, Arizona 85007, telephone 261-7767.

Maps, drawings and other pertinent information are available for review in the office of Mr. H. M. Osmus, District Engineer, District VII, Arizona Department of Transportation, Miami, Arizona 85539.

THE FEDERAL HIGHWAY ADMINISTRATION HAS APPROVED THE LOCATION AND MAJOR DESIGN FEATURES AS DESCRIBED ABOVE.

WM. N. PRICE
Assistant Director
& State Engineer

SALT RIVER PROJECT
P.O. BOX 1980
PHOENIX, ARIZONA 85001

SALT RIVER PROJECT POWER

TELEPHONE 273-...

February 17, 1976

U. S. Environmental Protection Agency
Attention: Hearing Office, HE-126
Region IX
100 California Street
San Francisco, California 94111

Gentlemen:

Regarding the Draft Environmental Impact Statement for the Greater Globe-Miami, Arizona Wastewater Treatment Project dated January 1976, the Salt River Project (SRP) would like to offer the following comments on the statement.

SRP supports the recommended alternative, that is, alternative number 3 (a regional aerated lagoon treatment plant located near Pringle Springs with disposal to percolation ponds). This would minimize the loss of water from the effluent discharged.

SRP does have an interest in the phosphate concentrations in the effluent. Any contributions of this discharge to phosphate concentrations downstream would add to the difficulty in achieving the phosphate standards proposed by the Environmental Protection Agency.

Thank you for the opportunity to comment on this statement.

Sincerely,

Frank T. Darmiento

Frank T. Darmiento
Environmental Division

rsk

CITY OF GLOBE
150 NORTH PINE — GLOBE, ARIZONA 85501

RECEIVED
REGIONAL HEARING CLERK
MAR 8 1976
REGION IX

March 3, 1976

United States Environmental Protection Agency
Attention: Hearing Office HE-126
Region IX
100 California Street
San Francisco, California 94111

Dear Sirs:

Please consider this letter a part of the record of that hearing conducted in our city on February 18, 1976 and a follow up to the comments of Councilman George Larson.

At their regular meeting on March 1, 1976, it was the consensus of the Globe City Council that we request assistance of the EPA in extending service to a sizeable section of our population. (Copy of minutes enclosed) This will entail expansion of what is now referred to as Phase II interceptor to include what Councilman Larson has referred to as Phase IV and the lifting of a ban on new connections imposed by EPA on Phase II as a condition of that part of the grant.

I am enclosing a map and a copy of the letter from EPA in which I have emphasized the restriction. As you can see a major part of Phase IV would be through unincorporated areas and would not be subject to assessments by the City of Globe. This we believe would qualify Phase IV as a regional project.

Regarding the restrictions on services, we have improved considerably on our oxidation pond and further improvements are being made. We believe that by the time Phase II and Phase IV are completed our treatment will have improved to the point where all restrictions can be lifted.

Respectfully,

Lionel Blair

Lionel Blair
City Manager

LB:dmm

Enclosure

MINUTES OF THE REGULAR MEETING OF THE CITY COUNCIL
OF THE CITY OF GLOBE, ARIZONA

MARCH 1, 1976

Meeting was called to order by Mayor Williams at 7:30 P.M.

The invocation was given by Rev. Harold Brumagin, United Methodist Church, and was followed by the Pledge of Allegiance to the Flag which was led by City Manager, Lionel Blair.

PRESENT: Mayor Williams, Councilmen Aguirre, Bennett, Chiono, Gibson, Larson, and Ollson.

Minutes of the regular meeting of February 17, 1976 were approved as presented.

CORRESPONDENCE

1. Letter was read by City Attorney Tippett to Mayor Williams from Mr. Wm. Edward Crawford regarding the Fire & Police Department building not being accessible to the handicapped.

2. Letter was read by City Attorney Tippett to the Mayor and Council from Mr. Pete Termain of the Gila Centennials requesting that the block on Mesquite between Pine and Broad be closed during the week of September 10 - 19, 1976 for the setting up of booths and street events.

3. Letter was read by City Attorney Tippett to Mayor Williams from Mr. Jonn R. Burleson regarding a meeting to be held March 4, 1976 in respect to the Older Americans Act Title VII Nutrition Program.

COMMITTEE REPORTS

1. Councilman Bennett reported that he and Councilman Aguirre had met with Mr. Osmus of the Highway Department regarding the drainage for Mrs. Renon. Mr. Osmus has advised them that the Highway Department could not do this job as it was on private property.

   Mayor Williams advised that Mr. Ellsworth requested that a plat be made in detail so that everyone would know what exactly was going to be done.

   Councilman Aguirre advised that there is a plat to that effect and that Mr. Rocky Miller has it.

   Mayor Williams advised that a special meeting will be called on Tuesday, March 9, 1976, for discussion and action on this situation.

OLD BUSINESS

1. Councilman Larson requested that the City send a letter to the EPA by March 8, 1976, requesting permission to proceed with Phase 2 and to add Phase 4 to the project. Phase 4 would serve the west and south portions of Skyline Drive.

   Motion was made by Councilman Gibson, seconded by Councilman Larson authorizing Councilman Larson to meet with the City Manager and send the letter to the EPA regarding Phase 2 and Phase 4. YES: Councilmen Bennett, Chiono, Gibson, Larson, Ollson. NO: Councilman Aguirre. Motion carried.

NEW BUSINESS

1. Motion was made by Councilman Ollson, seconded by Councilman Chiono to appoint Mr. Ed Hindenberg on the Planning & Zoning. Motion carried unanimously.

2. Moation was made by Councilman Gibson, seconded by Councilman Larson to appoint Mr. Jerry McCreary to the Planning & Zoning. Motion carried unanimously.

1. Discussion as to whether the City of Globe should sign the Certification by Local Government of Need for Assignment of Health Personnel by the National Health Service Corps.

Motion was made by Councilman Gibson, seconded by Councilman Larson to approve the Certification by Local Government of Need for Assignment of Health Personnel by the Nat'l Health Service Corps. Motion carried unanimously.

2. Approval of transfer of Liquor License at Mark's Tavern from Mark & Glady's Williams to C. Alfred Chartz

Motion was made by Councilman Ollson, seconded by Councilman La[illegible] to approve the transfer of liquor license at Mark's Tavern fro[illegible] Mark & Glady's Williams to C. Alfred Chartz. Motion carried unanimously.

3. Approval to donate to the Bicentennial from the Revenue Sharing

Motion was made by Councilman Gibson, seconded by Councilman Aguirre to donate $6,000 to the Bicentennial from Federal Revenue Sharing. YES: Councilmen Aguirre, Bennett, Gibson, Larson. NO: Councilmen Chiono and Ollson. Motion carried.

Councilmen Ollson and Chiono clarified their vote by stating that they were not opposed to donating the money, but they are opposed to the money being taken from Revenue Sharing.

4. Approval of request of Steve Hyman to abandon a portion of the cul-de-sac at the west end of Prickly Pear in El Mirador

Motion was made by Councilman Larson, seconded by Councilman Bennett to approve the abandonment of a portion of the cul-de-sac at the west end of Prickly Pear in El Mirador. Motion carried unanimously.

5. Approval of parking resolution at the intersection of Willow and Broad Streets

This item was postponed pending the Special Meeting on Tuesday, March 9, 1976.

6. Approval of change of parking on the west side of Hill between Oak and Cedar

Motion was made by Councilman Ollson, seconded by Councilman Gibson approving the change of parking on the west side of Hill between Oak and Cedar subject to written approval of the property owner. Motion carried unanimously.

7. Approval of change of parking situation on the S. side of Oak Street from the alley to N. Pine

Councilman Gibson explained that Miss Sawaia, owner of the Down Beat, had requested the restoration of parking from the alley to N. Pine.

Councilman Bennett stated that he had discussed the situation with Mr. Osmus and that Mr. Osmus had stated that the parking restrictions were only temporary until the bypass is completed.

Councilman Larson then stated that by the Sherriff's Office there is parking from the alley on back.

Motion was made by Councilman Gibson, seconded by Councilman Chiono to request the Highway Department to restore the 3 parking spaces on the south side of Oak Street from the alley to N. Pine. YES: Councilmen Chiono, Gibson, Larson, Ollson. NO: Councilmen Aguirre and Bennett. Motion carried.

Mayor Williams appointed Councilmen Gibson and Larson to continue meeting with the Highway Department on this parking situation.

8. Approval of accounts payable

Motion was made by Councilman Ollson, seconded by Councilman Chiono to approve accounts payable. Motion carried unanimously.

PRESENTATIONS FROM THE PUBLIC

1. Mr. Ross Bittner addressed the Council regarding the cemetery. He commended the employees for the care and work being done on the cemetery. His question was on the new section regarding the sprinklers and the hydrants that have been installed.

   City Manager Blair advised that the hydrants were installed to provide better coverage.

   Mr. Bittner also inquired once the bypass is completed if the Council plans to go back into the downtown section to restore the parking in the downtown area.

   Mr. Bittner was advised that the Council had in mind once the bypass was completed to make changes in the downtown area.

Motion was made by Councilman Ollson, seconded by Councilman Chiono to adjourn.

Meeting adjourned at 8:20 P.M.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
100 CALIFORNIA STREET
SAN FRANCISCO, CALIFORNIA 94111

AUG 15 1975

Honorable G. H. Williams
Mayor, City of Globe
150 North Pine
Globe AZ 85501

RE: Globe Wastewater Treatment Facilities EPA Project No. C 04 0128

Dear Mayor Williams:

As agreed at our meeting in Globe on July 2, 1975, the Environmental Protection Agency (EPA) has initiated preparation of the Environmental Impact Statement on your proposed project. At this time we would like to clarify the intent and scope of the EIS and inform you of our decision regarding the Phase II interceptor.

It is our understanding that the project which the City of Globe is presently proposing for construction with Federal grant assistance differs from the original proposal on which the grant was based in 1972. We understand the present proposal to include interceptors and a sewage treatment plant to serve only the City of Globe and the Cobre Valley Sanitary District. This subregional project has been divided by the City of Globe into three construction phases. Phase I, which has already been constructed, is an interceptor from the existing Globe lagoon to the proposed subregional plant site at the confluence of Pinal Creek and Miami Wash, including a tributary branch to the Cobre Valley Sanitary District sewer system. Phase II is an interceptor from the confluence of Ice House Canyon and Pinal Creek to the existing Globe lagoon. Phase III is a sewage treatment plant of the contact-stabilization type which is designed for an average flow of 2.2 million gallons per day and includes effluent storage and pumping facilities. However, it appears that the Phase III proposal has been modified by the City to allow intermittent discharge of treated effluent to Pinal Creek near the plant site since the copper companies have made no firm commitments for total effluent reuse.

Please advise us immediately if the project which the City of Globe proposes to construct with Federal grant assistance differs from the understanding described above. In the absence of a response, we will assume our understanding to be correct and will continue with preparation of an Environmental Impact Statement focusing on Phase III of the proposed project.

Generally, the EIS will thoroughly analyze the project as described above and all of its viable alternatives. The analysis will address alternative treatment facility locations, treatment capacities, treatment processes, and means of effluent disposal. The purpose of the analysis is to disclose and compare the potential environmental effects of the project alternatives. Based on the analysis, EPA will indicate in the EIS the project which is most acceptable given the economic, social and environmental constraints.

Please be aware that the most acceptable project thus identified may conceivably differ from your present proposal. If this should prove to be the case, Federal construction grant assistance for Phase III would be withdrawn unless the City should choose to revise its proposed project. In this case, to retain Federal grant assistance for Phase III the City could propose either the project as recommended in the EIS or an alternative which had not been considered in the EIS but which the City could demonstrate was equal or superior to the EIS recommendation.

As implied above, however, EPA has determined that the Phase II interceptor is not related to the environmental issues to be addressed in the Environmental Impact Statement which we are preparing. Further, we have determined that initiation of design and construction of the Phase II interceptor will not foreclose any of the alternatives to be examined in the Environmental Impact Statement.

Consequently, we hereby authorize the City to proceed with finalization of plans and specifications for the Phase II interceptor. These must be submitted in duplicate no later than February 1, 1976, to the Arizona Department of Health Services (ADHS) for review and comment/approval. Upon joint ADHS/EPA approval of the Phase II inceerceptor plans and specifications and demonstration by the City of ability to finance the local share of this portion of the project, the City will be authorized to advertise for and open bids on the Phase II interceptor.

However, prior to submittal of the final plans and specifications, the City must submit two copies of a brief report to ADHS analyzing the Phase II interceptor concept and design criteria. This report will either verify that the original proposal is consistent with current population projections and planned service area, or propose revised design criteria to ensure such consistency.

Please note that the Phase II interceptor must be designed to deliver all raw sewage to the site of the existing oxidation pond operated by the City of Globe until a subregional or regional sewage treatment plant is complete and operational.

Furthermore, prior to authorizing bid advertisement for Phase II, EPA will require the City to agree to limit additional connections to the sewer system tributary to the Phase II interceptor until the existing overloaded oxidation pond is either replaced or upgraded. The City must submit to ADHS and EPA a letter of intent to comply with this requirement. Finally EPA will require the City to submit a brief report indicating operational or physical improvements to the existing oxidation pond which the City will implement to provide immediate improvement to treatment efficiency and effluent quality.

If you have any questions, please contact Doug Mackay, the Construction Grants Branch Project Evaluator, at (415) 556-2550.

Sincerely,

Sheila M. Prindiville

Sheila M. Prindiville
Director, Water Division

cc: Arizona State Department of Health Services,
Attn: Bob Follett (w/incoming)
John Carollo Engineers, Attn: Don Priesler (w/incoming)
Mr. Mitchell Platt, Attorney at Law (w/incoming)
Mr. Jim Crosby, Special Assistant for Congressman
John B. Conlan (w/incoming)

(1) In the early 50's the mayor of the city of Globe who was at that time Mayor Gordon Langham came up with the idea of selling the sewer water from the Globe Sewer System to one of the ~~of~~ mining companies in the area. ~~The co~~

The company was real interested at the time they were approached on the idea. At that time the State Health Dept. got in the act and required ~~that~~ the water had to be treated due to the fact that it was unsafe where people were involved in handling it, which brought the cost of the water up to where it would not be profitable to use so this dropped and the water continued to flow down Pinal Creek.

~~apr~~ 6 years ago the ~~State~~ Health Dept. came to the city of Globe and said the city could no longer use the lagoon that was in service at ~~that~~ time, but ~~that~~ the city would have to go to a 2 lagoon system, one would collect so much solids and then switch to the other one allowing #1 to dry out and the solids removed.

(2) when #2 collects all of the city the [illegible] goes back to #1 and keep up the [illegible]

Shortly after the 2 lagoons were completed, even before the city of Globe had time to pipe the sewage into the lagoons around the area the State Health Dept came back to the City telling them they couldn't use the lagoons due to stream pollution but that the entire Globe-Miami area would have to go into one project for every body whether in the city of Globe, Town of Miami ~~[illegible]~~ or the area that was in the County, and that federal aid is available for such a project.

So all the government agencies in the area started to form the sanitation improvement district and apply for the federal aid.

Due to federal, State and County laws requirement the local governments concluded that the city of Globe should be the one to head up this program with the proper boards - committees necessary to get the project completed

(3)
But this ended up the city of Globe the only one in the project, which has been a big cost to the city of Globe tax payers -

Now go back to the sale of water in the 50's we were stopped by the health dept.

Go back 6 years ago to the lagoons ~~they~~ we were stopped on that by the health dept.

we have been stopped on the Greater Globe Miami Sewer Project twice

Now the state health dept. has come back and told us we can use the 2 lagoon system which was turned down 6 yrs ago.

I wish some of the federal funded agencies or the State of Arizona would come in and give something we could that we can do.

(4) I think that the City of Globe has done everything possible to overcome this problem in question.

In the meantime the sewer water continues to flow down Pinal Creek.

The copper companies no doubt would like to have this water if the cost is permissible, but now you want to move the project farther down stream which brings the cost of the water up due to the added pumping cost.

This should explain why we cannot get an agreement with the copper companies that they will take the water. Who knows what it will cost.

Who knows when we will be stopped again.

George B. Olson

City of Globe Councilman

P.O. Box 172
Miami, Ariz.
2/24/76

Dear Sirs:

I would like to go on record as objecting to the location of the "sewer plant" in the Wheatfields area, especially the first proposed site.

I my personal opinion the plant should be rebuilt in the Globe area or the Cobre Valley Sanitary District area.

Thank you for your attention,

Mrs. Julia Steinke

Globe, Arizona
March 3, 1976

U. S. Environmental Protection Agency
H. E. 126
100 California Street
San Francisco, California 94111

RECEIVED
REGIONAL HEARING CLERK
MAR 8 1976
REGION IX

Dear Sirs:

This letter is to register our opposition to placing the waste water treatment plant in site 3 or in any and every other area in Wheatfields as is in Environmental Impact Statement in Greater Globe-Miami, Arizona Wastewater Treatment Project for the following reasons:

1. project is not feasible because of high cost.

2. discriminatory if plan is completed--beneficial for some citizens but less beneficial and even detrimental to others who have to pay same

3. there will be mosquitos and other insects and the smell will be there always

4. would take away our pasture lease from the company

5. will be disruptive as far as environmental, social or monetary impacts are concerned

6. will pollute the water in the creek and wells and bet it will pollute the water in Salt River.

We do hope that you will reconsider these plans and really think of the great damage it will do to this area.

Thanking you for your kind reconsideration, we are praying you will find another solution that will solve the problem but will not hurt anyone or any area.

Sincerely,

Dear Sirs:

This letter is to register our protest against the Environment Impact Statement. We are opposed to the waste water treatment plant in Section 3.

This project will much too expensive and is not feasible. Cannot understand how it is beneficial to one group and not to another, when the circumstances are the same or nearly the same. The upkeep will be expensive and abandonment would be tragic to area.

This area has produced food for the entire community until recent years, and the need may arise in the near future to do the same. It is hard to see that a protective agency wants to protect one area and harm another.

What assurance to we have of water being protected? This is a serious problem. Cattle and milk products would be hampered by the new conditions. Is this beneficial to residents who pay taxes and support all interests?

Thank you for your kind and quick consideration of this letter.

Sincerely,

Mr. and Mrs. Martin Setka and family

Mr. and Mrs. Steve Setka, Sr. and family

Mr. and Mrs. Steve Setka, Jr. and family

Mr. and Mrs. Robert Inman and family

Mr. and Mrs. Raymond Berry and family

Mr. and Mrs. Andy Setka and family

Mrs. [illegible] Setka

This is our home (those born, raised, and [illegible].) We are scattered from Maine to California at the present time.

RECEIVED
E P A REGION IX

MAR 8 10 29 AM '76

Dear Sirs:

RECEIVED
REGIONAL HEARING CLERK

MAR 8 1976

REGION IX

This letter is written to register our protest of the Environment Impact Statement favoring site 3 for a waste water treatment plant.

We are opposed to it and any project in the Wheatfield area. It would be very expensive and cannot be controlled properly. How come it is beneficial for some residents and detrimental to others?

The entire lower valley would be ruined and at one time it was the sole support for the entire community. This could be necessary again in the near future at the rate the land developers are ruining Salt River Valley and other farming areas.

You are a protective agency. Who are you protecting? Aren't all residents important and aren't all areas to be considered very, very carefully? Thank you for your [illegible] and quick [illegible] letter.

Sincerely yours,

Mr. and Mrs. [illegible] Collins
Mrs. Eva [illegible] [illegible] and farm
Mr. and Mrs. [illegible] [illegible] and farm
Mr. and Mrs. [illegible] [illegible] and farm
Mr. and Mrs. [illegible] [illegible] and farm
Mr. and Mrs. E. [illegible] [illegible] and farm
Mr. and Mrs. Pat [illegible] and farm

This is our home (has been, is, and will be) but are scattered from Maine to California at the present time.

Holbrook, Arizona
March 6, 1976

U. S. Environmental Protection Agency
H. E. 126
100 California Street
San Francisco, California 94111

Gentlemen:

I strongly protest the placing of the waste water treatment plant in Site 3 or in any other place in the area as is stated in the Environmental Impact Statement in Greater Globe-Miami, Arizona, Waste Water Treatment Project.

It will benefit some, but it will be a hazard to others; it will pollute the water in the creek and the wells in the area; it will also contaminate the Salt River--water goes to Roosevelt Dam and to the Salt River Valley (greater Phoenix area).

Furthermore, there will be the awful odor and mosquitoes in the area. Its planned location is near farms on which families live; they, too, should have clean water and clear air.

It would also take away the pasture lease from the mining company for my family who lives there. My family would also have to pay for this plant and not get any benefit from it at all. Their neighbors would also suffer as well as the people in the greater Phoenix area--through the Salt River.

The land developers are ruining our country. They build and sell homes and lots with many promises. Then, they go bankrupt and do not have to meet the promises they made--like sewer, water, etc. Then, they start all over again. This is not right either.

The cost is prohibitive to go out that far from the Globe-Miami area. A site closer to that area would be more feasible. A site should be chosen where homes and farms are not located.

Please check into this matter before any decision is made in regards to this waste water treatment plant site. Thank you very much.

Sincerely yours,

Annie A. Koury
(Mrs. John Koury)
615 West Florida
Holbrook, Arizona 86025

MGMSFOT HSB
2-025469E066 03/06/76
ICS IPMMTZZ CSP
2074392428 MGM TDMT ELLIOTT ME 100 03-06 0102P EST

western union Mailgram

UNITED STATES POSTAL SERVICE
U.S.MAIL

US ENVIRONMENTAL PROTECTION AGENCY
HE126 100 CALIFORNIA ST
SAN FRANCISCO CA 94111

I WISH TO EXPRESS MY OPPOSITION TO PLACING THE WASTE WATER TREATMENT IN SITE THREE IN WHEATFIELD ARIZONA AS IN THE ENVIRONMENTAL IMPACT STATEMENT IN GREATER GLOBE-MIAMI ARIZONA WASTE WATER TREATMENT PROJECT DETAILED LETTER WILL SOON FOLLOW

EDWARD KOURY
3 HEATHER RD
ELLIOTT ME 03903

13:03 EST

MGMSFOT HSB

I commend the EPA and their technical assistants in doing a thorough, objective and professional job in compiling the Draft EIS on the Greater Globe-Miami Wastewater Treatment Project.

I agree with the statement on page 131 which says: "Alternative 3 is the recommended plan, because it achieves the widest regional benefits without disruptive environmental, social or monetary impacts".

Local taxpayers are most fortunate in the conclusion at the bottom of page 3 which says: "Alternative 3 is judged to have the least adverse cost impact on local residents".

If the City of Globe, the Town of Miami and the Cobre Valley Sanitary District will implement the plan and construct the unsophisticated sewage treatment plant provided in Alternative 3 they can solve their sewer problems. This should appeal to the residents and taxpayers of these communities because Alternate 3 will be the cheapest of all Alternatives to construct, maintain and operate.

The implementation of Alternative 3 will also make a simple gravity-flow sewer system available to the other unincorporated, suburban residential areas, if and when needed, in the future.

Many concerned residents and property owners in Wheatfields hope the Final EIS will be the same as the Draft EIS without any major changes.

This EIS should result in protecting the human environment of the Greater Globe-Miami Area and in the construction of a necessary modern wastewater treatment and disposal system.

Stephen L. Bixby

Stephen L. Bixby
February 18, 1976
P.O. Box 311
Globe, Arizona 85501

GLOSSARY

ADVERSE - An impact which is unfavorable, detrimental or harmful to man or nature.

BENEFICIAL - An impact which is advantageous or promotes health and well being for man or nature.

COST-EFFECTIVE - A wastewater treatment project that results in minimal economic, environmental and social costs.

EFFECTIVE DEMAND - The level of purchasing activity necessary to stimulate new housing development.

EMINENT DOMAIN - A right of a government to take private property for public use by virtue of the superior dominion of the sovereign power over all lands within its jurisdiction.

ENVIRONMENTAL - The aggregate of biological, physical, social and cultural conditions that influence the life of an individual or community.

EIS - Environmental Impact Statement.

EPA - Environmental Protection Agency.

EPHEMERAL - Lasting a very short time.

FEDERAL REGISTER - Publication of the U. S. Government describing administrative, policy and procedural regulations of the various governmental agencies.

LIFE ZONES - A system of ecological classification in western North America, based upon the observed altitudinal and latitudinal distribution of plants and associated animals. These zones are mapped on the basis of plant species occurrences.

LONG-TERM IMPACT - Impacts that have an extended time frame of effect. These usually last the length of the project or beyond it, and are often associated with its operation.

MITIGATION - Measures designed to reduce the intensity or severity of an impact.

NPDES - National Pollution Discharge Elimination System.

NEUTRAL - An impact which has neither a beneficial nor adverse effect.

PRIMARY IMPACT - A direct impact, one that is in first order of time. For example, the damming of a river has a primary impact on fish migration.

PROBLEMATICAL - An impact in which the exact effect is not definite at the present time.

SECONDARY IMPACT - An indirect impact, one that usually occurs as the result of another action. For example, a change in land use zoning that would allow more residential development in an area, could also create secondary impacts of increasing traffic, air pollution, energy use, etc.

SECONDARY TREATMENT - Processes to reduce the amount of dissolved organic matter and further reduce the amount of suspended solids in sewage. The effluent from the primary treatment process is given additional treatment with processes such as activated sludge or trickling filter.

SHORT-TERM IMPACT - Impacts that have time frame of effect that is less than one year. These impacts are often related to construction effects.

TAILINGS PONDS - Large open pit type ponds that receive a liquid slurry from copper mining and processing.

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APPENDICES

APPENDIX A

TYPICAL VEGETATION OF THE GLOBE-MIAMI REGION

Common Name	Scientific Name
Creosote Bush-Bur Sage Community	
White bur sage (burro bush)	*Franseria dumosa*
Creosote bush	*Larrea divaricata*
Catclaw	*Acacia greggii*
Blue paloverde	*Cercidium floridum*
Foothill paloverde	*Cercidium macrophyllum*
Mesquite	*Prosopis juliflora*
Smoke tree	*Dalea spinosa*
Brittle bush	*Encelia farinosa*
Ocotillo	*Fouquieria splendens*
Ironwood	*Olneva tesota*
Grama-Tobosa Shrubsteppe Community	
Black grama	*Bouteloua eriopoda*
Tobosa	*Hilaria mutica*
Creosote bush	*Larrea divaricata*
White thorn	*Acacia constricta*
Three-awn	*Aristida* spp.
Galleta	*Hilaria* spp.
Mentzelia	*Mentzelia affinis*
Cactus	*Optunia* spp.
Dropseed	*Sporobolus* spp.
Mesquite	*Prosopis juliflora*
Oak-Juniper Woodland	
Alligator juniper	*Juniperus deppeana*
Oneseed juniper	*Juniperus monosperma*
Emory oak	*Quercus emoryi*
Ceanothus	*Ceanothus* spp.
Nolina	*Nolina* spp.
Oaks	*Quercus* spp.
Sumac	*Rhus* spp.
Mountain Mahogany-Oak Scrub Community	
Mountain mahogany	*Cercocarpus ledifolius*
Gambel oak	*Quercus gambelii*
Ceanothus	*Ceanothus velutinus*
	Cowania mexicana
Oaks	*Quercus* spp.
Riparian Community	
Cottonwood	*Populus fremonti*
Sycamore	*Platanus racemosa*
Oaks	*Quercus* spp.

Appendix B

WILDLIFE SPECIES CHARACTERISTIC OF THE SONORAN DESERT REGION OF ARIZONA

Common Name	Scientific Name
Fishes	
Longfin dace	Agosia chrysogaster
Mosquito fish	Gambusia affinis
Gila mountain sucker	Pantosteus clarki
Reptiles	
Leopard lizard	Crotaphytus wislizeni
Side-blotched lizard	Uta stansburiana
Desert banded gecko	Coleonyx variegatus
Gila monster	Heloderma suspectum
Desert horned lizard	Phrynosoma sp.
Banded sand snake	Chilomeniscus cinctus
Glossy snake	Arizona elegans
Spotted night snake	Hypsiglena torquata
Black tailed rattlesnake	Crotalus molassus
Western rattlesnake	C. viridis
Western diamond back rattlesnake	C. atrox
Birds	
Pacific horned owl	Bubo virginianus pacificus
Western burrowing owl	Speotyto cunicularia hypogaea
Barn owl	Strix pratincola
Elf owl	Micrathene whitneyi
Long-eared owl	Asio wilsonianus
Desert warbler	Vermivora luciae
Yellow warbler	Dendroica petechia
Arizona crested flycatcher	Myiarchus tyrannulus
Say's phoebe	Sayornis saya
Black phoebe	S. nigricians
Desert kestrel	Falco sparverius deserticola
Red-tailed hawk	Buteo borealis
Black hawk	Buteogallus anthracinus
Turkey vulture	Cathartes aura
Gambel's quail	Lophortyx gambeli
Mexican jay	Aphelocoma ultramarina
Gila woodpecker	Centurus uropygialis
Common flicker	Colaptes auratus
Ladder-backed woodpecker	Dryobates scalaris
Roadrunner	Geococcyx californianus
Purple martin	Progne subis
White-throated swift	Aeronantes saxatilis
Phainopepla	Phainopepla nitens
Nuttall's poorwill	Phalaenoptilus nuttalli
Ravens and crows	Corrus spp.
White-rumped shrike	Parrius ludovicianus
Texas nighthawk	Chordeiles acutipennis texensis
Leconte's thrasher	Toxostoma lecontei lecontei
Mourning dove	Zenaidura macroura
White-winged dove	Zenaida asiatica
Costa's hummingbird	Calypte costae
Cardinal	Cardinalis cardinalis
Pyrrhuloxia	Pyrrhuloxia sinuata
Cactus wren	Heleodytes brunneicapillus couesi
Mockingbird	Mimus polyglottus
Canyon wren	Catherper mexicanus
Rock wren	Solpinctes absoletus absoletus
Cooper's tanager	Piranga rubra
Summer tanager	Piranga rubra
Western tanager	P. ludoviciana
Desert sparrow	Amphespiza bilineota
Abert's towhee	Pipilo aberti
Gambel's white-crowned sparrow	Zonotrichia leucophrys gambeli
Lark sparrow	Chondestes grammacus
Black-chinned sparrow	Spizella atrogularis
Western meadowlark	Sturnella neglecta
Scott's oriole	Icterus parisorum
Bullock's oriole	I. bullocki
Lesser goldfinch	Spinus psaltria
Mammals	
Blacktail jackrabbit	Lepus californicus
Desert cottontail	Sylvilagus auduboni
Ground squirrel	Citellus spp.
Desert woodrat	Neotoma lepida
Kangaroo rat	Dipodomys spp.
Deer mouse	Peromyscus spp.
Pocket gopher	Thomomys bottae
Ringtail cat	Bassariscus astutus
Coati mundi	Nasua narica
Gray fox	Urocyon cinereoargentatus
Mountain lion	Felis concolor
Bobcat	Lynx rufus
Badger	Taxidae taxus
Peccary	Pecari angulatus
Hooded skunk	Mephitis macroura
Spotted skunk	Spilogale putorus
Mule deer	Odocoileus hemionus hemionus

Source: Compiled from Jaeger, 1957; Peterson, 1960; and Stebbins, 1966.

Appendix C

CULTURAL RESOURCE ASSESSMENT OF THE GLOBE-MIAMI WASTEWATER TREATMENT SYSTEM EXPANSION, GILA COUNTY, ARIZONA

by

Tony F. Weber

for

Ann S. Peak & Associates
Consulting Archeology
8332 Willowdale Way
Fair Oaks, California

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ANN S. PEAK & ASSOCIATES
CONSULTING ARCHEOLOGY

December 18, 1975

Jones and Stokes Associates
455 Capitol Mall, Suite 335
Sacramento, California 95814

Gentlemen:

Ann S. Peak & Associates, Consulting Archeology, is pleased to submit the final report on the Cultural Resource Assessment of the Globe-Miami area Waste-water Treatment System Expansion Project, Gila County, Arizona.

It is believed that the report, which details survey techniques, results, impacts, and recommendations, will satisfy federal, state, and local regulations concerning identification and protection of cultural resources.

It has been a pleasure to work for your firm and we hope we can be of service to you again.

Sincerely,

Ann S. Peak

Ann S. Peak
President

AP:CL

CONTENTS

INTRODUCTION

The proposed wastewater treatment system expansion project includes expansion of the Globe Sewage Lagoon and the Miami Sewage Lagoon treatment plants; potential construction of new treatment plants at alternative sites No. 1 and No. 2; an interceptor route along portions of Miami Wash; and an interceptor route along Pinal Wash from just northwest of the Old Dominion copper mine tailings to a point approximately five miles north of the Bixby Ranch. Location of the project is in portions of sections 4, 5, 10, 14, 15, and 23 T1N, R15E, and sections 6, 7, 18, 19, 20, 29, and 32, T2N,R15E, on the 7.5' U.S.G.S. topographic map, Globe, Arizona, and the 15' U.S.G.S. topographic quadrangle, Rockingstraw Mountain, Arizona.

CULTURAL HISTORY

Indian Period. At the time of European contact with the New World, this area of central and eastern Arizona was populated by the Pima and Papago Indians, with a scattering of Athabascan-speaking nomadic bands. In the greater Phoenix area and its periphery, including the Globe area, there are abandoned farmsteads and ruins of the Hohokam culture. The Hohokam are the presumed predecessors of the modern Pima Indians.

Along with the Hohokam people there appears another puebloan culture (Salado) with distinct traits, who lived harmoniously at the same time with the Hohokam. Besh-Ba-Gowah ruins is an example of a Salado pueblo while Gila Pueblo is attributed to the Hohokam.

The Salado were plateau and canyon dwellers, while the Hohokam lived in the valleys. Other differences occur in pottery construction, style, and decoration; domiciles

(communal multi-storied pueblos for the Salado, with semi-subterranean pit houses for the Hohokam); and in burial patterns. Subsistence also differed as the Hohokam extensively irrigated wild mesquite beans while the Salado cultivated the New World staples of maize, squash, and beans.

To the north of Globe lies the Mogollon Rim, which is the southern boundary of the Mogollon culture. The three cultures--Hohokam, Salado, and Mogollon--assimilated and diffused traits from one to the other, with some buffer zones showing a blend or overlap of cultural influence.

The San Carlos Apache, an Athabascan-speaking tribe, were forced into the present reservation in the 1800's. They continue to hold much of their original reservation lands, with some area loss to later Euro/American settlement.

Spanish Period. As the area surrounding the communities of Globe and Miami is generally arid and was considered by the Spanish to be of low value in terms of productivity, its utilization was of low intensity. Early settlement was concentrated in more fertile land or in mining zones. In addition to the poor quality of the land, the hostile Apache tribes also proved to be an effective deterrent to Spanish settlement. Spanish and Mexican influences were not direct, although successful Apache raids against their villages brought European goods into Indian possession.

American Period. Until the discovery of silver, the area was virtually unused by the whites. In 1871 the land had been designated as the San Carlos Apache Reservation and set aside for the exclusive use of these people. The country is ringed by impenetrable mountains and was so well defended by the Indians that until 1876 it had been considered worthless for any purpose than the home for the 4,500 Apache.

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Globe was first settled in 1876 as a result of a silver boom. The stampede of silver miners invaded the San Carlos Reservation and caused displacement of the tribe. The city's name derives from a globe-shaped boulder of almost pure silver with surface scars said to resemble the earth's continents. The globe was found on the reservation just inside its western boundaries. Here the city was founded, about forty miles west of the old San Carlos agency headquarters. As the center of the conflict connected with Apache pacification, it was referred to as "Hell's Forty Acres." With many more silver discoveries within a 20-mile radius of the "globe," it was not long before the 12-mile land strip containing the precious metal was taken away from the Apache and given to the white men.

At the genesis of the silver strike, Globe comprised a few tents and shacks on the east bank of Pinal Creek, which at that time was a year-round creek. Waters now go underground to flood the underlying vaults of the Old Dominion mine.

Isolation was the greatest problem the city faced as for twenty-two years there were no rail facilities closer than 120 miles. Raiding Apaches also added to the problems of the early miners. The major mine of the territory was the Old Dominion Mine, founded at the location of the "globe" discovery. Today the mine is the most famous historic landmark in the area.

As silver was exhausted, rich copper ore deposits were found beneath the silver lode. Globe became important as a copper producer after 1895, when the Lewiston Bros. of New York bought control and invested millions of dollars. They built a new smelter and a branch rail line which was completed in 1898. From 1898 to 1923 the Old Dominion was one of the greatest copper mines in the world. It retained importance until its closure during the depression of 1931.

The city of Miami is located seven miles west of Globe, lying near the base of the Pinal Mountains. The mining camp came into existence in 1908 as a result of the copper industry's discovery of a cheap reduction for low-grade copper ores. The large-scale milling process made it profitable to mine the extensive deposits which were larger than those at the Old Dominion Mine. The development of the Miami Copper Company and the Inspiration Mining Company soon challenged Globe's exclusive possession of the area's business and that city's triumphant prosperity was threatened.

Both cities have survived many boom eras and interim slumps. In 1917 many skilled hardrock miners left the territory because of a strike by 1,700 union miners against the Old Dominion Mine. Martial law was declared and the 17th Cavalry spent several months at the mine. Eventually they were replaced by infantrymen who built barracks and stayed almost two years.

After the closure of the Old Dominion in 1931, the city of Globe never regained its boom years' prosperity. Today it is a quiet town retaining its identity as the county seat. Tourist traffic is on the increase, with a consequent business improvement.

Miami still continues to thrive on the industry of low-grade copper ore reduction. Although the city was hardhit by the depression slump, the advent of World War II revitalized the mining industry. After the war, production still continued and remains active today.

RESEARCH

Records of previously identified archeological sites and historic features were reviewed through the office of the Arizona State Historic Officer, with ethnographic and local historical literature also reviewed.

Although there were no recorded cultural resources within the impact zones of the proposed project, two famous prehistoric sites are near the town of Globe. Besh-Ba-Gówah ruins, a Salado site, is one mile southwest of the city, while a Hohokam site, Gila Pueblo, lies approximately three miles away. In addition, several Historic Points of Interest are noted in and near Globe.

FIELD ASSESSMENT

The proposed wastewater treatment plant sites were surveyed on foot by the archeologist, with all potential areas of impact carefully examined for evidence of cultural material. All of the project area lies within the floodplain of the Pinal Wash and the Miami Wash with the exception of the treatment plant alternative sites. The Globe Sewage Lagoon, Miami Sewage Wash interceptor route from the confluence of Miami Wash and Pinal Creek to Alternative No. 2 site was spot-checked but was not intensively surveyed.

FIELD ASSESSMENT: RESULTS AND CONCLUSIONS

There was no surface evidence of cultural materiáls in any of the intensively surveyed areas nor at spot-check points along Pinal Wash.

The lack of archeological materials may result from the fact that the area of survey lies within the floodplains of Pinal Creek and the Miami Wash. Although today the creek is generally dry, it was a viable stream predating the mining in the area. The continuing 40-year drought and the presence of the deep Old Dominion Mine vaults beneath the stream channel are the main reasons for the present dry condition.

Pueblo ruins, in general, tend to lie above the flood plains on protected terraces, with former use of the flood plains for crop irrigation.

IMPACT

As there are no identified sites or historic features within the project areas of investigation, there will be no impact on known cultural resources at any of the alternative sites. The probability of buried sites is low, as most of the project area lies in the flood plains. Pueblo settlements and villages occurred along terraces or on protected stream channel banks. However, in the event that structural walls or artifacts relating to prehistoric occupation have been buried and are uncovered during construction procedures, it is recommended that work be halted. A qualified archeologist should then be consulted for further recommendation.

MITIGATION

No further survey work is required at this time at the alternative sites or sewage lagoons. However, if subsequent alternative sites or interceptor routes are to be considered, these should be intensively field investigated for possible presence of archeological sites.

It is noted that the general area has a high incidence of Hohokam villages and farmsteads, and also Salado pueblos, with probability of site occurrence increasing above flood plain areas.

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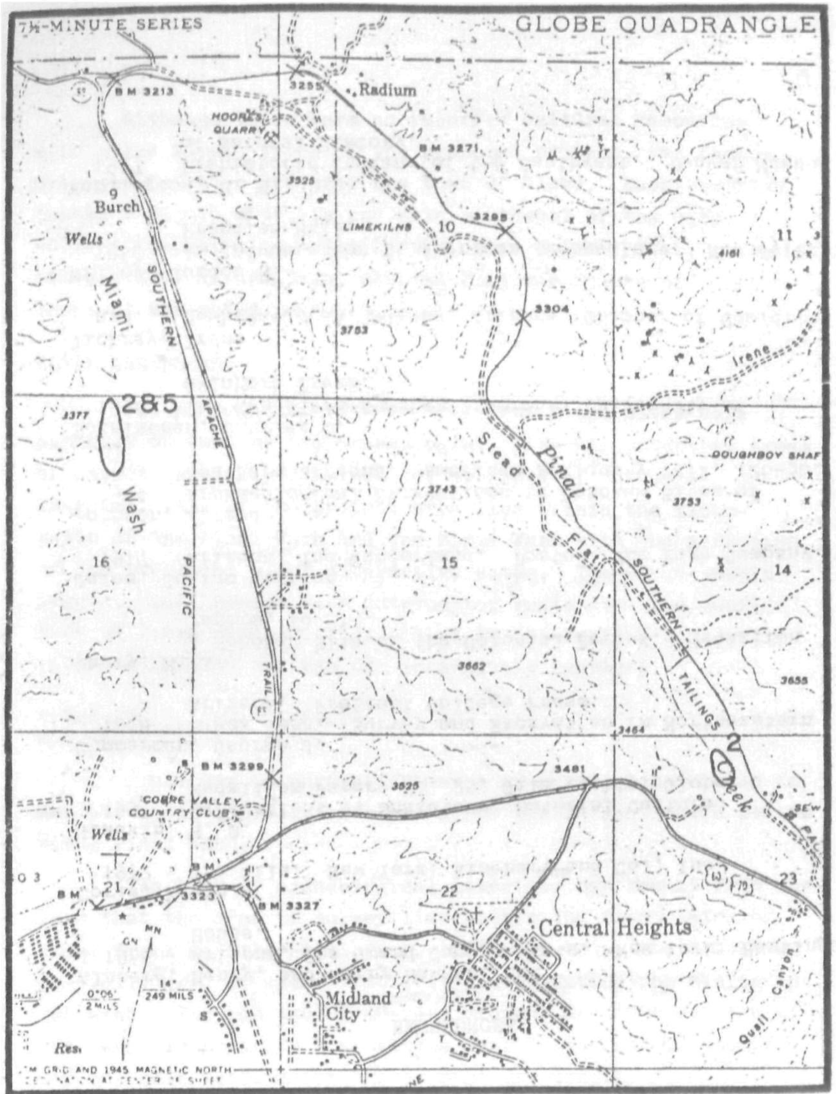
MAPS 1-3

Numbers indicate treatment plants and alternative sites intensively surveyed.

- - - indicates possible interceptor routes which were spot checked by the archeologist.



SCALE 1:24000

1 MILE

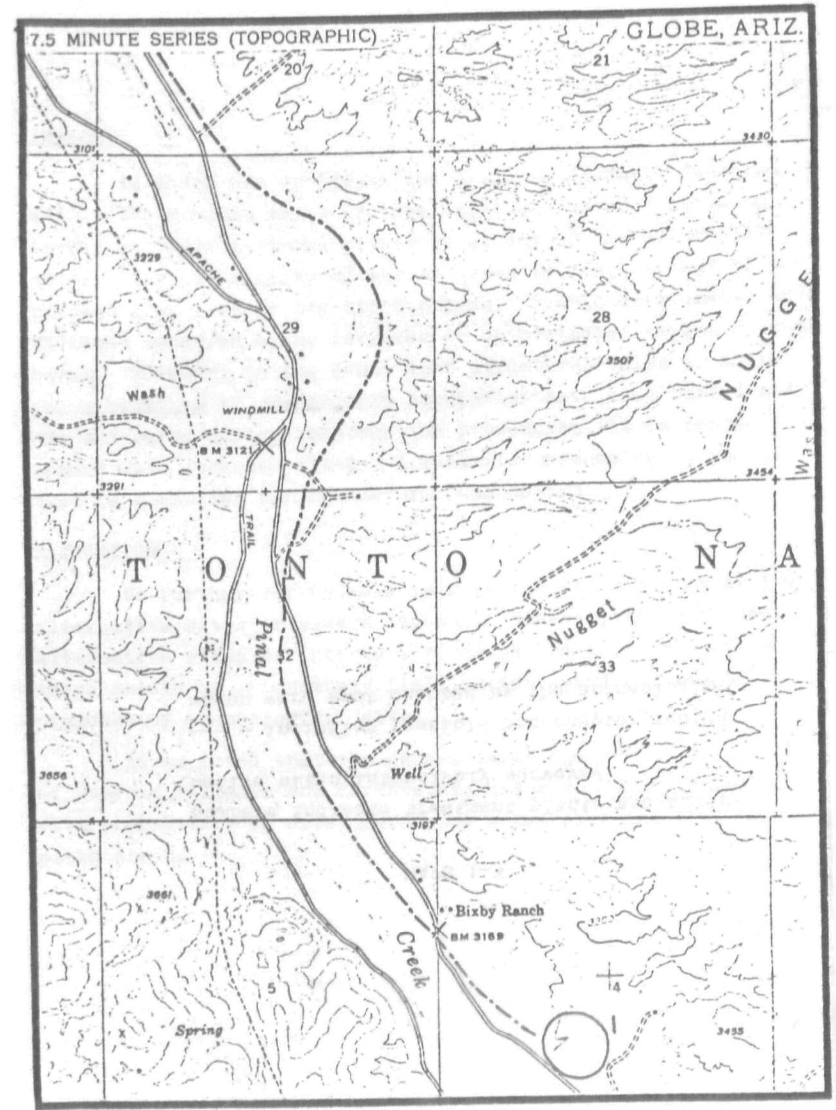
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

Mapped by the Geological Survey
1945

Contour interval 25 feet
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MAP 1



SCALE 1:24000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

Mapped, edited, and published by the Geological Survey

MAP 2

Appendix D

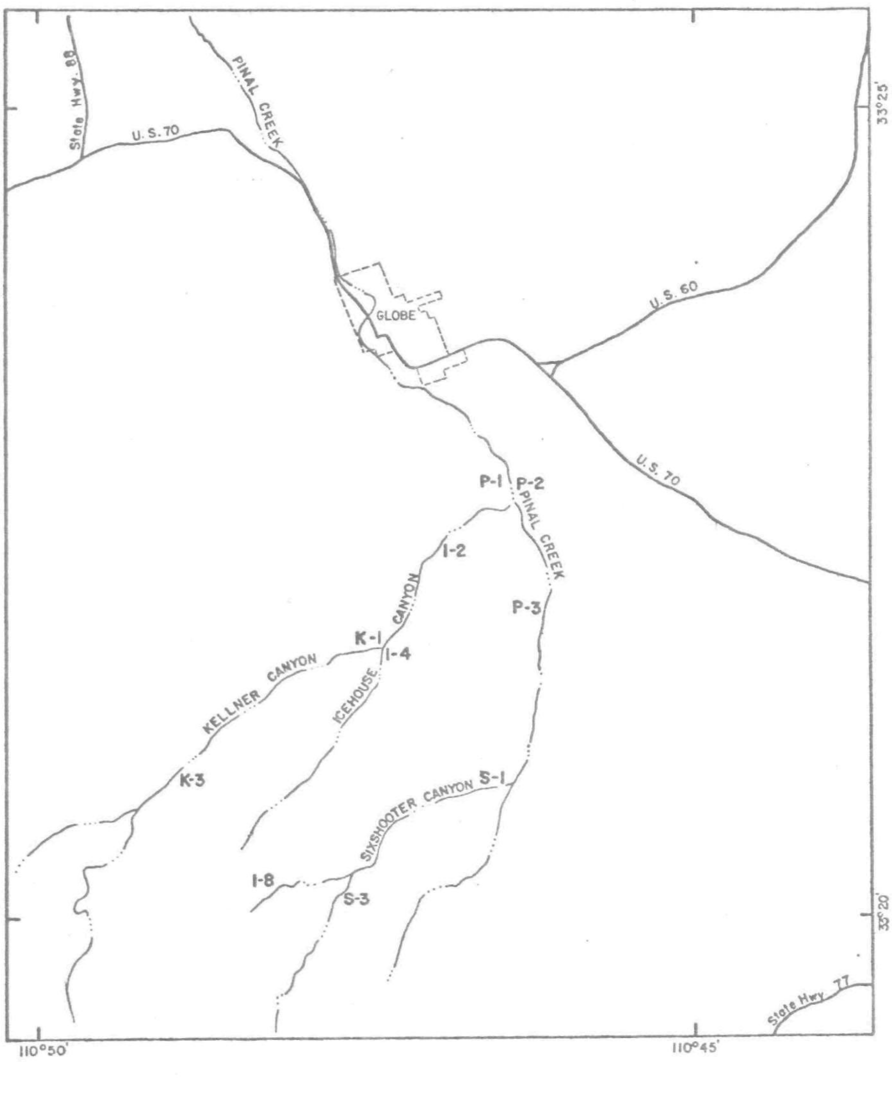
ANALYSES OF SAMPLES OF WATER COLLECTED IN THE UPPER PINAL CREEK AREA, GLOBE, ARIZONA*
APPROXIMATE LOCATION OF SAMPLE STATIONS IS SHOWN ON MAP

Meas. Sta. or Well No.	Date of Collection	Specific Conductance (K x 10^5 at 25°C)	Total Dissolved Solids (calc.)	(Ca)+	(Mg)+	(NaK)+	(HCO_3)+	(SO_4)+	(Cl)+	(F)+	(NO_3)+	Total Hardness as $CaCO_3$ (calc.)
Streams												
K-1	Apr. 12, 1945	14.8	--	--	--	--	68	11	3	--	--	52
K-3	do.	10.3	59	8.7	5.0	6.7	48	12	2	0.6	0.1	42
I-1	do.	22.2	--	--	--	--	105	14	4	--	--	--
I-2	do.	19.5	99	18	7.7	9.0	89	15	4	0.3	1.0	76
I-4	do.	21.7	118	20	8.0	14	103	18	5	0.3	1.9	83
I-8	do.	12.4	--	--	--	--	57	11	2	--	--	34
S-1	do.	17.7	--	--	--	--	--	--	3	--	--	--
S-3	Apr. 13, 1945	15.7	--	--	--	12	69	16	3	0.3	0.1	52
P-2	Apr. 12, 1945	23.6	--	--	--	--	--	--	7	--	--	--
P-3	do.	20.6	108	20	8.6	8.0	89	24	3	0.4	0.3	86

*Analyzed by J. D. Hem, Quality of Water Division, Geological Survey (parts per million).

Key:
- Ca Calcium
- Mg Magnesium
- NaK Sodium and potassium
- HCO_3 Bicarbonate
- SO_4 Sulfate
- Cl Chloride
- F Fluoride
- NO_3 Nitrate

Source: Hazen and Turner, 1946.



LOCATION MAP

Appendix E

SURFACE WATER QUALITY DATA, LOWER PINAL CREEK, PRINGLE PUMP STATION

	January 30, 1974	July 24, 1974	December 13, 1974	January 27, 1975	August 6, 1975
Specific resistance	600	450	<400		<400
pH	8.0	7.8	7.8		8.2
Calcium	612	680	687	616	652
Magnesium	461	60	101	128	94
Sodium	70		63	58	70
Iron	0.10	<0.05	0.48	0.29	0.09
Copper	<0.05	<0.05	0.10	0.07	<0.05
Manganese	0.08	0.05	0.15	0.15	<0.05
Zinc	0.01	0.05	0.06	0.05	<0.05
Total alkalinity	160		136	138	130
Chloride	31	34	42	37	33
Nitrates	<1		<1		
Total N	<1				
Sulphate	1,650		1,900	1,850	2,100
Total PO_4	0.2				
Fluorides	0.15		0.15	0.34	0.22
Dissolved solid residue	3,040	2,267	3,235	3,232	3,155
Total suspended solids	28				
Hardness			1,990	2,040	2,020
BOD	102				
Arsenic	0.02	<0.01	<0.01	<0.01	<0.01
Chromium	<0.05		<0.01		<0.01
Cadmium	<0.01	<0.01	<0.01		<0.01
Lead	<0.05	<0.05	<0.05	<0.05	<0.05
Mercury	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Silver			<0.01		<0.01

Source: Arizona Department of Health Services; U. S. Forest Service, unpublished data.

Appendix F

ANALYSES OF SAMPLES OF GROUNDWATER COLLECTED IN THE UPPER PINAL CREEK AREA, GLOBE, ARIZONA

Meas. Sta. or Well No.	Date of Collection	Specific Conductance ($K \times 10^5$ at 25°C)	Total Dissolved Solids (calc.)	$(Ca)^+$	$(Mg)^+$	$(NaK)^+$	$(HCO_3)^+$	$(SO_4)^+$	$(Cl)^+$	$(F)^+$	$(NO_3)^+$	Total Hardness as $CaCO_3$ (calc.)	Depth of Water
Wells													
1a	Apr. 11, 1946	98.6	662	142	28	41	268	258	35	0.3	26	470	66
1c	do	111	670	138	16	58	317	169	73	--	60	460	47
7	Feb. 24, 1945	51.0	298	39	19	37	121	74	38	0.8	31	176	10
11	do	112	728	157	24	49	235	115	112	0.3	155	490	42
21	Apr. 12, 1946	42.3	249	45	13	30	183	46	19	0.4	5.8	166	18
39	Apr. 12, 1945	39.6	227	40	15	27	209	27	13	0.8	0.8	162	20
40	do	25.4	--	--	--	--	--	--	5	--	--	--	8
41	do	29.9	172	30	11	18	126	40	8	0.8	2.1	120	30
42	Apr. 5, 1945	28.0	--	--	--	--	--	--	13	--	--	--	13
47	Apr. 4, 1945	76.7	459	89	39	26	384	105	7	0.7	2.8	382	3
48	do	51.0	286	53	22	23	234	59	11	0.8	2.3	223	7
a/	Dec. 14, 1945	--	472	98	28	21	254	148	33	--	--	362	
b/	do	--	2,354	317	190	78	256	1,539	25	--	--	1,585	

a/ Old Dominion Mine, "domestic water". Analyzed by Miami Copper Company.

b/ Old Dominion Mine, "east side water". Analyzed by Miami Copper Company.

Source: Hazen and Turner, 1946.

Appendix G

ARIZONA WATER COMPANY WELLS
WATER QUALITY ANALYSIS, 1975

Date of Sample	August 18, 1975											
Well Number	3[a]	4[b]	6	7	8	9	10	11	12	13[b]	14[a]	15[2]
Specific Resistance	490	490	2,000	2,200	2,100	2,400	2,000	2,200	1,900	1,900	1,200	1,140
pH	6.2	6.3		7.9	8.0	7.8	8.2	7.7	8.0	8.0	7.9	8.0
Calcium	392	374	14	31	30	38	35	56	30	42	109	39
Magnesium	51	52	3	10	11	13	10	9	7	13	26	16
Sodium	88	92	113	53	67	36	74	35	82	59	53	141
Iron	0.22	0.2	0.05	0.06	0.05	<0.05	0.07	0.07	0.07	0.05	0.8	0.19
Copper	0.3	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05
Manganese	0.3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.16	0.06	<0.05
Zinc	0.1	0.07	<0.05	0.05	<0.05	<0.05	0.09	0.07	<0.05	0.4	0.9	0.5
Total Alkalinity	64	84	240	192	216	192	230	184	174	184	266	254
Chloride	36	42	12	14	15	12	14	19	37	34	30	92
Nitrate	30	44	2	6	3	2	4	9	10	7	3	3
Sulfate	1,160	1,120	6	12	5	8	6	19	24	29	160	42
Fluoride	0.14	0.16	0.34	0.40	0.19	0.24	0.33	0.3	0.53	0.6	0.84	1.7
Dissolved Solid Residue	2,047	1,997	343	309	314	284	326	333	339	317	630	523
Hardness	1,192	1,152	49	120	120	149	130	179	105	160	379	164
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.07	<0.05	<0.05
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Color	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Odor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Turbidity	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Well Depth (feet)	175	153	1,088	588	1,000	900	1,000	801	840	680	700	700

[a] Provisionally acceptable for domestic use.

[b] Rejected for domestic use.

Source: Ihrig, pers. comm.

Appendix H

WATER QUALITY ANALYSIS OF VARIOUS WELLS IN THE GLOBE-MIAMI AREA, 1974

Well	Date of Sample	Depth of Well (feet)	Specific Resistance	pH	Calcium	Magnesium	Sodium	Iron	Copper	Manganese	Zinc	Total Alkalinity	Chloride
EPA MUNICIPAL WATER STANDARDS				5.0–9.0				0.3	1.00	0.05	5.00	No limit	250
ARIZONA WATER COMPANY													
#3-Claypool	1/28/74	120	600	6.9	364	72	76	0.6	0.05	0.06	<0.05	148	134
#4-Claypool	"		640	6.7	368	139	79	0.58	<0.05	<0.05	0.01	148	123
#6-Cent. Hgts.	"	1,188	2,350	8.7	17	3	103	<0.05	<0.05	<0.05	0.3	242	11
#7-Cent. Hgts.	"	588	2,500	7.7	35	14	48	<0.05	<0.05	<0.05	0.2	192	11
#8-Cent. Hgts.	"	1,000	2,550	7.7	42	14	49	1.0	0.08	0.07	0.05	222	13
#9-Cent. Hgts.	"	784	2,500	7.9	48	15	30	3.3	<0.05	0.12	0.02	196	10
#10-Cent. Hgts.	"	982	2,500	7.8	52	57	46	1.1	<0.05	0.06	0.07	192	13
#11-Chap. Ests.	"		2,700	7.7	54	17	30	<0.05	<0.05	<0.05	<0.05	186	15
#12-NE Bixby Ranch	"	840	2,200	7.8	38	12	69	<0.05	<0.05	<0.05	0.01	196	30
ICCC													
Tailings Well (composite)	1/29/74		700	7.2	416	86	70	0.10	<0.05	0.75	0.17	116	43
Pinal Well #1	"		1,400	7.2	116	18	52	0.09	0.10	<0.05	0.2	240	56
Pinal Well #2	"		1,700	7.4	108	11	38	<0.05	<0.05	<0.05	<0.05	202	
Pringle Well #2	"		600	7.2	440	120	63	0.10	<0.05	<0.05	0.2	238	27
Pringle Well #7	"		500		600	168	70	0.1	<0.05	<0.05	0.2	184	29
Pringle Well #14	"		490	7.4	608	139	88	0.08	<0.05	<0.05	0.2	154	28
Kiser Plant #20	"		2,600	7.6	53	7.0	41	<0.05	<0.05	<0.05	0.1	174	12
Kiser Plant #31	"		680	5.3	368	187	60	0.14	0.05	6.1	1.2	16	23
Kiser Plant #60	"		1,600	7.4	101	23	39	<0.05	<0.05	<0.05	0.14	194	[illegible]
Kiser Plant #62	"		1,400	3.2	104	34	47	14	1.7	4.4	0.5	0	10
PRIVATE WELLS													
Tabor, David	1/29/74	260	1,800	7.5	90	18	28	0.13	<0.05	<0.05	0.3	180	36
Fodera, T. P.	"	130	1,380	7.6	158	23	19	0.46	<0.05	<0.05	0.3	144	19
Riley, J. D.	9/9/74		400	7.2	548	141	50	3.5	2.2	28.3	1.3	90	41
Gurman Const.	"		1,000	7.8	112	17	35	0.1	<0.05	<0.05	0.1	192	50
Steinke	"		650	7.5	270	50	41	0.9	<0.05	<0.05	0.7	160	28
Walker Spring	"		800	7.8	122	21	52	0.09	<0.05	<0.05	0.1	158	41
Bixby Ranch	"		400	7.8	492	96	65	<0.05	<0.05	<0.05	0.1	226	40
Bixby Domestic	12/9/74	19*	215	7	490	75	41	<0.05	<0.1	<0.1	<0.1		48
Bixby Irrigation	"	25*	2,400	7.95	10	1	30	<0.05	<0.1	<0.1	<0.1		32
Dr. Bejarano #1	9/9/74		1,200	7.7	64	17	30	0.1	<0.05	0.02	0.5	192	28
Dr. Bejarano #2	"		1,000	8.1	78	17	81	0.07	<0.05	<0.05	0.3	220	77
Dr. Bejarano #3	"		750	8.1	176	24	79	2.3	<0.05	0.05	2.4	224	41
Stanwood	"		400	7.7	468	101	63	0.3	<0.05	0.16	0.3	218	73

Well	Nitrate	Sulfates	Total PO_4	Fluorides	Dissolved Solid Residue	Hardness	Arsenic	Silver	Chromium	Cadmium	Lead	Mercury	Selenium
EPA MUNICIPAL WATER STANDARDS	10	250			No limit		0.1	0.05	0.05	0.01	0.05	0.0[illegible]2	0.01
ARIZONA WATER COMPANY													
#3-Claypool		560		0.21	1,726		<0.01		<0.05	<0.01	<0.05	<0.0005	
#4-Claypool		640		0.23	1,797		<0.01		<0.05	<0.01	<0.05	<0.0005	
#6-Cent. Hgts.		6		0.33	269		<0.01		<0.05	<0.01	<0.05	<0.0005	
#7-Cent. Hgts.		9		0.36	280		<0.01		<0.05	<0.01	<0.05	<0.0005	
#8-Cent. Hgts.		7		0.22	238		<0.01		<0.05	<0.01	<0.09	<0.0005	
#9-Cent. Hgts.		8		0.25	267		<0.01		<0.05	<0.01	<0.05	<0.0005	
#10-Cent. Hgts.		10		0.34	241		<0.01		<0.05	<0.01	<0.05	<0.0005	
#11-Chap. Ests.		13		0.27	300		<0.01		<0.05	<0.01	<0.05	<0.0005	
#12-NE Bixby Ranch		21		0.51	336		<0.01		<0.05	<0.01	<0.05	<0.0005	
ICCC													
Tailings Well (composite)		79[illegible]		0.27	1,731		<0.01		<0.05	<0.01	<0.05	<0.00[illegible]	
Pinal Well #1		60		0.25	598		<0.01		<0.05	<0.01	<0.05	<0.000[illegible]	
Pinal Well #2		85		0.23	533		<0.01		<0.05	<0.01	<0.05	<0.0005	
Pringle Well #2		1,050		0.34	2,026		<0.01		<0.05	<0.01	<0.05	<0.0005	
Pringle Well #7		1,350		0.22	2,776		<0.01		<0.05	<0.01	<0.05	<0.0005	
Pringle Well #14		1,300		0.29	2,793		<0.01		<0.05	<0.01	<0.05	<0.0005	
Kiser Plant #20		35		0.42	297		<0.01		<0.05	<0.01	<0.05	<0.0005	
Kiser Plant #31		825		3.4	1,761		<0.01		<0.05	<0.01	<0.05	<0.0005	
Kiser Plant #60		120		0.60	516		<0.01		<0.05	<0.01	<0.05	<0.0005	
Kiser Plant #62		340		0.34	685		<0.01		<0.05	<0.01	<0.05	<0.0005	
PRIVATE WELLS													
Tabor, David		77		0.24	417		<0.01		<0.05	<0.01	<0.05	<0.0005	
Fodera, T. P.		255		0.16	668		<0.01		<0.05	<0.01	<0.05	<0.0005	
Riley, J. D.	50	1,850	<0.05	3.0	2,988	1,960	<0.01	<0.01	<0.01	<0.012	<0.05	<0.0005	<0.01
Gurman Const.	8	94	0.1	0.24	600	352	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Steinke	6	1,200	0.1	0.24	900	884	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Walker Spring	8	265	0.05	0.34	750	390	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Bixby Ranch	8	1,200	<0.05	0.17	2,573	1,630	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Bixby Domestic	10	1,248		0.5		1,535	<0.01	<0.02	<0.01				
Bixby Irrigation	2	6		0.3		31	<0.01	<0.02	<0.01				
Dr. Bejarano #1	22	32	<0.05	0.40	525	230	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Dr. Bejarano #2	6	72	<0.05	1.7	600	264	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Dr. Bejarano #3	28	395	<0.05	0.16	800	540	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01
Stanwood	41	1,250	<0.05	0.16	1,500	1,590	<0.01	<0.01	<0.01	<0.01	<0.05	<0.0005	<0.01

*Depth of water

Source: Arizona Department of Health Services, unpublished data.

Appendix I

SUMMARY OF PROJECTED LOCAL IMPROVEMENT DISTRICT COSTS

The following seven tables have been copied from "Greater Globe-Miami Wastewater Project Report" prepared by John Carollo Engineers and dated November 27, 1972. On the bottom of each page is typed the projected mid-1976 construction cost of these improvement districts.

LOWER MIAMI AND CLAYPOOL IMPROVEMENT DISTRICT COST *

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
M	8" Pipe	LF	4800	- -	4,800	13.00	62,400	
M-1	8" Pipe	LF	- -	600	600	13.00	7,800	
M-2	8" Pipe	LF	1200	2200	3,400	13.00	44,200	
M-3	8" Pipe	LF	2100	3900	6,000	13.00	78,000	
M-4	8" Pipe	LF	- -	600	600	13.00	7,800	
M-5	8" Pipe	LF	4200	5800	10,000	13.00	130,000	
M-6	8" Pipe	LF	1600	4200	5,800	13.00	75,400	
M-7	8" Pipe	LF	1000	600	1,600	13.00	20,800	
M-8	8" Pipe	LF	1900	4800	6,700	13.00	87,100	
M-9	8" Pipe	LF	-	1600	1,600	13.00	20,800	
-	Pipe Jacking	LF	-	-	300	120.00	36,000	
-	Pavemt Repl	SY	-	-	1,600	12.00	19,200	
			Total Construction Cost					589,500
			18% Administrative & Engineering					106,100
			Total Project Cost					$695,600
	Total Trunk		16,800				$285,200	
	Total Lateral			24,300			$410,400	

* From "Greater Globe-Miami Wastewater Project Report" John Carollo Engineers, November 27, 1972.

THE PROJECTED MID-1976 COST FOR THIS IMPROVEMENT DISTRICT IS $1,174,900.

RUSSELL GULCH IMPROVEMENT DISTRICT COST *

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
L-1	8" Pipe	LF	900	-	900	13.00	11,700	
L-2	8" Pipe	LF	700	2400	3,100	13.00	40,300	
L-3	8" Pipe	LF	4000	4800	8,800	13.00	114,400	
L-4	8" Pipe	LF	4600	5800	10,400	13.00	135,200	
L-5	8" Pipe	LF	-	600	600	13.00	7,800	
L-6	8" Pipe	LF	3200	2300	5,500	13.00	71,500	
L-7	8" Pipe	LF	3300	5800	9,100	13.00	118,300	
-	Pavemt Repl	SY	-	-	1,600	12.00	19,200	
			Total Construction Cost					518,400
			18% Administrative & Engineering					93,300
			Total Project Cost					$611,700

CENTRAL HEIGHTS IMPROVEMENT DISTRICT COST*

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
F-1	8" Pipe	LF	3300	4,000	7,300	13.00	94,900	
F-2	8" Pipe	LF	2600	2,300	4,900	13.00	63,700	
F-3	8" Pipe	LF	3100	10,100	13,200	13.00	171,600	
-	Pipe Jacking	LF	-	-	100	120.00	12,000	
-	Pavemt Repl	SY	-	-	1,000	12.00	12,000	
			Total Construction Cost					354,200
			18% Administrative & Engineering					63,800
			Total Project Cost					$418,000

Total Trunk	9000		$148,000
Total Lateral		16,400	$270,000

* From "Greater Globe-Miami Wastewater Project Report"
John Carollo Engineers, November 27, 1972.

THE PROJECTED MID-1976 COST FOR THIS IMPROVEMENT DISTRICT IS $706,000.

SIXSHOOTER CANYON IMPROVEMENT DISTRICT COST *

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
J-7	8" Pipe	LF	1800	1200	3,000	13.00	39,000	
J-8	8" Pipe	LF	800	400	1,200	13.00	15,600	
J-9	8" Pipe	LF	-	600	600	13.00	7,800	
J-10	8" Pipe	LF	600	1200	1,800	13.00	23,400	
J-11	8" Pipe	LF	200	700	900	13.00	11,700	
J-12	8" Pipe	LF	3200	3700	6,900	13.00	89,700	
J-13	8" Pipe	LF	1800	1100	2,900	13.00	37,700	
J-14	8" Pipe	LF	500	1800	2,300	13.00	29,900	
J-15	8" Pipe	LF	-	300	300	13.00	3,900	
J-16	8" Pipe	LF	-	300	300	13.00	3,900	
J-17	8" Pipe	LF	-	300	300	13.00	3,900	
J-18	8" Pipe	LF	-	300	300	13.00	3,900	
J-19	8" Pipe	LF	-	1400	1,400	13.00	18,200	
	Pavemt Repl	SY	-	-	800	12.00	9,600	
			Total Construction Cost					298,200
			18% Administrative & Engineering					53,7[illegible]
			Total Project Cost					$351,[illegible]

Total Trunk	8,900		$141,100
Total Lateral		13,300	$210,800

* From "Greater Globe-Miami Wastewater Project Report"
John Carollo Engineers, November 27, 1972.

THE PROJECTED MID-1976 COST FOR THIS IMPROVEMENT DISTRICT IS $[illegible]4,4[illegible].

ICEHOUSE CANYON IMPROVEMENT DISTRICT COST*

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
J-1	8" Pipe	LF	-	500	500	13.00	6,500	
J-2	8" Pipe	LF	1500	1700	3,200	13.00	41,[illegible]	
J-3	8" Pipe	LF	300	600	900	13.00	11,7[illegible]	
J-4	8" Pipe	LF	-	900	900	13.00	11,7[illegible]	
J-5	8" Pipe	LF	-	600	600	13.00	7,[illegible]	
J-6	8" Pipe	LF	200	800	1,000	13.00	13,[illegible]	
	Pavemt Repl	SY	-	-	400	12.00	4,[illegible]	
			Total Construction Cost					97,1[illegible]
			18% Administrative & Engineering					17,5[illegible]
			Total Project Cost					$11[illegible],6[illegible]

Total Trunk	2000		$52,[illegible]00
Total Lateral		5100	$82,300

* From "Greater Globe-Miami Wastewater Project Report"
John Carollo Engineers, November 27, 1972.

THE PROJECTED MID-1976 COST FOR THIS IMPROVEMENT DISTRICT IS $193,600.

SOUTH GLOBE, SKYLINE, ETC IMPROVEMENT DISTRICT COST *

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
G-1	8" Pipe	LF	900	700	1,600	13.00	20,800	
G-2	8" Pipe	LF	500	2,000	2,500	13.00	32,500	
G-3	8" Pipe	LF	500	1,600	2,100	13.00	27,300	
G-4	8" Pipe	LF	-	1,800	1,800	13.00	23,400	
G-5	8" Pipe	LF	2400	10,400	12,800	13.00	166,400	
G-6	8" Pipe	LF	1000	3,300	4,300	13.00	55,900	
G-7	8" Pipe	LF	-	1,600	1,600	13.00	20,800	
G-8	8" Pipe	LF	6600	11,900	18,500	13.00	240,500	
G-9	8" Pipe	LF	-	300	300	13.00	3,900	
G-10	8" Pipe	LF	-	200	200	13.00	2,600	
G-11	8" Pipe	LF	-	2,200	2,200	13.00	28,600	
G-12	8" Pipe	LF	800	1,100	1,900	13.00	24,700	
G-13	8" Pipe	LF	6000	8,100	14,100	13.00	183,300	
G-14	8" Pipe	LF	1600	1,800	3,400	13.00	44,200	
G-15	8" Pipe	LF	-	1,200	1,200	13.00	15,600	
G-16	8" Pipe	LF	1100	1,500	2,600	13.00	33,800	
G-17	8" Pipe	LF	-	1,000	1,000	13.00	13,000	
G-18	8" Pipe	LF	500	1,100	1,600	13.00	20,800	
G-19	8" Pipe	LF	1000	1,100	2,100	13.00	27,300	
G-20	8" Pipe	LF	-	200	200	13.00	2,600	
G-21	8" Pipe	LF	-	2,000	2,000	13.00	26,000	
-	Pipe Jacking	LF	-	-	100	120.00	12,000	
-	Pavemt Repl	SY	-	-	3,000	12.00	36,000	
			Total Construction Cost					1,062,000
			18% Administrative & Engineering					191,200
			Total Project Cost					$1,253,200
	Total Trunk		22,900				$368,000	
	Total Lateral			55,100			$885,200	

* From "Greater Globe-Miami Wastewater Project Report"
John Carollo Engineers, November 27, 1972.

THE PROJECTED MID-1976 COST FOR THIS IMPROVEMENT DISTRICT IS $2,116,700.

MIAMI WASH IMPROVEMENT DISTRICT COST *

Main	Item	Unit	Trunk Main	Lateral Main	Total Units	Unit Cost $	Totals $	$
E-1	8" Pipe	LF	7300	5500	12,800	13.00	166,400	
E-2	8" Pipe	LF	800	800	1,600	13.00	20,800	
-	Pipe jacking	LF	-	-	80	120.00	9,600	
			Total Construction Cost					$196,800
			18% Administrative & Engineering					35,400
			Total Project Cost					$232,200
	Total Trunk		8100				$130,600	
	Total Lateral			6300			$101,600	

* From "Greater Globe-Miami Wastewater Project Report"
John Carollo Engineers, November 27, 1972.

THE PROJECTED MID-1976 COST FOR THIS IMPROVEMENT DISTRICT IS $392,600.

Appendix J

ALTERNATIVE 1-A

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

Year	Treatment Cost	PW 76	Interceptor Cost	PW 76	Pumping Plant Cost	PW 76	Storage Reservoir & Outfall Cost	PW 76	Total PW 76
1976	3,872.0	3,872.0	855.2	855.2	228.0	228.0	660.5	660.5	5,615.7
1986	960.0	487.9	-	-	-	-	-	-	487.9
TOTAL		4,359.9		855.2		228.0		660.5	6,103.6
SALVAGE 1996	2,064	533.3	427.6	110.5	68.4	17.7	294.3	76.0	737.5
TOTAL		3,826.6		744.7		210.3		584.5	5,366.1

ANNUAL COST

Year	Treatment Cost	PW 76	Pumping Cost	PW 76	Replacement Cost	PW 76	Total PW 76
1976-81	135.0	553.5	24.3	99.6			653.1
1981-86	147.0	429.8	26.8	78.4			508.2
					478.4	243.1	243.1
1986-91	169.0	352.2	29.3	61.0			413.2
1991-96	177.0	263	31.1	46.4			304.4
							2,127.0
						E =	7,493.1
					Minus P.W. of Effluent		524.4
					1976 PRESENT WORTH OF CAPITAL AND ANNUAL COSTS		$ 6,968.7

ALTERNATIVE 1-A - 1976 CAPITAL COSTS

Component	Capacity or Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Interceptor	Exist Miami ponds to exist Phase I interceptor. L=7700'; Dia.= 15"	$ 177,100	$35,400	$ 212,500
2. Interceptor	Junction Miami interceptor & exist. Phase I interceptor to regional activated sludge treatment plant. L = 2000'; Dia. = 27"	$ 82,000	$16,400	$ 98,400
3. Treatment Plant	Regional activated sludge plant initial capacity = 2.4 mgd	$3,520,000	$352,000(1)	$ 3,872,000
4. Effluent Equalization Facilities	5 Day storage	$ 150,000	$30,000	$ 180,000
5. Effluent Pumping Station	Pumps a 100% equalized flow from the regional plant	$ 150,000	$30,000	$ 180,000
6. Outfall	Regional plant pumping station to Burch P.S., L = 4500'; Dia. = 14"	$ 126,000	$25,200	$151,200
7. Outfall	Burch P.S. to Kiser P.S.; L = 9800'; Dia. = 14"	$ 274,400	$54,900	$329,300
8. Force Main	Lower Wheatfields area to regional plant. L = 21,600'; Dia. = 8"	$ 453,600	$90,700	$544,300
9. Pump Station	Lower Wheatfields area to regional plant.	$ 40,000	$ 8,000	$ 48,000
				$ 5,615,700

(1) Plant has already been designed. Cost is for construction contingencies.

ALTERNATIVE 1-A - 1986 CAPITAL COSTS

Component	Capacity or Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Treatment Plant	Expansion to 2.8 mgd.	$ 800,000	$ 160,000	$ 980,000

Appendix K

ALTERNATIVE 1-B

<u>20-Year Cost Analysis</u>
<u>(in thousands of dollars)</u>

CAPITAL COST

YEAR	TREATMENT COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW 76	STORAGE RESERVOIR OUTFALL & SPRINKLER SYSTEM COST	PW 76	TOTAL PW 76
1976	3,872.0	3,872.0	855.2	855.2	228.0	228.0	297.3	297.3	5,252.5
1986	960.0	487.9	-	-	-	-	-	-	487.9
TOTAL	-	4,359.9		855.2		228.0	-	297.3	5.740.4
SALVAGE 1996	2,064.0	533.3	427.6	110.5	68.4	17.7	127.7	33.0	694.5
TOTAL		3,826.6		744.7		210.3		264.3	5,045.9

ANNUAL COST

YEAR	TREATMENT COST	PW 76	PUMPING COST	PW 76	POWER COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	135.0	553.5	25.2	103.3					656.8
1981-86	147.0	429.8	27.8	81.3					511.1
							478.4	243.1	243.1
1986-91	169.0	352.2	30.4	63.4					415.6
1991-96	177.0	263.0	32.5	48.3					311.3
TOTAL									2,137.9

1976 PRESENT WORTH OF CAPITAL AND ANNUAL COSTS $7,183.8

ALTERNATIVE 1-B - 1976 CAPITAL COSTS

Component	Capacity or Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Interceptor	Existing Miami ponds to existing Phase I interceptor, L = 7700'; Dia = 15"	$ 177,100	$ 35,400	$ 212,500
2. Interceptor	Junction Miami interceptor & exist. Phase I interceptor to regional activated sludge treatment plant. L=2000'; Dia. = 27"	$ 82,000	$ 16,400	$ 98,400
3. Treatment Plant	Regional activated sludge treatment plant. Initial capacity = 2.4 mgd.	$3,520,000	$352,000 (1)	$3,872,000
4. Effluent equalization facilities	Five Day Storage	$ 123,800	$ 26,200	$ 150,000
5. Pump Station	Regional plant to spray disposal.	$ 150,000	$ 30,000	$ 180,000
6. Outfall	Outfall to spray disposal area L = 2300'; Dia. = 14"	$ 64,400	$ 12,900	$ 77,300
7. Disposal Facilities	Spray disposal facilities occupying 14.3 acres	$ 58,300	$ 11,700	$ 70,000
8. Force Main	Lower Wheatfields area to regional plant. L = 21,600'; Dia. = 8"	$ 453,600	$ 90,700	$ 544,300
9. Pump Station	Lower Wheatfields area to regional plant.	$ 40,000	$ 8,000	$ 48,000
				$5,252,500

(1) Plant has already been designed. Cost is for construction contingencies.

ALTERNATIVE 1-B - 1986 CAPITAL COSTS

Component	Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Treatment Plant	Expansion to 2.8 mgd	$ 800,000	$ 160,000	$ 960,000

Appendix L

ALTERNATIVE 1-C

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

YEAR	TREATMENT COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW 76	OUTFALL COST	PW 76	TOTAL PW 76
1976	3,872.0	3,872.0	855.2	855.2	48.0	48.0	16.6	16.6	4,791.8
1986	960.0	487.9	-	-	-	-	-		487.9
TOTAL		4,359.9		855.2		48.0		16.6	5,279.7
SALVAGE 1996	2,064	533.3	427.6	110.5	14.4	3.7	8.3	2.2	649.7
TOTAL		3,826.6		744.7		44.3		14.4	4,630.0

ANNUAL COST

YEAR	TREATMENT COST	PW 76	PUMPING COST	PW 76	POWER COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	135.0	553.3	4.8	19.7					573.2
1981-86	147.0	429.8	5.9	17.3					447.1
							406.4	206.6	206.6
1986-91	169.0	352.2	5.9	12.3					364.5
1991-96	177.0	263.0	7.0	10.4					273.4
TOTAL									1,864.8

1976 PRESENT WORTH OF CAPITAL & ANNUAL COSTS $6,494.8

ALTERNATIVE 1-C - 1976 CAPITAL COSTS

Component	Capacity or Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Interceptor	Existing Miami ponds to exist. Phase I interceptor, L = 7,700'; Dia. = 15"	$ 177,100	$ 35,400	$ 212,500
2. Interceptor	Junction Miami interceptor & exist. Phase I interceptor to regional activated sludge treatment plant, L = 2000'; Dia = 27"	$ 82,000	$ 16,400	$ 98,400
3. Treatment Plant	Regional activated sludge treatment plant. Initial capacity = 2.4 mgd	$ 3,520,000	$352,000(1)	$3,872,000
4. Outfall	Outfall to Pinal Creek; L = 600'; Dia. = 15"	$ 13,800	$ 2,800	$ 16,600
5. Pump Station	Lower Wheatfields area to regional plant.	$ 40,000	$ 8,000	$ 48,000
6. Force Main	Lower Wheatfields pump station to regional plant.	$ 453,600	$ 90,700	$ 544,300
				$4,791,800

(1) Plant has already been designed. Cost is for construction contingencies.

ALTERNATIVE 1-C - 1986 CAPITAL COSTS

Component	Capacity or Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Treatment Plant	Expansion to 2.8 mgd	$ 800,000	$ 160,000	$ 960,000

Appendix M

ALTERNATIVE 2-A

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

YEAR	TREATMENT, PERCOLATION POND COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW 76	OUTFALL COST	PW 76	TOTAL PW 76
1976	980.4	980.4	783.7	783.7	96.0	96.0	-	-	1860.1
1986	338.6	172.1	-	-			-	-	172.1
TOTAL		1152.5		783.7		96.0			2032.2
SALVAGE 1996	783.7	202.5	381.9	101.3	28.8	7.4			311.2
TOTAL		950.0		682.4		88.6			1721.0

ANNUAL COST

YEAR	TREATMENT COST	PW 76	PUMPING COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	49.4	202.5	2.9	11.9			214.4
1981-86	56.7	165.8	4.0	11.7			177.5
					268.4	136.4	136.4
1986-91	63.2	131.7	4.0	8.3			140.0
1991-96	69.2	102.8	5.2	7.7			110.5
TOTAL							778.8

1976 PRESENT WORTH OF CAPITAL & ANNUAL COSTS $2,499.8

ALTERNATIVE 2-A - 1976 CAPITAL COSTS

SUB-REGIONAL AERATED LAGOONS - PERCOLATION POND DISPOSAL

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Miami Lagoons & Percol. Ponds	Capacity for Miami & Wheatfields 0.8 mgd Capacity	$ 292,600	$ 58,500	$ 351,100
2. Globe Lagoons & Percol. Ponds	Capacity for Globe & Upper Pinal Creek. 1.4 mgd Capacity	$ 524,400	$104,900	$ 629,300
3. Pump S				)0
4. Force M				)0

ALTERNATIVE 2-A - 1986 CAPITAL COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Globe Lagoons & Percol. Ponds	Expand by 0.4 mgd	$ 115,500	$ 23,100	$ 138,600
2. Existing Cities Services Plant	Expand by 0.15 mgd	$ 166,700	$ 33,300	$ 200,000
				$ 338,600

Appendix N

ALTERNATIVE 2-B

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

YEAR	TREATMENT COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW76	ADDITIONAL STORAGE OUTFALL, & SPRINKLER SYSTEM COST	PW 76	TOTAL PW 76
1976	869.5	869.5	783.7	783.7	336.0	336.0	333.2	333.2	2,322.4
1986	322.9	164.1	-	-	-	-	15.7	8.0	172.1
TOTAL		1033.6		783.7		336.0		341.2	2,494.5
SALVAGE 1996	454.6	117.5	381.9	101.3	100.8	26.0	146.0	37.7	282.5
TOTAL		916.1		682.4		310.0		303.5	2,212.0

ANNUAL COST

YEAR	TREATMENT COST	PW 76	PUMPING COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	49.4	202.5	10.7	43.9			246.4
1981-86	56.7	165.8	13.6	39.8			205.6
					364.4	185.2	185.2
1986-91	63.2	131.7	14.2	29.6			161.3
1991-96	69.2	102.8	15.9	23.6			126.4
TOTAL							924.9

1976 PRESENT WORTH OF CAPITAL & ANNUAL COSTS $3,136.9

ALTERNATIVE 2-B - 1976 CAPITAL COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Miami Lagoons and storage	Capacity for Miami & Whatefields, 0.8 mgd - 5 days effluent storage	$ 297,600	$ 59,500	$ 357,100
2. Pump Station	Effluent Pumping Capacity	$ 70,000	$ 14,000	$ 84,000
3. Outfall & Disposal	Outfall - L = 400', Dia. = 8" Disposal Spraying Requires 3.9 AC.	$ 36,000	$ 7,200	$ 43,200
4. Globe Lagoons & Storage	Capacity for Globe & Upper Pinal Creek, 1.4 mgd	$ 552,000	$110,600	$ 662,600
5. Pump Station	Effluent Pumping for Globe & Cities Services Plants	$ 130,000	$ 26,000	$ 156,000
6. Outfall & Disposal	Outfall - L = 2300', Dia = 14" Disposal Spraying Requires 10.7 AC	$ 116,500	$ 23,300	$ 139,800
7. Pump Stations	Lower Wheatfields to Miami Lagoons. Two required.	$ 80,000	$ 16,000	$ 96,000
8. Force Main	Lower Wheatfields Pumping Stations to Miami Plant. L = 31,100', Dia. = 8"	$ 653,100	$130,600	$ 783,700
				$2,322,400

ALTERNATIVE 2-B - 1986 CAPITAL COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Globe Lagoons & Storage	Expand by 0.4 mgd	$ 115,500	$ 23,100	$ 138,600
2. Existing Cities Services Plant	Expand by 0.2 mgd	$ 166,700	$ 33,300	$ 200,000
				$ 338,600

Appendix O

ALTERNATIVE 3

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

YEAR	TREATMENT COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW 76	OUTFALL COST	PW 76	TOTAL PW 76
1976	926.4	926.4	2,205.1	2,205.1	-	-	-	-	$ 3,131.5
1986	140.4	71.4	-	-	-	-	-	-	71.4
TOTAL		997.8		2,205.1					3,202.9
SALVAGE 1996	361.9	93.5	1,102.6	284.9					378.4
TOTAL		904.3		1,920.2					2,824.5

ANNUAL COST

YEAR	TREATMENT COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	43.6	178.8			178.8
1981-86	47.4	138.6			138.6
			270.0	137.2	137.2
1986-91	51.1	106.5			106.5
1991-96	53.6	79.6			79.6
TOTAL					640.7

1976 PRESENT WORTH OF CAPITAL & ANNUAL COSTS $3,465.2

ALTERNATIVE 3 - 1976 COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Interceptor	Exist Miami ponds to exist Phase I interceptor, L = 7700'; Dia. = 15"	$ 177,100	$ 35,400	$ 212,500
2. Interceptor	Junction Miami interceptor & exist. Phase I interceptor to regional aerated lagoons L = 36,900'; Dia = 30"	$ 1,660,600	$332,100	$ 1,992,600
3. Lagoons & Percol. Ponds	Regional Aerated Lagoons, maturation (stabilization) ponds, and percolation ponds. 2.4 mgd capacity	$ 772,000	$ 154,400	$ 926,400
				$ 3,131,500

TABLE R

ALTERNATIVE 3 - 1986 COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Lagoons & Percol. Ponds	0.4 mgd expansion	$ 117,000	$ 23,400	$ 140,400

Appendix P

ALTERNATIVE 4

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

YEAR	TREATMENT COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW 76	OUTFALL COST	PW 76	TOTAL PW 76
1976	4,224.0	4,224.0	1,436.6	1,436.6	1,194.0	1,194.0	-	-	6,854.6
1986	960.0	488.0	-	-	-	-			488.0
TOTAL		4,712.0		1,436.6		1,194.0			7,342.6
SALVAGE 1996	2,196.0	567.4	718.3	185.6	358.2	92.6			845.6
TOTAL		4,144.6		1,251.0		1,101.4			6,497.0

ANNUAL COST

YEAR	TREATMENT COST	PW 76	PUMPING COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	135.0	553.5	70.3	288.2			841.7
1981-86	147.0	429.8	77.3	226.0			655.8
					900.0	457.5	457.5
1986-91	169.0	352.2	83.3	173.6			525.8
1991-96	177.0	263.0	88.4	131.4			394.4
TOTAL							2,875.2
							9,372.2

P.W. Value of Effluent = 524.4

1976 PRESENT WORTH OF CAPITAL & ANNUAL COSTS $8,847.8

ALTERNATIVE 4 - 1976 COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Pump Station	Located at termination of existing Phase I interceptor	$ 275,000	$ 55,000	$ 330,000
2. Force Main	Existing Phase I interceptor to location of existing Miami ponds L = 7700'; Dia. = 14"	$ 215,600	$ 43,100	$ 258,700
3. Pump Station	At location of existing Miami ponds	$ 340,000	$ 68,000	$ 408,000
4. Force Main	Location of existing Miami ponds to pump station on Inspiration Road at Elev. 3425'. L = 14,000'; Dia. = 18"	$ 462,000	$ 92,400	$ 554,400
5. Pump Station	Located on Inspiration Road at Elev. 3425'	$ 340,000	$ 68,000	$ 408,000
6. Force Main	Inspiration Road pump station to regional treatment plant L = 2000'; Dia. = 18"	$ 66,000	$ 13,200	$ 79,200
7. Treatment Plant	Regional activated sludge treatment plant. Initial capacity = 2.4 mgd.	$ 3,520,000	$ 704,000	$ 4,224,000
8. Pump Station	Lower Wheatfields Area	$ 40,000	$ 8,000	$ 48,000
9. Force Main	Lower Wheatfields Area to termination of existing Phase I interceptor	$ 453,600	$ 90,700	$ 544,300
				$6,854,600

ALTERNATIVE 4 - 1986 COSTS

COMPONENT	CAPACITY OR PERTINENT INFORMATION	CONSTRUCTION COST	ENGR. & CONTINGENCIES	TOTAL COST
1. Treatment Plant	0.4 mgd Expansion	$ 800,000	$ 160,000	$ 960,000

Appendix Q

ALTERNATIVE 5

20-Year Cost Analysis
(in thousands of dollars)

CAPITAL COST

YEAR	TREATMENT COST	PW 76	INTERCEPTOR COST	PW 76	PUMPING PLANT COST	PW 76	OUTFALL COST	PW 76	TOTAL PW 76
1976	926.4	926.4	848.4	848.4	336.0	336.0			2,110.8
1986	140.4	71.4	-	-	-	-			71.4
TOTAL		997.8		848.4		336.0			2,182.2
SALVAGE 1996	361.9	93.5	424.2	109.6	100.8	26.0			229.1
TOTAL		904.3		738.8		310.0			1,953.1

ANNUAL COST

YEAR	TREATMENT COST	PW 76	PUMPING COST	PW 76	REPLACEMENT COST	PW 76	TOTAL PW 76
1976-81	43.6	178.8	11.8	48.4			227.2
1981-86	47.4	138.6	14.8	43.3			181.9
					404.4	205.6	205.6
1986-91	51.1	106.5	16.6	34.6			141.1
1991-96	53.6	79.6	19.6	29.1			108.7
TOTAL							864.5
					1976 PRESENT WORTH OF CAPITAL AND ANNUAL COSTS		$2,817.6

ALTERNATIVE 5 - 1976 COSTS

Component	Capacity or Pertinent Information	Construction Cost	Engr. & Contingencies	Total Cost
1. Pump Station	Lower Wheatfields area to junction of Miami Wash & Pinal Creek	$ 40,000	$ 8,000	$ 48,000
2. Force Main	Lower Wheatfields pump station to junction of Miami Wash & Pinal Creek L = 23,400'; Dia. = 8"	$ 491,400	$ 98,300	$ 589,700
3. Pump Station	Miami Wash and Pinal Creek	$ 240,000	$ 48,000	$ 288,000
4. Force Main	Miami Wash and Pinal Creek to regional aerated lagoons, L = 7700'; Dia. = 14".	$ 215,600	$ 43,100	$ 258,700
5. Lagoons and Percolation Ponds	Regional aerated lagoons, maturation (stabilization) ponds, and percolation ponds, 2.4 mgd capacity	$ 772,000	$ 154,400	$ 926,400
				$2,110,800

TABLE X

ALTERNATIVE 5 - 1986 COSTS

1. Lagoons and Percolation Ponds	0.4 mgd expansion	$ 117,000	$ 23,400	$ 140,400

ENGINEERS TESTING LABORATORIES, INC.

APPENDIX R

RESULTS OF PERCOLATION TESTS

Jones & Stokes Associates
455 Capitol Mall
Sacramento, California 95814

25 March 1976

Attention: Curtis Spencer

Re: Percolation Testing
Proposed Percolation Ponds
Globe/Miami Treated Sewage Disposal Project

Job No. 612-117
Inv. No. 12-503

In accordance with your request this firm has conducted preliminary percolation tests in augered borings at 11 designated locations. Five test locations adjoin Pinal Creek near an existing City of Globe sewage effluent pond. The remaining six locations adjoin Miami Wash near the foot of two existing mine tailings dams. All test locations were field staked by Jones & Stokes Associates. Three borings were drilled at each location (nominally 5, 10 and 30 foot depths) to provide multiple evaluations. Borings were advanced with 6.63 inch diameter hollow-stem augers. Where possible, augers were withdrawn and tests conducted in unlined borings. Where caving occurred in granular deposits testing was accomplished through the center of the hollow-stem auger string. Groundwater was encountered above the 30 foot level in borings 6 through 11, and percolation evaluations were only attempted at the 5 and 10 foot depths. Additionally, auger refusal was experienced in boring 4 at 17 feet upon a rock formation, preventing testing at 30 feet.

The results of the field exploration indicate the best potential sites for percolation ponds occur at test boring locations 1, 2, 3, 6, 7, 10 and 11, where clayey soils are either non-existent or limited to a shallow surface mantle.

Results of classification tests for typical recovered auger cuttings, results of field percolation tests, and boring logs describing subsurface profiles are appended.

Please do not hesitate to contact us if we can be of additional service.

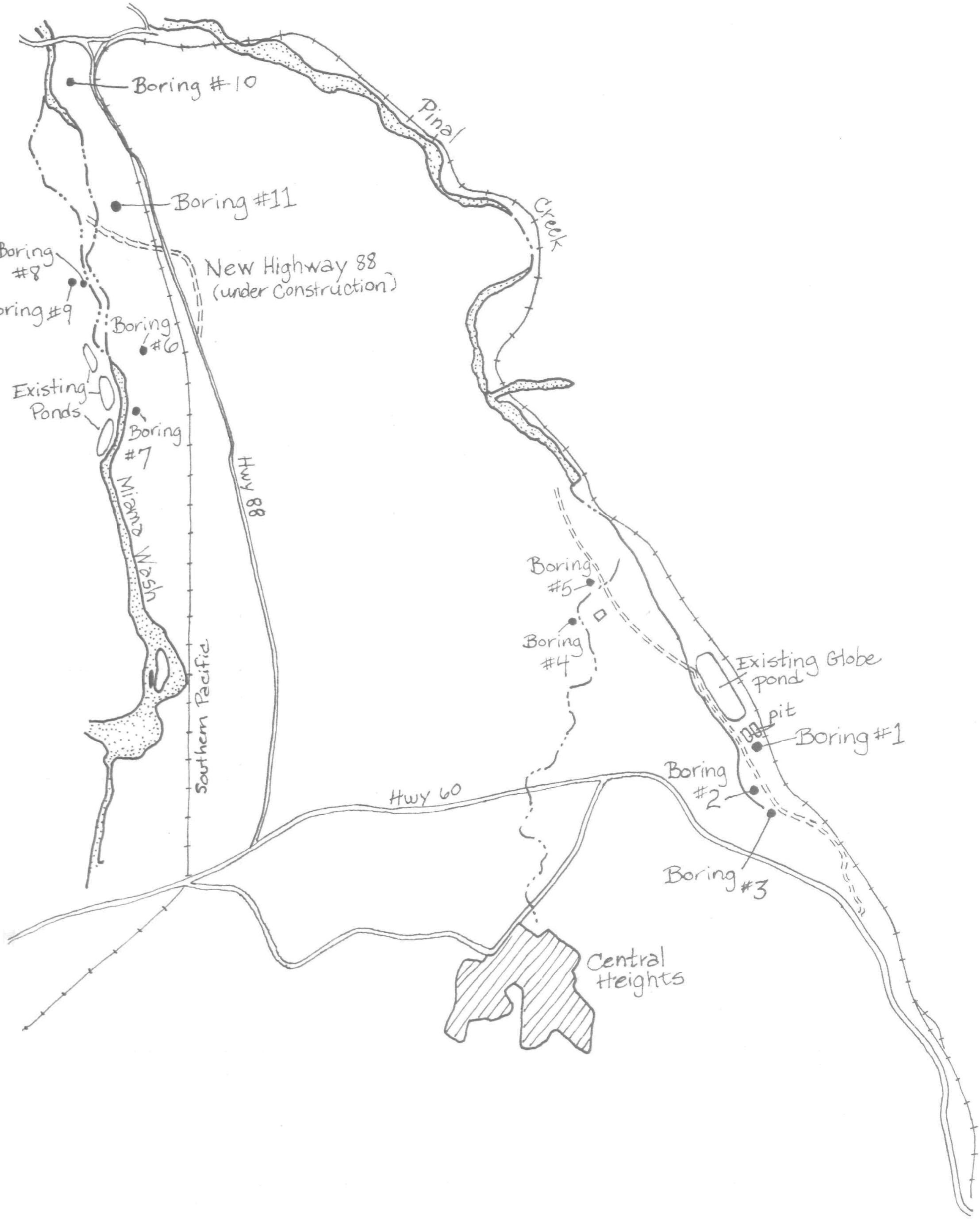
Respectfully submitted,

ENGINEERS TESTING LABORATORIES, INC
Geotechnical Services

John P. Boyd, P. E.

/jm

copies to: Addressee (3)



Location of Test Borings

TABULATION OF TEST RESULTS

Job No. 612-117

Date 3-24-76

Project Percolation Testing Location Globe-Miami

Requested by JPB/ETL Submitted by RCY/ETL

Material Subsurface Soil

HOLE NO.	LOCATION	DEPTH	CLASSIFICATION		LL	PI	SIEVE ANALYSIS — ACCUM % PASSING													
			AASHO	UNIFIED			200	100	40	16	10	4	¼	⅜	¾	1	1½	2	3
1		0-2'	A-2-4	SM	non-plastic		26	63	99	100									
3		15-20'	A-1-a	GW	non-plastic		3	5	13	23	29	35	38	43	65	84	100		
4		10-12'	A-6(3)	SC	30	14	44	51	71	89	95	100							
8		8-10'	A-6(2)	SC	32	15	39	47	61	75	82	90	93	97	100				
8		18-20'	A-2-6	SC	27	12	20	24	35	47	51	60	62	69	86	96	100		
11		8-10'	A-1-b	SM	non-plastic		14	21	36	61	76	91	94	98	100				

ENGINEERS TESTING LABORATORIES, INC.

3737 East Broadway
Phoenix, Arizona 85040
(602) 268-1381

423 S. Olsen Avenue
Tucson, Arizona 85719
(602) 624-8894

2400 E. Industrial
Flagstaff, Arizona 86001
(602) 774-4881

Lab. No. 612-117

Date 3-24-76

Date Rec'd 3-17-76

Project Percolation Testing Location Globe-Miami

Source of Sample Test Borings 1 through 5, Globe Area

Material Subsurface Borings Sampled By RCY/ETL

Submitted By RCY/ETL Requested By JPB/ETL

Tested

TEST RESULTS

Boring No.	Boring Depth (feet)	Water Head During Test (feet)	Measured Drop (Inches)	Time Interval	Percolation Rate in min./inch
1	5	4.5	6	80 sec.	0.22
1	10	9.5	6	40 sec.	0.11
1*	30	could not fill at ±30 gpm discharge			
2	5	4.5	6	110 sec.	0.30
2	10	9.0	12	3 sec.	0.0042
2*	30	could not fill at ±30 gpm discharge			
3*	5	could not fill at ±30 gpm dishcarge			
3*	10	could not fill at ±30 gpm discharge			
3*	30	could not fill at ±30 gpm discharge			
4**	5	4.5	1	6 min.	6.0
4**	10	9.5	3	4 min.	1.33
4	17	16. 5	2	2 min.	1.0
5	5	4.5	2	2 min.	1.0
5	10	9.5	6	4 min.	0.67
5	30	29.5	6	30 sec.	0.08

*Test conducted through center of hollow stem auger.
**Water standing at 3 foot level in 5 foot test hole and 4.5 foot level in 10 foot test hole after ±16 hours (overnight).

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423 S. Olsen Avenue, Tucson, Arizona 85719, (602) 624-8894
2400 E. Industrial, Flagstaff, Arizona 86001, (602) 774-4881

REPORT ON FIELD TESTS

Lab. No. 612-117

Date 3-24-76

Date Rec'd 3-17-76

Project Percolation Testing Location Globe-Miami

Source of Sample Test Borings 6 through 11, Miami Area

Material Subsurface Borings Sampled By RCY/ETL

Submitted By RCY/ETL Requested By JPB/ETL

Tested

TEST RESULTS

Boring No.	Boring Depth (feet)	Water Head During Test (feet)	Measure Drop (inches)	Time Interval	Percolation Rate in min./inch
6	5	4.5	6	15 sec.	0.042
6*	10	could not fill at ±30 gpm discharge			
6	30	not tested below groundwater level			
7*	5	could not fill at ±30 gpm discharge			
7*	10	could not fill at ±30 gpm discharge			
7	30	not tested below groundwater level			
8	5	4.5	4	200 sec.	0.83
8	10	9.5	3	3 min.	1.0
8	30	not tested below groundwater level			
9	5	4.5	1.5	4 min.	2.67
9	10	9.5	3	90 sec.	0.5
9	30	not tested below groundwater level			
10	5	4.5	3	2 min.	0.67
10	10	9.5	3	35 sec.	0.19
10	30	not tested below groundwater level			

 ENGINEERS TESTING LABORATORIES, INC.

*Test conducted through center of hollow stem auger.

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Phoenix, Arizona 85040
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REPORT ON FIELD TESTS

Lab. No. 612-117

Date 3-24-76

Date Rec'd 3-17-76

Project Percolation Testing Location Globe-Miami

Source of Sample Test Borings 6 through 11, Miami Area

Material Subsurface Borings Sampled By RCY/ETL

Submitted By RCY/ETL Requested By JPB/ETL

Tested

TEST RESULTS

Boring No.	Boring Depth (feet)	Water Head During Test (feet)	Measure Drop (inches)	Time Interval	Percolation Rate in min./inch
11*	5	could not fill at ±30 gpm discharge			
11*	10	could not fill at ±30 gpm discharge			
11	30	not tested below groundwater level			

*Test conducted through center of hollow stem auger.

Respectfully submitted,

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ENGINEERS TESTING LABORATORIES, INC.

SOIL CLASSIFICATION ASTM: D2487

COARSE-GRAINED SOIL

MORE THAN 50% LARGER THAN 200 SIEVE SIZE

Symbol	Letter	DESCRIPTION	MAJOR DIVISIONS
	GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% - 200 FINES	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size.
	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% - 200 FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% - 200 FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% - 200 FINES	
	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% - 200 FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size.
	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% - 200 FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES MORE THAN 12% - 200 FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES MORE THAN 12% - 200 FINES	

NOTE — Soils with 5 to 12 percent minus 200 fines should be classified with dual symbols.

FINE-GRAINED SOIL

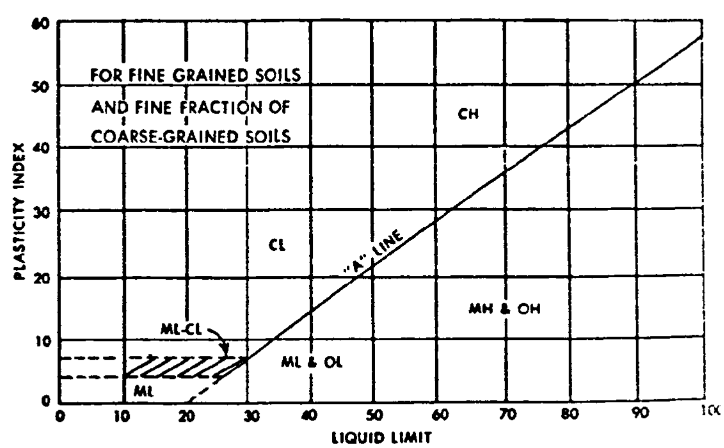
MORE THAN 50% SMALLER THAN 200 SIEVE SIZE

Symbol	Letter	DESCRIPTION	MAJOR DIVISIONS
	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	SILTS AND CLAYS Liquid limit less than 50
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	SILTS AND CLAYS Liquid limit greater than 50
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

SOIL FRACTIONS

Component	Size Range
Boulders	Above 12 in.
Cobbles	3 in. to 12 in.
Gravel	3 in. to No. 4 sieve
Coarse Gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

PLASTICITY CHART



DEFINITIONS

Penetration Resistance — Blows per foot using 'A' rod and 140 lb. hammer with 30 inch free fall unless otherwise noted.

N Standard Penetration Resistance (ASTM:D1586), 2.0 inch O.D. split barrel sampler.

C Continuous Penetration Resistance, 2.0 inch O.D. Bull Nose.

R Penetration Resistance, 2.42 inch I.D. Ring Sampler

Sample Type

R - Ring T - Shelby Tube S - Standard Split Barrel B - Block
G - Grab C - Cutting V - Vertical Face Cut

Particle Size Distribution

Percentage shown on log denotes visual approximation ±5%.

Soil Classification

Visual unless accompanied by mechanical analysis and Atterberg limits.

Depth ft	Penetration resistance blows/ft C	N	Sample type	Dry density pcf	Moisture content	Graphical log	Description	Soil classification	Max size in	Boulders	Cobbles	Gravel	Sand	Silt & clay	Gradation (Well / Med / Poor)	Grain shape (Angular / Subangular / Rounded / Subrounded)	Relative density (Low / Medium / High)	Dry strength (None / Very low / Low / Medium / High / Very high)	Plasticity (None / Low / Medium / High)	Consistency (Soft / Firm / Stiff / Very stiff / Hard)	Cementation (None / Weak / Medium / Strong)
1					dry		SILTY SAND; Light Brown	SM	#40				80	20	x (Poor)	x (Subangular) x (Subrounded)	xx (Low, Medium)		x (None)		x (None)
2			C		to		Medium to fine sand.														
3					slightly																
4					damp																
11					Slightly		GRAVELLY SAND TO SANDY	SM													
12					damp		GRAVEL; Brown	to	1½"			30	55	15							
13							Stratified, silty, non-	GM			to	45	40	15	xx (Med, Poor)	x (Subangular) x (Subrounded)	x (Medium)		xx (None, Low)		x (None)
14							plastic to very low														
15							plasticity.														
16		271																			
22			C																		
32							Stopped @ 30'														
33							No Groundwater														

FIELD ENGINEER RCY

DRILLER LP HELPER DP **SOIL BORING DATA** SIZE OF HOLE 7" TYPE OF DRILL CME

ELEV. BORING 2 PROJECT Perc. Testing-Globe/Miami DATE 3-15-76 JOB NO. 612-117

DEPTH FT	PENETRATION RESISTANCE BLOWS/FT. C	N	SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	GRAPHICAL LOG	DESCRIPTION	SOIL CLASSIFICATION	MAX SIZE, IN	PARTICLE SIZE DISTRIBUTION % BOULDERS	COBBLES	GRAVEL	SAND	SILT & CLAY	GRADATION (WELL / MED / POOR)	GRAIN SHAPE (ANGULAR / SUBANGULAR / ROUNDED / SUBROUNDED)	RELATIVE DENSITY (LOW / MEDIUM / HIGH)	DRY STRENGTH (NONE / VERY LOW / LOW / MEDIUM / HIGH / VERY HIGH)	PLASTICITY (NONE / LOW / MEDIUM / HIGH)	CONSISTENCY (SOFT / FIRM / STIFF / VERY STIFF / HARD)	CEMENTATION (NONE / WEAK / MEDIUM / STRONG)
1																					
2					Slightly		GRAVELLY SAND TO SANDY	SM	8"		10	40	40	10							
3					damp		GRAVEL; Brown	to	to		to										
4							Stratified, some silt,	GM	1½"			20	65	15	xx	x x	x		xx		x
5							non-plastic to very low														
6							plasticity, some cobbles														
7							and considerable gravel														
8							0-5', sands predominant														
9							below 5'.														
10																					
1																					
2																					
3																					
4																					
5																					
6		272																			
7																					
8																					
9																					
20																					
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
30																					
1																					
2							Stopped @ 30'														
3							No Groundwater														
4																					
5																					
6																					
7																					
8																					
9																					

HELPER DF　　SOIL BORING DATA　SIZE OF HOLE 7"　TYPE OF DRILL CME

ELEV.　BORING 3　PROJECT Perc. Testing-Globe/Miami　DATE 3-15-76　JOB NO. 612-117

DEPTH FT	PENETRATION RESISTANCE BLOWS/FT C	N	SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	GRAPHICAL LOG	DESCRIPTION	SOIL CLASSIFICATION	MAX SIZE IN	BOULDERS	COBBLES	GRAVEL	SAND	SILT & CLAY	GRADATION (WELL / MED / POOR)	GRAIN SHAPE (ANGULAR / SUBANGULAR / ROUNDED / SUBROUNDED)	RELATIVE DENSITY (LOW / MEDIUM / HIGH)	DRY STRENGTH (NONE / VERY LOW / LOW / MEDIUM / HIGH / VERY HIGH)	PLASTICITY (NONE / LOW / MEDIUM / HIGH)	CONSISTENCY (SOFT / FIRM / STIFF / VERY STIFF / HARD)	CEMENTATION (NONE / WEAK / MEDIUM / STRONG)
1																					
2					Slightly		SANDY GRAVEL w/occasional														
3					damp		sand lenses, some cobbles,														
4							stratified, traces silt	GP	5"		10	50	35	5							
5							fines.	to							xx	x x	xx		x		x
6								GM		to		40	50	10							
7																					
8																					
9																					
10																					
1																					
2																					
3																					
4																					
5																					
6		273																			
7																					
8			C																		
9																					
20																					
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
30																					
1																					
2							Stopped @ 30'														
3							No Groundwater														
4																					
5																					
6																					
7																					
8																					
9																					
0																					

FIELD ENGINEER RCY

DRILLER LP HELPER DP **SOIL BORING DATA** SIZE OF HOLE 7" TYPE OF DRILL CME

ELEV. BORING 4 PROJECT Perc. Testing-Globe/Miami DATE 3-15-76 JOB NO. 612-117

DEPTH FT	Penetration Resistance Blows/FT C	N	Sample Type	Dry Density PCF	Moisture Content	Graphical Log	DESCRIPTION	Soil Classification	Max Size, In	Boulders	Cobbles	Gravel	Sand	Silt & Clay	Gradation (Well / Med / Poor)	Grain Shape (Angular / Subangular / Rounded / Subrounded)	Relative Density (Low / Medium / High)	Dry Strength (None / Very Low / Low / Medium / High / Very High)	Plasticity (None / Low / Medium / High)	Consistency (Soft / Firm / Stiff / Very Stiff / Hard)	Cementation (None / Weak / Medium / Strong)
1					-PL		CLAYEY SAND; Brown	SC	#4				60	40	Poor: x	Subangular: x; Subrounded: x	Low: x		Medium: x	Firm: x	None: x
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10							SANDY CLAY TO CLAYEY						60	40							
1			C		near PL		SAND; Brown	CL-				to	40	10	Poor: x	Subangular: x; Subrounded: x		Medium: x	Medium: x	Firm: x	None: x
2							Clays predominant w/some	SC													
3							sandy lenses.														
4																					
5		274																			
6																					
7																					
8																					
9																					
20							Refusal on rock formation														
1							@ 18'														
2							No Groundwater														
3																					
4																					
5																					
6																					
7																					
8																					
9																					
30																					
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
0																					

DEPTH FT	PENETRATION RESISTANCE BLOWS/FT.		SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	GRAPHICAL LOG	DESCRIPTION	SOIL CLASSIFICATION	MAX SIZE. IN	PARTICLE SIZE DISTRIBUTION %					GRADATION			GRAIN SHAPE				RELATIVE DENSITY			DRY STRENGTH						PLASTICITY				CONSISTENCY					CEMENTATION			
	C	N								BOULDERS	COBBLES	GRAVEL	SAND	SILT & CLAY	WELL	MED	POOR	ANGULAR	SUBANGULAR	ROUNDED	SUBROUNDED	LOW	MEDIUM	HIGH	NONE	VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH	NONE	LOW	MEDIUM	HIGH	SOFT	FIRM	STIFF	VERY STIFF	HARD	NONE	WEAK	MEDIUM	STRONG
1					-PL		CLAYEY SAND; Brown	SC	#4				60	40			x		x		x		x										x			x				x			
2																																											
3																																											
4			C																																								
5																																											
6																																											
7																																											
8																																											
9																																											
10																																											
1							SAND with silt and																																				
2							gravel traces; Brown,	SP-																																			
3							Stratified, medium to	SM	3/4"				90	10																													
4							coarse sand predominant.					to																														
5		275											85	15		x			x		x		x								x									x			
6																																											
7					Slightly																																						
8					damp																																						
9																																											
20																																											
1																																											
2																																											
3																																											
4																																											
5																																											
6																																											
7					Slightly																																						
8					damp		SANDY GRAVEL w/silt	GP-				50	40	10		x			x		x		x								x									x			
9							traces; Brown	GM																																			
30																																											
1																																											
2							Stopped @ 30'																																				
3							No Groundwater																																				
4																																											
5																																											
6																																											
7																																											
8																																											
9																																											
0																																											

FIELD ENGINEER RCY

DRILLER LP HELPER DP

SOIL BORING DATA

SIZE OF HOLE 7" TYPE OF DRILL CME

ELEV. BORING 6 PROJECT Perc. Testing-Globe/Miami DATE 3-16-76 JOB NO. 612-117

DEPTH FT	PENETRATION RESISTANCE BLOWS/FT. C	N	SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	GRAPHICAL LOG	DESCRIPTION	SOIL CLASSIFICATION	MAX SIZE, IN	PARTICLE SIZE DISTRIBUTION % BOULDERS	COBBLES	GRAVEL	SAND	SILT & CLAY
1					-PL		CLAYEY SAND; Brown	SC	#4				60	40
2														
3														
4														
5														
6					Slightly		SAND w/silt and gravel	SP-	½"			10	80	10
7					damp		traces, stratified,	SM						
8							medium to coarse sand							
9							predominant.							
10														
1														
2					to									
3														
4														
5					damp									
6		276												
7														
8														
9														
20														
1														
2														
3														
4														
5														
6														
7														
8														
9														
30														
1														
2							Stopped @ 30'							
3							Groundwater @ 20'							
4							3-16-76 @ 11:00 a.m.							
5														
6														
7														
8														
9														
0														

DEPTH FT	GRADATION WELL	MED	POOR	GRAIN SHAPE ANGULAR	SUBANGULAR	ROUNDED	SUBROUNDED	RELATIVE DENSITY LOW	MEDIUM	HIGH	DRY STRENGTH NONE	VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH	PLASTICITY NONE	LOW	MEDIUM	HIGH	CONSISTENCY SOFT	FIRM	STIFF	VERY STIFF	HARD	CEMENTATION NONE	WEAK	MEDIUM	STRONG
1			x		x		x		x										x			x				x			
6		x			x		x		x								x									x			

ELEV. BORING 7 PROJECT Perc. Testing-Globe/Miami DATE 3-16-76 JOB NO 612-117

DEPTH FT	PENETRATION RESISTANCE BLOWS/FT. C	N	SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	GRAPHICAL LOG	DESCRIPTION	SOIL CLASSIFICATION	MAX SIZE, IN	BOULDERS	COBBLES	GRAVEL	SAND	SILT & CLAY	GRADATION	GRAIN SHAPE	RELATIVE DENSITY	DRY STRENGTH	PLASTICITY	CONSISTENCY	CEMENTATION
1					Slightly																
2					damp		SAND w/silt and gravel	SP-													
3							traces; Brown	SM	½"			10	80	10	MED	SUBANGULAR, SUBROUNDED	MEDIUM		NONE		NONE
4							Stratified deposits,														
5							medium to coarse sands														
6							predominant.														
7																					
8																					
9																					
10																					
1																					
2																					
3					to																
4																					
5																					
6		277																			
7																					
8																					
9																					
20																					
1					damp																
2																					
3					▽																
4																					
5																					
6																					
7																					
8																					
9																					
30																					
1																					
2							Stopped @ 30'														
3							Groundwater @ 23'														
4							3-16-76 @ 12:00 p.m.														
5																					
6																					
7																					
8																					
9																					
0																					

FIELD ENGINEER RCY

DRILLER LP HELPER DP

SOIL BORING DATA

SIZE OF HOLE 7" TYPE OF DRILL CME

ELEV. BORING 8 PROJECT Perc. Testing-Miami/Globe DATE 3-16-76 JOB NO. 612-117

DEPTH	PENETRATION RESISTANCE BLOWS/FT. C	N	SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	GRAPHICAL LOG	DESCRIPTION	SOIL CLASSIFICATION	MAX SIZE, IN	BOULDERS	COBBLES	GRAVEL	SAND	SILT & CLAY	GRADATION (WELL / MED / POOR)	GRAIN SHAPE (ANGULAR / SUBANGULAR / ROUNDED / SUBROUNDED)	RELATIVE DENSITY (LOW / MEDIUM / HIGH)	DRY STRENGTH (NONE / VERY LOW / LOW / MEDIUM / HIGH / VERY HIGH)	PLASTICITY (NONE / LOW / MEDIUM / HIGH)	CONSISTENCY (SOFT / FIRM / STIFF / VERY STIFF / HARD)	CEMENTATION (NONE / WEAK / MEDIUM / STRONG)
1					Slightly		SAND w/silt and gravel	SP-													
2					damp		traces; Brown	SM	1"			10	75	15	x	x x	x		x		x
6							SANDY CLAY TO CLAYEY	CL	3/4"			tr	40	60							
7					-PL		SAND w/gravel traces;				to		60	40	x	x x		xx	x	x	x
8							Brown														
10			C																		
15							CLAYEY GRAVELLY SAND;														
16		278			Slightly		Brown; stratified, medium					20	60	20							
17					damp		to fine sand.	SC	1½"		to	40	50	10	x	x x			xx		x
18					to																
19					damp																
20			C																		
31							Stopped @ 30'														
32							Groundwater @ 22'														
33							3-16-76 @ 4:30 p.m.														

ELEV. BORING 9 PROJECT Perc. Testing-Miami/Globe DATE 3-16-76 JOB NO. 512-117

DEPTH FT	Penetration Resistance Blows/Ft. C	N	Sample Type	Dry Density PCF	Moisture Content	Graphical Log	DESCRIPTION	Soil Classification	Max Size, In	Boulders	Cobbles	Gravel	Sand	Silt & Clay	Gradation: Well	Med	Poor	Grain Shape: Angular	Subangular	Rounded	Subrounded	Relative Density: Low	Medium	High	Dry Strength	Plasticity: None	Low	Medium	High	Consistency	Cementation: None	Weak	Medium	Strong
1					Slightly		SAND w/silt and gravel	SP-																										
2					damp		traces.	SM	½"			10	80	10		x			x		x		x			x					x			
6					Slightly		CLAYEY GRAVELLY SAND;																											
7					damp		Brown	SC	1½"			20	60	20																				
8							Stratified, medium to				to	40	50	10		x			x		x						x	x			x			
9							fine sand.																											
10					to																													
13					damp																													
16–17		279																																
20					∇																													
32							Stopped @ 30'																											
33							Groundwater @ 20'																											
34							3-16-76 @ 4:00 p.m.																											

SHEET OF

FIELD ENGINEER RCY

DRILLER LP HELPER DP

SOIL BORING DATA

SIZE OF HOLE 7" TYPE OF DRILL CME

ELEV. BORING 10 PROJECT Perc. Testing-Miami/Globe DATE 3-16-76 JOB NO. 612-117

DEPTH FT	Penetration Resistance Blows/Ft. C	N	Sample Type	Dry Density PCF	Moisture Content	Graphical Log	Description	Soil Classification	Max Size, In	Boulders	Cobbles	Gravel	Sand	Silt & Clay
1					-PL									
2							SILTY SAND AND CLAY;	SC-						
3							Brown, Micaceous.	CL	#10				60	40
4													40	60
5			C											
6														
7														
8							SAND w/silt and gravel	SP-						
9					Slightly		traces; Brown	SM	2"			10	80	10
10					damp		Stratified deposits,							
1							medium to coarse sands							
2							predominant, some minor							
3					to		clay lenses below 18'.							
4					damp									
5														
6		280												
7														
8														
9														
20														
1														
2					▽									
3														
4														
5														
6														
7														
8														
9														
30														
1														
2							Stopped @ 30'							
3							Groundwater @ 21.5'							
4							3-16-75 @ 10:30 a.m.							
5														
6														
7														
8														
9														

DEPTH FT	Gradation			Grain Shape				Relative Density			Dry Strength						Plasticity				Consistency					Cementation			
	Well	Med	Poor	Angular	Subangular	Rounded	Subrounded	Low	Medium	High	None	Very Low	Low	Medium	High	Very High	None	Low	Medium	High	Soft	Firm	Stiff	Very Stiff	Hard	None	Weak	Medium	Strong
3			x		x		x		x				x					x				x				x			
10		x			x		x		x								x									x			

ELEV. BORING 11 PROJECT Perc. Testing-Miami/Globe DATE 3-16-76 JOB NO. 612-117

Depth FT	Penetration Resistance Blows/FT: C	N	Sample Type	Dry Density PCF	Moisture Content	Graphical Log	Description	Soil Classification	Max Size, In	Boulders	Cobbles	Gravel	Sand	Silt & Clay	Gradation: Well	Med	Poor	Grain Shape: Angular	Subangular	Rounded	Subrounded	Relative Density: Low	Medium	High	Dry Strength: None	Very Low	Low	Medium	High	Very High	Plasticity: None	Low	Medium	High	Consistency: Soft	Firm	Stiff	Very Stiff	Hard	Cementation: None	Weak	Medium	Strong
1					Slightly																																							
2					damp		SAND with silt and gravel																																					
3							traces; Brown																																					
4							Stratified deposits, medium																																					
5							to coarse sands predominant.																																					
7								SP-																																				
8					to			SM	1"			10	80	10		x			x		x		x								x									x			
9			C																																									
13					damp																																							
16		281																																										
18					▽																																							

Stopped @ 30'
Groundwater @ 18'
3-16-76 @ 9:00 a.m.

SHEET OF

APPENDIX S

TRANSCRIPT OF PUBLIC HEARINGS

U.S. ENVIRONMENTAL PROTECTION AGENCY HEARING

In Re:

U.S. ENVIRONMENTAL PROTECTION AGENCY

-and-

GREATER GLOBE-MIAMI WASTEWATER TREATMENT PROJECT

No.

Globe, Arizona
Wednesday, February 18, 1976
1:30 P.M.

TRANSCRIPT OF PROCEEDINGS

POTTER, SPICER & WARMUTH
Court Reporters – Deposition Notaries
22 Luhrs Arcade
Phoenix, Arizona 85003
257-1593

I N D E X

THE U. S. ENVIRONMENTAL PROTECTION AGENCY HEARING,taken at 1:30 p.m., at the City Hall, Council Room, 150 North Pine Street, Glove, Arizona, before KAREN K. HEUTZENROEDER, Certified Shorthand Reporter.

Representing the U. S. Environmental Protection Agency, Region 9:

MR. MATTHEW S. WALKER, Hearing Officer

MR. GEORGE TERAMOTO, Team Leader, Nevada, Arizona, and Central California Section, Instruction Grants Review Team of the Water Division.

MR. RICK McLOUD, Environmental Engineer, Construction Crants Branch, Water Division.

WHEREUPON, the following proceedings were held:

POTTER, SPICER & WARMUTH
PHOENIX, ARIZONA
257-1593

MATTHEW S. WALKER

Good afternoon, ladies and gentlemen.

We will now declare this public hearing open.

My name is Matthew S. Walker, and I am Hearing Officer for E.P.A. Region 9. This hearing is called by the United States Environmental Protection Agency, Region No. 9, for the purpose of considering a Draft Environmental Impact Statement for the Greater Globe-Miami Wastewater Treatment Project.

The National Environmental Policy Act of 1969, which is Public Law No. 91-190, also known as NEPA, requires a detailed statement to be made on any recommendation or report of any major federal action.

The Federal Water Pollution Control Act, which is Public Law No. 92-500, requires the Administrator of the Environmental Protection Agency to encourage waste treatment management that results in a desirable environment to the extent practicable and to be on an area-wide basis.

To quote a Federal Regulation; requires that the environmental impact be assessed in a statement pursuant to those regulations.

On October 28th, 1975, the Regional

Administrator of E.P.A. Region 9 publicly announced the intention of the E.P.A. to prepare an Environmental Impact Statement in compliance with the National Environmental Policy Act and the Federal Water Pollution Control Act on the proposed Agency action to make grants available for the unknown disposal system of the greater Globe-Miami Wastewater Treatment Project.

A draft Environmental Impact Statement was circulated for comment on the 12th of January, 1976, and this hearing has been called to consider that Draft.

Public notice for the hearing was published in the Federal Register and also published in the Arizona Silver Belt on the 15th of January, 1976.

As to the procedure to be followed at this hearing, this is not an adjudicatory hearing or an adverse type hearing in the sense that we are taking testimony under oath subject to cross examination. It is informational. We are here to receive comments from the public so that they may be considered before any final agency decisions on this project are made.

If there are any questions, I request that they be addressed to the chair rather than to the speaker, so that the hearing can go forward as expeditiously as possible.

After the opening presentation, we have a procedure that gives everyone an opportunity to be heard without giving precedence to any particular group.

There are registration cards at the back of the hall that look like this, and the young lady at the door will hand you one. You can fill out your name and address and whom you represent. We request that you do register. It is, of course, not required. This is a public meeting and anybody can come, anonymously if you wish, but if you do wish to make a presentation, I request that you fill out one of these cards and indicate in the box that says yes on the card that you do have a presentation to make.

All persons who intend to make a statement and who have registered, will be called as nearly as possible in the order they have signed up.

The cards will be sorted into five groupings; within each grouping the people will be called in order. The groupings are, first of all, elected officials who will be given precedence; then unaffiliated private citizens; representatives

of public agencies; representatives of special interest groups and associations; representatives of business, commercial or industrial firms.

The speakers will be called in the following manner: elected representatives will be given preferential treatment. Others will be called by selecting a card from one of the other groups in rotation. If one of the groups of cards is substantially larger than the other groups, two or more cards may be selected from that group before going on to the next group. Prior appointments will not be accepted.

Now, the gentleman on my immediate right is Mr. George Teramoto, Team Leader, Nevada, Arizona and Central California Section, Instruction Grants Review Team of the Water Division, E.P.A. Region 9.

On my left is Mr. Rick McLoud, Environmental Engineer, Construction Grants Branch, Water Division, E.P.A. Region 9. Mr. McLoud will have some opening remarks and then we will hear from the public.

We have received some correspondence with regard to this hearing. All of this correspondence will be placed in the file and will be considered as part of the public record. It isn't necessary for you to repeat it here; we

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will consider it just as much if you repeated it here at length as for those who have written speeches. We will listen to you, of course. If you have lengthy remarks and you do wish to submit them in writing, you will be given every bit as much consideration as if you read them at length, and this gives time to others to speak.

About midway through the afternoon, we will call a recess. This is customary to give the court reporter a break; and during that period, resource people from the E.P.A. will be available for a question and answer period. However, that will be off the record; it will not be part of the formal transcribed proceedings. If you have something to say that you want to be sure is on the record, you should make it part of the record so that it will be transcribed and be a part of the comments.

The proceedings are being recorded by a Certified Shorthand Reporter, Karen Houtzenroeder of the firm of Potter, Spicer & Warmuth; and a copy of these proceedings will be available in the regional office shortly after the conclusion of the hearing. Anybody who wants a copy for their own use should make individual arrangements with the court reporter.

This is the first of a two session hearing. We are going to continue the hearing tonight at 7:30 in the same place. It will not be necessary to repeat tonight whatever you have said here today, because it is going to be a continuous record.

And now, I will call on Mr. McLoud for some opening remarks and then we will hear from the public.

RICK McLOUD

I would like to say good afternoon to everybody.

The statement I would like to read is as follows:

The Environmental Protection Agency has written an Environmental Impact Statement on the Globe-Miami Regional Sewer Project to try to resolve the public controversy that arose from the previous project.

A complete list of all various alternatives has been attempted. The recommended project as outlined in the Impact Statement includes a gravity fed regional sewage treatment system including an aerated lagoon and percolation ponds located north of the Wheatfields area. It is estimated to cost nearly three and a half million dollars.

The E.P.A. has expressed its preliminary opinion of the best solution to the water quality problems of this area, and now we ask you for yours. Every comment received here today or in the near future by mail as mentioned by Mr. Walker will be included and answered by the E.P.A. in the final Environmental Impact Statement. Also, the final Impact Statement will contain the E.P.A.'s final decision about the Globe-Miami project.

Our target date for distribution of the final Impact Statement is the 1st of April. This project is complex and a lot of money is involved. It is important for people to get involved and share their opinions with us. The E.P.A. is hoping for a new spirit of cooperation among those involved so that this project can become a reality as soon as possible.

I thank you.

MR. WALKER: The first card I have in accordance with the announced procedure is Miss Katie Weimer, Mayor of the Town of Miami.

MS. WEIMER: Right here?

MR. WALKER: Yes. We notice here that it's a

little bit difficult for us to see people if you're sitting, so if you don't mind, we would like to watch you and perhaps you would like to watch us during the hearing.

MS. WEIMER: Is this hooked up?

MR. WALKER: I think it is. There's a little slide on the top that should go forward to make sure it's working.

MS. WEIMER: It's going forward.

MR. McLOUD: It sounds like it's on.

KATIE WEIMER

I am Katie Weimer, Mayor of the Town of Miami; and I'm here to tell the Hearing Board that since you have okayed the lagoons in your Environmental Impact Statement, our lagoons are working and seem to be in good order; and we have reviewed your statement and we feel like that if all lagoons are updated to meet your requirements that it would be better for us than to have to go to the 11 miles further down, because we -- at this time we cannot afford it and we can't afford to carry the ball for the outlying communities, which it seems like the Environmental people think that the City of Globe and the Town of Miami should share in the expense, and there's -- there are

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257-1593

more people in outlying areas than in the corporate city limits of both towns.

So, I would like your Board to review the situation and I certainly want them to take into consideration the fact that we do have aerated lagoons and they seem to be percolating very well as they are; and I thank you.

MR. WALKER: Thank you.

Mayor, Mr. Teramoto has a question for you.

MR. TERAMOTO: If the unincorporated areas should bear their share of the cost, would Miami be able to enter this regional system?

MS. WEIMER: Well, Mr. Teramoto, I -- we feel like that it would be a community -- it should be a community-wide thing, but having been involved in this situation for such a long time and having contact with our supervisors, I, I see no hope for the outlying areas to come into this at this time; and the Town of Miami has a deadline which we have to meet and we've, we've had cease and desist orders that will come into effect, I think by 1977, and I see no way that we could get the outlying areas in unless they do start to have some sanitary districts formed, and there has not been a thing done with the outlying areas.

The only one is, I think, the Cobre Valley -- I mean, Central Heights. They have a district formed and they're the only one that have indicated that they would like to come in.

MR. TERAMOTO: Thank you.

MR. WALKER: Mr. George Larson, Councilman of the City of Globe.

GEORGE LARSON

My name is George Larson. I'm Councilman of the City of Globe, and I live at 691 Monroe Street in Globe.

I have been involved in this sewer situation since about 1971. We had a mass meeting at Miami High School. As I remember, there was 81 people there, representatives from most all the districts, and we all got the impact of what it was going to cost by Carollo Engineers, and we left there feeling like we might do something. Ever since then, at least the City of Globe and the City of Miami, have had many, many meetings, and we haven't accomplished anything at all.

So, finally it came to the situation of pressure on us by the State Health Department, and the City of Globe started out themselves.

After we got a mile-and-a-half of what

we call phase 1 in, we got a court order to stop. We went to court, we won this, we had a contract left for phase 3, which is a water treatment plant. We had a lot of money and time involved in this, and then they -- E.P.A. was contacted and we got an order to stop that.

Since then we've been trying to get what we call phase 2, which is a line on up to the forks of the road at Ice House, which we haven't done. We haven't got the money, we've had a bond issued trying to get this situation going.

I have here a survey of Ice House Canyon, and I represent those people up there, and other than about 12 or 15, everyone that can get on the north -- Highway 70, is on the sewer line.

These other people, there's no chance in the world they've got to go down, and I've come here to ask you people if we're going to go into any more phases, to put phase 4 and put a trunk line in up behind so these people can get on at a reasonable price. Otherwise, those people are pumping septic tanks as much as twice a month. In fact, several people are doing that, and they're suffering, and I see no, no out for them.

People in Globe, in articles in the paper, are asked, "Are you in favor of Globe

growing?" How can we grow when we haven't got any sewer system?

I made my mind up after about five years of going to every meeting that was in this town, and, you people, I've met with you several times and we've got nowhere.

What I'm asking is for us to use our lagoon down there for you to add on phase 4 to help those people up -- possibly a hundred homes -- up back south of Globe, south and east, and we'll keep this.

We've been down cleaning this lagoon out; we got a boat down there; we drag cattails and things out of there, and that's the best I know we can do. I gave up.

I don't think you will ever have anything down below because you're not going to get these people to work with you, and if you won't give us the go-ahead, I guess we'll just have to let ours run down the creek too. That's the way I feel about it.

MR. WALKER: Any questions?

MR. TERAMOTO: Are you going to make that an exhibit?

MR. WALKER: Do you have a copy of your remark to make as an exhibit?

MR. LARSON: No. No, but I can give you one. That's the survey of Skyline.

MR. McLOUD: I haven't seen that.

MR. LARSON: Well, that's what Carollo did for us, and I have another. I'd like for you to look at it, and we have quite a few pieces of Skyline on the sewer line going down 70, but we've got nothing at all over on the other side; and those people are suffering and they are wanting help and we aren't getting any. That's the way the situation is.

I happen to be the representative of these people, and everyone else is on the sewer line, most of them. Of course, there are some septic tanks, but septic is not working here. There are so many contaminated places in this county and I know people know it. I don't know what you're going to do about it, but the City of Globe has put out an awful lot of effort and they've got a lot money tied up in this, and it's buried down there in the creek, as you know, and you people stopped this. We would have that in effect right today were it not for the lawsuits and the Environmental people.

Thank you.

MR. McLOUD: Thank you.

MR. TERAMOTO: I would like to ask the same question: If this regional system goes through and everyone pays their proportionate share, including the people in the unincorporated areas, would Globe be willing to enter this region?

MR. LARSON: I'm sure they will. The situation right now is the fact that Globe has quite a bit of money invested down there in nothing, and we had a bond issue here -- we lost by six votes -- for water and sewer, and there's no use us having another bond issue with the situation the way it's running now, because that would be throwing another bunch of money away.

We've got to have the cooperation of the whole district, or I'm asking for this phase -- add phase 4 onto this Skyline situation and give those people up there that are willing to go a break, and we can run down to the lagoon until something else happens.

Thank you.

MR. TERAMOTO: Thank you.

MR. WALKER: All right, we have a copy of the report which will be marked in evidence. Since that's going to be Exhibit No. 5, I'd better go through the first exhibits at this time.

I have a Notice of Public Hearing by

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the U. S. Environmental Protection Agency, which will be Exhibit 1.

I have the Affidavit of Publication of the Notice of Hearing from the Arizona Republic stating that it was published on January the 23rd, 1976. That will be Exhibit 2.

I have the Affidavit of Publication from the Arizona Silver Belt indicating that it was published; and the Notice of Hearing was published in that newspaper on the 15th of January, 1976. That will be Exhibit 3.

The press release issued by the Environmental Protection Agency, Region 9, will be Exhibit 4;

And then the report that's just been referred to by John Carollo Engineers, dated March 14th, 1975, and entitled Sewer System Report, 1975, Skyline Area, City of Globe, Globe Arizona, will be Exhibit 5.

I will now call on Miss Eva Marie Setka.

EVA MARIE SETKA

My name is Eva Marie Setka, S-e-t-k-a, not S-i-t-k-a as in the E.P.A. book and newspaper articles.

I live within one-half mile of Site 3,

the proposed site recommended in the book.

According to the study, a petition containing about 300 names was presented to the County Board of Supervisors protesting any site in the Wheatfields area. We, the Setka family, are among the 300 as we really live in Wheatfields many of the other people do not.

In the study are various false statements:

One, discussions with property owners in the lower Wheatfields area. We were never contacted in any time. We are and have been property owners in the Wheatfields area since the 20's. At no time was anything said to us, and no book was sent, brought or given to us. We are also property owners in Globe.

How come the man who worked on this long, long wonderful book never talked to us? We never saw them once.

Two, that one residence is located about one-half mile and across the road from the site. We are on the same side as the site; there are several families living in the area.

Three, Site 3 is recommended because it achieves the widest regional benefits without disruptive environmental, social or monetary impacts.

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How does this figure?

Four, it would be adverse, unfavorable, detrimental or harmful to man and nature in Site 1, but it would be beneficial, advantageous or promote health and well being for man or nature at Site 3.

Five, In the section between Globe and Pringle surface flows only occurs -- surface flow only occurs following rain or snowmelt in the vicinity of Pringle, rather than the flow forms a perennial stream. That's not true because the water runs right past our place.

We wish it to go on record that we are opposed to Site 3 plan, and any and every other plan in our area.

Thank you.

MR. WALKER: Thank you, Mrs. Setka.

Any questions?

MR. TERAMOTO: No.

MRS. SETKA: I guess not.

MR. McLOUD: Did you get a copy of the report today?

MRS. SETKA: Yes, sir, thanks to this lady.

MR. WALKER: The next card I have, I'm not sure I can read: Luis C. Aguirre.

///

LUIS C. AGUIRRE

My name is Luis Aguirre. I'm a Councilman here for the City of Globe, and after hearing Mrs. Setka, that is probably one of the biggest problems we have had. Our public relations in linking this whole program has been nil.

This program originally when it started was a Globe-Miami wastewater project. It was going to be a metropolitan sewer system.

I went along with it from the start because I thought that everything was going to be handled through proper channels. As the program progressed along, I found out that a lot of people weren't contacted, like Mrs. Setka, Mr. Bixby, Dr. McDonald, and the City of Globe kept going on forward.

Well, I finally made up my mind that we should stop it, and I'm thankful to you people that you did for the City of Globe taxpayers.

The City of Miami and the County Supervisors decided there wasn't enough information for them to go along, and I give them credit for it. They stopped it immediately. Thay haven't come into it simply because of the reason that everything wasn't presented from the start when it was first started here.

We have a report from John Carollo engineers. We were told at the time by former Mayor Rabogliatti that we had the money. We had the money in the bank to complete the whole project. That's as far as the City of Globe was concerned. That's the only reason I went along with it, because it was a good idea and we did have the money. As it turned out, they decided that we were going along with it, and I went along with it because I still thought that there was a probability that the other entities would come into it, which was seven entities, seven districts -- sanitary districts.

After I started studying the John Carollo's report and looking at the figures that he presented to us in the report for the intercepter line and for the sewer treatment plants, and that's the only thing that Globe needed, nothing more. We have our sewer sanitation district already. We have our arterial lines, and all we needed was the intercepter line and a sewage treatment plant, but in his figures it would cost the City of Globe $233,000.00 to complete that project. Of course, those figures were made up in 1972. To this date we have already spent -- my latest figures -- about

$962,000.00 including federal money, which is tax dollars coming out of my pocket and everybody's pocket; and what do we have, actually have? We have nothing. We have a sewer line down there outside the city limits and it isn't going to do us any good because you people cannot push the other entities into coming in with us. There's no way possible, and the City of Miami and the County Supervisors were wise for not coming in.

They weren't consulted, they weren't brought in and told all the facts. Just like I wasn't told all the facts.

I have a map here that I want to bring out, and this concerns the City of Globe taxpayers. It's proposed improvements by sewer improvement district, Globe area.

I would like to ask Mr. John Carollo why we had to go to an improvement district. We didn't have to. We had all arterial lines. All we needed was the intercepter lines and the sewage treatment plant. That's all we needed.

Here's another thing: Here you have your sewer improvement district in the Globe area. It takes in Skyline, it takes in south Skyline, it takes in all the ares that Mr. Larson is worried about, and I sympathize with you. I think the City of Globe should have gone ahead and made those and had them in.

From here on down, from Ash Street, there's no improvements at all, and yet all this part of town was going to be forced into paying for the improvement districts of this side of town, of this side of the area; and this is mostly in the county.

Now, why weren't we informed of all of this?

Now, for two and two point eight-tenths mile that we have a sewer line down there, we have already invested, like I say, over $400,000.00 of city funds, general funds. Now, with that money, we could have gone along and got all the improvements needed, improved aeration ponds down there and maybe brought them up to E.P.A. standards. There's ways that we can do it, and I'm going to recommend to the City Council and to the people of Globe that we go at it by ourselves, because there's no way possible that we can proceed along these lines.

We have been coming back and forth; we have been coming back here time after time, and I don't blame you people; I blame us because you were there to furnish the money and furnish the help,

but this program was prematurely started. The people weren't consulted and the truth wasn't brought out.

How much is it going to cost when we already have a million dollars in less than three miles of sewer line down there?

I'd like to give you a figure here, especially the City of Globe taxpayers --

MR. WALKER: Before you leave the issue of the map, are you going to give us a copy?

MR. AGUIRRE: No, I'm going to keep the copy.

MR. WALKER: Is it included in this report of Carollo Engineers?

MR. AGUIRRE: No, this is in the November 27, 1972 Greater Globe-Miami Wastewater Project Report for the Greater Globe-Miami area.

MR. WALKER: I will comment now and say that we will ordinarily keep the record open for submission of additional remarks, and the time will be the 8th of March, 1976, which is 45 days after the publication of notice. I will remark a little later on how to do this.

Could you submit a copy of that map to us at that time to be part of the record? It will help us to review your comments.

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MR. AGUIRRE: Fine. There's another one -- Table 2 taken from John Carollo's book; Cost Distribution. This is just for the intercepter line and for the sewage treatment plant. This would be the cost to the City of Globe taxpayers, and you have at least seven entities: Town of Miami, Lower Miami and Claypool, Russell Gulch, Miami Basin, Sixshooter Canyon, Icehouse Canyon, City of Globe, Echo Canyon, and Central Heights, Lower Pinal Creek and Gila Basin.

Gentlemen, it was a dream. It's never going to come about until you force some people to do it, but anyway, this is project cost for the City of Globe. It would have been $1,556,000.00. Okay, with grants of 85 percent E.P.A. money and state money, it's one point three -- three hundred twenty-three thousand dollars (sic). So the net participated cost to the City of Globe for all we needed was $233,000.00, and that's in the John Carollo report. That's one reason why I went along with it, because we did have money in the bank. We don't have it any more.

Now we have here Table 3, which, correct me if I'm wrong, it's a Distribution of Costs for the improvement district on your report. The City of Globe's total cost with H.U.D. participation

would have been one point sixty-nine thousand -- 1,069,000, which is something that we didn't need at all, and I'm sorry to say that I went along with it. It was a dream. But after studying it, I found out that the City of Globe taxpayers were getting ripped off and probably maybe the county and the City of Miami.

Here we have a section on the operation and maintenance cost for the sewer treatment plant. This is the thing that really set me off. When we decided that we would proceed along the lines, we had to do it ourselves and nobody else came in.

Well, our sewer fees bring in approximately $27,000.00 a year at a dollar per sewer tax, and for the last eight, 10 years, we have taken this money and we have done absolutely nothing for the maintenance of our oxidation ponds.

We started doing work on oxidation ponds about a year ago, and I know this because I did work for the City, and I laid a lot of main sewer lines.

Well, anyway, the total operation and maintenance cost was $140,000.00 per year. Who's going to pay for this maintenance cost? That would have meant to me that we would have to raise our sewer fees to a minimum of at least six-fifty per capita. I couldn't expect the City of Globe taxpayers to do this; no way.

I have held it was about time to come up and be outspoken and that's one reason I fought the sewer and water bond issue, because the truth wasn't told.

I would like to put this in Exhibit 2.

Section 9, Comprehensive Costs of Wastewater Facilities -- I don't know why, but the city, the whole improvement district, would have come about and the County and the City of Miami would probably have more sewer tax than the City of Globe, and yet we were sharing the biggest share of the costs, all of these comprehensive costs, that is. Maybe because they think we have more money, and maybe Carollo thinks we have more money; and this is the one that's really a kicker: Distribution of Project Costs, Typical Cases, Costs reflect participation by E.P.A., H.U.D. and State of Arizona.

Case 1: Case 1 would be a sewer property owner that would be already tied to a sewer sanitation district which would be in the case of Globe, but his figures -- your figures and H.U.D.'s for the plant and intercepters, which is the City of Globe, that's the only thing we needed.

That's the only thing we should have gone for; plant and intercepters in Case 1, and that's the City of Globe, would be $120.00 per property owner.

So, you people can figure it out. We have 2600 sewer taps. That's 2600 properties. That would be three-hundred-and-some-odd now. I had it figured out, but I've lost my figures.

Now, what, what do we actually spend on that, and what do we have for the money we have spent?

The latest figures are around 400,000 that we have spent out of general funds, and here we are coming back time and time again. I think it's about time for the City of Globe to immediately stop and take a good long, hard look at it, and like Mr. Larson says, let's stop, let's stop right now, and the City of Globe -- Maybe we can work something out with you people. We're willing to work with you, we're willing -- Maybe we can complete the intercepter lines from our oxidation ponds up here. I'm willing to go that far for now. You know, oxidation ponds on up here to our city limits. We have $500,000.00 in reserves. I won't fight that if it will go towards the improvements of the oxidation ponds down there and for the intercepter line this way.

When the rest of the county and the City of Miami is ready to come along and we can get together, then I'll say let's proceed along the metropolitan sewer sanitation district.

So, in all these figures coming from John Carollo's book, and Case 2; and this would concern -- and maybe the City of Miami and the County Supervisors have looked at this -- like I said, it would have cost the City taxpayers 120 per property, property owner.

Class (sic) 2: A residence presently on an individual waste system -- septic tank, cesspool, and so forth -- where property is situated upon ground that is level or mildly rolling. That would run them $920.00.

Case 3: The same as Case 2 except the property is situated in rough terrain and the sewer main will only serve one side of the street. That would have run him $1,420.00. That would have outside the county. A lot of people can't afford that. That's one reason why they're not going to come in.

Case 4: A residence situated in a remote area some distance from the end of a sewer main. That's one thousand sixty-six hundred ninety (sic) per property owner. These figures were made

in 1972. How can we proceed along those lines on these reports, on John Carollo's reports, and the figures that we have had?

Now, we're in a, we're in trouble. We should have never gone outside and taken the Holgate sewer system. We had no business going out there at all and, like I made a point last night in the council meeting, I would like to give it back to them for a dollar and, in fact, I'm going to make a motion -- I don't know whether it's legal or not, but we have no business out there whatsoever.

Cobre Valley Sanitation was probably the only sanitation district that was ready to go.

I received two calls last night from people in the Country Club area, and they said they were ready to go, but they had signed petitions and that's as far as they ever got.

Well, I have this to say: I was against bringing in any part of the Cobre Valley Sanitation and which would be Sunset.

Mr. Phil Sawaia -- This was the complaint I received. He's Chairman of the Cobre Valley Sanitation, and he's hooked up already to our sanitation district, but some of those people think that he could care less about proceeding because nothing has been done about it for the last four or five months.

Thank you.

MR. WALKER: Thank you Mr. Aguirre.

Are you going to send us a copy of the report you were referring to?

MR. AGUIRRE: I will get copies today and I'll give it to you before you leave tonight.

MR. WALKER: All right, it would help very much in making a review of your comments if we had the report you were referring to.

Mr. Mitchel Platt.

MITCHEL D. PLATT

Gentlemen, I'm Mitchel Platt, attorney for Steve Bixby, and perhaps some other Wheatfield residents.

We have been involved in this matter for quite some time concerned about primarily the location of the plant site.

We would like to say that we have reviewed the draft Environmental Impact Statement. We feel that it was comprehensive and that it was well-done, followed proper procedures and that it has complied with the law in every respect.

We also feel that the decisions reached

in the Environmental Statements were basically correct. We think the change of alternative locations, the preference indicated, is good, and it avoids zoning problems that would have been in conflict before and many other problems environmentally.

So, we would simply like to say that we basically do agree with the statement and feel it was well-done.

Thank you people for your assistance.

MR. WALKER: Thank you.

Mr. Darmiento, representing the Salt River Project.

FRANK DARMIENTO

My name is Frank Darmiento, Salt River Project in Phoenix.

Let me give you a copy of the letter we sent Region 9.

MR. WALKER: Has this already been sent to us? It's in the file.

MR. DARMIENTO: Yes, it has.

I might, just for the purposes of clarification, I can restate it.

MR. WALKER: I will state, if I didn't already, all letters received will be made a part of the file, and we do appreciate your bringing them here. I will not make this an exhibit because it will be considered as such.

Thank you. Go ahead.

MR. DARMIENTO: Okay. The Salt River Project, in reviewing the Impact Statement, supports the recommended alternative. However, the Project would like to point out that we do have some concern with regard to the proposed phosphate standards that the Environmental Protection Agency is considering for the State of Arizona, in that the potential phosphate discharges or additions to the phosphate concentrations in the Salt River watershed would be of some concern to the Project. But since no specific discussion was directed at phosphate concentration, I believe we really don't have any specific comment to make.

It might be well to consider the quantitative aspects of the problem. Okay.

MR. TERAMOTO: Do you feel that the phosphate contribution from the effluence that is being percolated would be significant then?

MR. DARMIENTO: I have no idea what the concentrations -- what the contribution would be. That's really the question. We know that the natural concentrations in the watershed will exceed

the proposed standards in many instances, so any addition will simply compound that problem.

MR. WALKER: Thank you very much.

MR. McLOUD: Thank you.

MR. WALKER: Mr. Phil Sawaia.

PHIL SAWAIA

Yeah, I'm Phil Sawaia, representing the Cobre Valley Sanitation District; and some remarks have been -- eariler have been said about me that I was hooked up on -- But one thing about it is that a lot of people don't understand that we have been at it -- Cobre Valley Sanitation District has been at this for 10 years, and when we started it 10 years ago it was either the one man, one vote that kept us from doing what it is representing, the one man, one vote deal; and we didn't, couldn't get a concentration from the Attorney General's office of who could vote and who couldn't. Property owners or people living in the area, so it took us about three-and-a-half years to get that decision, and by the time we got that decision and started the, started the project going again, there was something else; money or something else, and then all of a sudden we get this impact deal; so for 10 years we've just been one

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problem after another.

As far as what's there now, we had a -- in November -- no, I think it was June, we had a meeting -- of 1975 -- so, in November of 1975 through the engineering, engineering company of, of Ellis -- at that time, Ellis, Holgate and Johnson -- we had a vote to determine if we should make this and to -- for the yes or no -- and to go ahead with our project in our entities; and the vote -- in other words, we had over 800 and 800 and some-odd property owners. We got 105 votes. We voted this by mail.

Now, we're talking about November, 1975, we voted by mail. 105 voted for, 126 voted against of, of getting charged for the sanitation and improvement district.

All right, that left 400 and say a little over 500 people that didn't say yes or no. So, the Board of Directors of the Cobre Valley Sanitation District -- Now, it was improper. In other words, it was only 20 votes away or 21 votes away of against, compared to who wanted it, and there was over 500 that didn't care one way or another.

So, if we, we figured that we weren't trying to step on anybody's toes. I think we on the

Board of Directors could have gone and said to go ahead because there was 480 -- I mean, over 500 -- so there you would have another court case saying; are those yes votes or no votes, and this would take another two or three years.

So, we figured the best thing was to keep our mouth shut and see what this Environmental Protection Agency was going to do, because we had this fight on and this is why we haven't really started anything since '75; and we have been fighting it and, like I say, it has been one agitation after another, and so we have just been out there in the middle, and one thing about it is: in 1968 and '69 Mr. Ward, I think most of you would know Mr. Ward, which was H.U.D. At that time, he was here during World War II with his housing project, and they had this sewer system done on this -- what we call governmental housing -- down in Claypool, and I talked to him and figured; what was the best way to do it, because we wanted one entity, and Miami wanted one, and Globe wanted one, and he said, "Phil, I'm going to tell you one thing: In the next five years --" this was '68 or '69 -- he said, "within five years they're going to make you go to a unified sanitation district," and he said, "you better start working on it now."

This was his words from the H.U.D., and I said; well, this is our problem here. We do need an area-wide sanitation district, so, so I says okay, I will try my best, I don't know. So, I kept my mouth shut figuring I was trying to get the Cobre Valley Sanitation District into one body. We do need one.

We got so many cesspools and the health and welfare of the people out there isn't any good because, like Mr. Larson had said, these septic tanks just can't take it; this ground can't take no sandy basin in that area.

I think the decision should be made either one way or the other. I don't care where the sanitation plant goes or anything else. A decision has to be made. I don't care if it's in the middle of town, because I have been to Tucson and Phoenix. I have been to big cities, and some of those aerated ponds and everything is right in the middle of all the residential areas and they don't have any problems at all. So, I think the decision sould be made that it should at least -- let's make it to where it should go and then work towards that; and another thing is that I think it's about time, because we have been at it 10 years -- Mr. Larson with the City of Globe has been

on it for five, and I think there's 20 or 30 people fighting this for a good sanitation district for the last 10 years; and I think the decision should be made and stuck to it. I don't care where they put the pond because, like I say, I have been around all over the United States and Arizona, and there's nothing that people are kicking about where the plant goes, and we're ready for it, because I'll tell you one thing: The taxpayers are getting tired of being kicked around especially because in our area all of them are laboring people. They're all independent house owners, and, like I say, they figure they don't have a vote and they figure we've got people representing us in Congress and in the State, and by-golly they're not doing anything, and why should we sit here and fight the agencies when we can't even get our own representatives to do what we want them to do? So the little independent really thinks that he's left out on second base, and I hope the Environmental Protection Agency, regardless of where they put this, that they do consider the small property owner and the small man that really wants this done. In other words, I think the decision's up to you gentlemen or your agency, and I, and I hope to God that you people come up with the right

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decision, irregardless of where it is, because we need it because of the Health and Welfare Department of H.U.D. says we've got to do it, and all we can just tell -- pardon the language -- is to go to hell.

We don't have the money because you've kept it for 10 years. Come and get us, sue us or take our property, we don't have it. The longer we wait the more it's going to cost the independent, because if -- I figure, if you don't make the decision, if, if you're going to pussyfoot this around or baseball it or politically or otherwise, and entity wise, or agency wise, by God it's about time somebody made the decision that the small man can do what he can.

Thank you.

MR. WALKER: Thank you, Mr. Sawaia.

Mr.Bob Hampton, Patio Park Mobile Home Park.

BOB HAMPTON

Hi, I'm Bob Hampton, Manger of Patio Park, representing about 126 mobile home units, approximately 400 families.

About August of 1975, Patio Park was served with a cease and desist order from the State of Arizona, and we have recently offset that

with a permit to discharge wastewater.

A couple of alternatives expressed to us at this time was that we could go in with the City of Miami. Now, this would just magnify their problem that they have already.

So, Patio Park would like to go down on record as being in favor of the treatment plant. This would certainly help our problem as our system is presently plugged up and we're discharging wastewater down the creek.

So, and as the gentleman who just spoke before me expressed, no matter where this plant is located, where it's at, Patio Park would definitely be in favor of being allowed to go into this system and it would solve a lot of the stink and a lot wastewater, and as far as I'm concerned, the whole point of this meeting is for pollution and that the Town of Miami and the septic tanks are definitely polluting the area, and the whole system; so, that's about all I have to say.

Thank you.

MR. McLOUD: One question, please.

I'm not sure where Patio Park is.

MR. HAMPTON: Patio Park is located in Claypool, Arizona.

MR. McLOUD: Okay, thank you.

MR. WALKER: Thank you, Mr. Hampton.

We have a card from Mr. Stephen L. Bixby, representing himself. Mr. Bixby?

STEPHEN L. BIXBY

My name is Stephen L. Bixby. My lawyer, Mitchel Platt, already made an oral statement.

I have a short written statement that I will turn in in triplicate.

MR. WALKER: Thank you very much.

MR. TERAMOTO: Thank you.

MR. WALKER: We will mark a copy of Mr. Bixby's remarks as Exhibit No. 6 for the purposes of this record; and while I have that out, the Draft Environmental Impact Statement has not yet been marked. It will now be marked Exhibit 7 for the purposes of this record.

At the present time, this exhausts the number of cards that have been brought up here by people who wish to make a presentation. Is there anyone here who has signed a card and wishes to make a presentation or who has not signed a card and wishes to make a presentation to us? We are here for the purpose of listening to you.

VOICE: I would like to say something.

MR. WALKER: Mayor Weimer.

KATIE WEIMER

The gentleman that just spoke, I think left the impression that the Town of Miami is in dire needs of this sewer system, but our sewer is working very fine and we are having people from the Health Department come in and test it, and we are not polluting the area, or neither is there any stench or anything, so I wanted to go on record that our system is working very well.

MR. WALKER: Thank you.

MS. WEIMER: I know that the Patio Park has problems, but just like I said, we do not have the money to take them into our sewer system.

MR. WALKER: Thank you.

For the record, I will note this is Mayor Weimer of the City of Miami, who says her system is working well.

Someone in the back. Sir?

MR. HAMPTON: Can I speak from back here?

MR. WALKER: We don't want to open this to public debate, so keep it brief.

BOB HAMPTON

Like to make an additional comment on

Patio Park, that we do not want to go into Miami's sewer system. This is not our intent. Our system works just as well as Miami's.

If the Town of Miami is going to be allowed to continue the way they are, Patio Park should have a chance to continue operation until this thing is resolved.

MR. WALKER: Is that all?

Thank you.

Well, that was Mr. Hampton, for the record, who had spoken before.

Mr. Sawaia?

PHIL SAWAIA

Yeah, I would like to add one more.

I think I got carried away, but I just want to let the Environmental Protection Agency know that me, as being the Chairman of the Cobre Valley Sanitation District, we haven't been asleep. In other words, like I started to express myself before, is that laws and, and court orders have stopped us from really developing the Cobre Valley Sanitation District; and, like I say, I hope that you gentlemen, when you go back to your agency and really get down to honest and earnest thinking of this thing, that you could help the whole area by coming

out with the best of your knowledge and best of your engineering, and placing this thing because we know, and I know that there's been a lot of adverse talk about nobody wants to do this.

Well, you can't really do anything until you have a definite plan or a definite site of anything you want to do, and I think that the people in this area will go to it as long as they have got a definite answer, and this is the way it has to be irregardless.

I know it's a, it's a decision that has to be really made, and I think we get a decision that this would resolve very easily, money wise, project wise and everything, because I think we, as individuals and taxpayers, irregardless of who we represent, sanitation districts or the city or the town, or outside the county and everything else, that if a decision is made that we can work as individuals and as citizens to make this thing the most proper thing to be developed.

MR. WALKER: Thank you, sir.

As previously commented, we are going to hold the record open until the close of business on the 8th of March, 1976 for any supplemental comments or additional material that you wish to submit for the record. This material should be addressed to the U.S. Environmental Protection Agency, Attention Hearing Office, and it will be helpful if you put this code mark on the envelope: HE-126. This is included in the public notice that was published and distributed. HE-126, 100 California Street, San Francisco, California, 94111.

Any remarks that are sent in to us and received by that date will be considered as a part of the record.

Now, as previously --

VOICE: Read that again, please.

MR. WALKER: Certainly. U.S. Environmental Protection Agency, Attention Hearing Office, HE-126, 100 California Street, San Francisco, California, 94111.

Yes, sir?

GEORGE LARSON

The gentleman from Salt River Water Users was talking about phosphates.

I was to a meeting here where the State Health Department within the last 30 days, and they brought up the same question: Phosphate. They even claim that the Salt River was getting contaminated with phosphate from White River and

Black River and on down from people's sewage. There's not many people live up there, and I was just wondering about it.

I was also wondering if you people have a free pond as your No. 11 deal says you're going to have or want to have. If that isn't more or less a phosphate deal than the water treatment plant and using the water with the mines and things like that.

Really, it's a terrible thing to run this water clear down to Pringle as you're going to and spray it out and try to catch some of it when you've got it right here where the mines can get hold of it. I can't, I can't see the point of you at all, if this whole district goes into it and has one big water treatment plant, which they have all over the west, that I know of, and people use it to irrigate with, and they use it for everything else. I can't see sending that down there and evaporating and spraying it out and bothering these people because it's much worse than a water treatment plant, because I've seen them. We've got them right here in our district. There's nothing wrong with them. The Holgate over there has a plant that's been running for quite awhile. You can go over there today and it's working perfectly.

There's several smaller plants here, and, really, your alternate C-1 even suggests a water treatment plant when the mines use the water, and when they don't use it, turn it down the creek. I can't figure your idea of that. You're afraid the mines won't use the water; and then on 1-C you suggest when they don't use it, to send it down the creek. That's in your Impact book here. It's very, very funny, and I, I'm sure that some of their measurements of distances and so on that they've got printed is not right. I know, I went and measured them myself.

MR. WALKER: Thank you, sir.

For the record, that's Mr. George Larson.

Anyone else?

Oh, we have another speaker. Would you come forward and give us your name, sir? Do we have a card for you?

VOICE: No, I didn't think I had anything to say.

MR. WALKER: Did you fill out a card?

VOICE: Yes, I did.

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LYNN M. SHEPPARD

My name is Lynn Sheppard, Gila County Supervisor; and it seems as though the county and the people in the county is coming under quite a bit of criticism because they haven't gone into the system. I know the Board of Supervisors has been criticized for it, but it's beyond our authority to declare any system or any part of the county a sanitary district unless the people in that particular area vote that thing in and set up their governing body like it's supposed to be done, and we can't say that the people in the Wheatfields area or anywhere else is going to tie to a sanitary district; are going to be a sanitary district or if they don't we're going to sell the property. It's completely beyond our jurisdiction and rightfully so. I don't think anyone should have that authority.

That's all I have to say.

Thank you.

MR. TERAMOTO: I have a question.

MR. SHEPPARD: Yes?

MR. TERAMOTO: When you say the people of the sanitary district in Miami and Globe are included in the sanitary district, would they be counted as votes?

MR. SHEPPARD: Yes, they're, they're the -- no, not exactly. Each sanitary district, the way it's set up, there are about seven, I think, all together. I may be wrong, one or so in that calculation. It's been sometime since I looked at the complete map on it, but each one of the proposed sanitary districts, like Russell and Sixshooter, Ice Canyon and Claypool and the Cobre Valley Sanitary District, which has already been formed for 10 years. There's got to be some more information to the people in the county before they're going to go into a sanitary district.

These figures that came out that says approximately this amount of money to do this -- $800.00 to $1200.00 to $1500.00 to $3,000.00 to what is the next figure going to be? I'm sure that none of the people in the county are going to enter into it until there's a cut and dried figure as far as dollars is concerned.

As far as them entering into a sanitary district and, like I say, the Board of Supervisors does not have the authority to say that Russell, Icehouse and Sixshooter Canyon are going to enter into one particular sanitary district. It's up to the people of that area to set up a sanitary district, elect their people, their

Chairman and their Board to represent them as a sanitary district, and that makes them a separate entity in their own self; just like Cobre Valley is at the present time.

Thank you.

MR. WALKER: Thank you, Mr. Sheppard.

Any questions?

Is there anyone else who has or has not registered who otherwise wants to speak this afternoon?

Well, then, as previously announced, we will then recess this hearing until 7:30 this evening in this room.

During the recess, some of the technical staff from the E.P.A. and the consultants will be available for consultation, confrontation or whatever; but that material will not be on the record.

We will reopen the record this evening at 7:30 p.m. here.

(Thereupon, the hearing was concluded at 2:35 p.m.)

oOo

POTTER, SPICER & WARMUTH
PHOENIX, ARIZONA
257-1593

C E R T I F I C A T E

I CERTIFY that I took the hearing in the foregoing matter in machine shorthand, and the same was transcribed under my direction; that the preceding 51 pages of typewritten matter is a true, accurate and complete accounting of all matters adduced to the best of my skill and ability.

I FURTHER CERTIFY that I am in no way related to any of the parties hereto nor am I in anywise interested in the outcome hereof.

DATED at Phoenix, Arizona, this 25th day of February, 1976.

Karen K. Heutzenroeder

Karen K. Heutzenroeder
Certified Shorthand Reporter

djp

U.S. ENVIRONMENTAL PROTECTION AGENCY HEARING

IN RE:

U.S. ENVIRONMENTAL PROTECTION AGENCY

and

THE GREATER GLOBE-MIAMI WASTE WATER SEWAGE TREATMENT PLANT

No.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

309

Globe, Arizona
February 18, 1976
7:30 o'clock p.m.

POTTER, SPICER & WARMUTH
Court Reporters -- Deposition Notaries
22 Luhrs Arcade
Phoenix, Arizona 85003
257-1593

APPEARANCES:

MR. GEORGE LARSON,
Councilman, City of Globe

MR. LUIS AGUIRRE,
Councilman, City of Globe

MS. EVA MARIE SETKA

MR. GEORGE TERAMATO

MR. MATTHEW S. WALKER

MR. RICK McLOUD

Globe, Arizona
February 18, 1976
7:30 o'clock

MR. MATTHEW S. WALKER

Good evening, ladies and gentlemen, we will go back on the record. This is a continuation of the second session of the hearing called by the Environmental Protection Agency to consider the draft impact statement for the Greater Globe-Miami Waste Water Treatment Project.

This afternoon we had the project described and some comments made upon the Rules of Procedure. We heard a number of people this afternoon, they're continuing this session to hear from others this evening. There are registration cards at the door if you wish to register, we would appreciate having your name, address, in any case,

if you wish to make a presentation. We do request that you fill out the card so I can know up here who has requested and what their name is.

Now, after the hearing this afternoon, I was handed two documents and asked to make them exhibits, Mr. Aguirre has furnished me with a copy of the John Carollo Engineer reports that he referred to during his remarks. This is the report dated November 27, 1972, and the title page calls it Report of the Greater Globe-Miami Waste Water Project, Greater Globe-Miami area, Arizona, and this will be marked Exhibit No. 8 for the record. And, I was also handed an excerpt from the Arizona State Laws which generally seems to come from Title 36 and is a -- I don't know whether it's all of Title 36, or just some of the sections that have to do with the sanitary district. This issue came up as to the sanitary district where they may be formed and established, this exhibit offered for that purpose, it will be marked Exhibit No. 9.

I have two cards of people who have asked to speak this evening: Mr. George Larson, Councilman of the City of Globe has some additional remarks for us.

(Next page, please.)

MR. GEORGE LARSON

Mr. Chairman, I spoke to you people today and a few people here tonight come up in the district that have a real lot of trouble with sewer lines, and I thought I'd like to explain to them what I brought up about what we call Phase 4 and try to extend our trunk line, if we ever get it going, on this sewer, on up back of Skyline to where it can take care of these people. Possibly 100 homes up there and there are some of them pumping as much as two times in one month, people with families. And, we realize that our pond down there is not very complete but they're dumping there. It don't make a bit of difference whether it runs down there or whether you haul it in a truck or anyhow, so if you can possibly complete this Phase 4 that I'm talking about it would help those people immensely. And, I've already told you about the City of Globe is working real hard on this. We got started and we got a law-suit, and then we got stopped by the Environmental people and, really, we are about broke, now. And, I would say that we couldn't possibly go by ourself and get a bond issue to finish this situation. And -- but we could put it in Phase 2

and 4 and run this down to our plant and until they decide whether they want the water treatment plant or whether they want to go down below, because these people are hurting real hard. I see no reason why we can't go ahead with these two lines and until something happens in the next ten, fifteen years maybe, why, we can finish the whole situation. Thank you.

MR. WALKER: Thank you, Councilman.

MRS. Eva Marie Setka.

MRS. EVA MARIE SETKA

My name is Eva Marie Setka, S-e-t-k-a, not S-i-t-k-a as in the EPA book and the newspaper articles. I live within one-half mile of the Site 3, the proposed site recommended in the book. According to the study, a petition con-taining about 300 names was presented to the County Board of Supervisors protesting any site in the Wheatfields area. We, the Setka family, are among the 300, as we really live in Wheatfields; many of the other people do not. In the study are various false statements: One, discussions with property owners in the lower Wheatfields area. We were never contacted in any time. We are and have been property owners in the Wheatfields area since the 20s. At no time was anything ever said to us and no book was sent, brought or given to us. We are also property owners in Globe. How come the men who worked on this long, long wonderful book never talked to us? We never saw them once.

That one residence is located about one-half mile and across the road. There are several families living in the area and our house is on the same side as the site.

Three, Site 3 is recommended because it achieves the widest regional benefits without disruptive environmental, social, or monetary impact. How does this figure?

Four, it would be adverse, unfavorable, detrimental or harmful for man or nature in Site 1, but it would be beneficial, advantageous or promote health and well-being for man and nature at Site 3.

Five, in the section between Globe and Pringle surface flow only occurs following rain or snow melts, in the vicinity of Pringle, rather than the flow forms a perennial stream. That's not true because the water runs right past our place. We wish to go on record that we are opposed to Site 3 Plan and any and every other

plan in our area. Thank you.

MR. WALKER: Thank you, do you wish to give us a copy to be an exhibit for the record? We have a transcript, if that's satisfactory to you?

MS. SETKA: Do you mind if I type it over and mail it to you?

MR. WALKER: Incidentally --

MR. McCLOUD: The transcript should be adequate.

MR. WALKER: We have a new Court Reporter this evening, Miss Lisa Vitoff, of the same firm, Potter, Spicer and Warmuth. Sorry I neglected to introduce you.

I have one more card, Mr. Aguirre.

MR. LUIS AGUIRRE

My name is Luis Aguirre, representative of the City of Globe. First off I would like to start out -- I think there's been a heap of abuse thrown at you people and personally I feel that it's much needed to protect the environment for future generations. I don't quite agree with everything you say, but these people in Wheatfields and on down wouldn't have a voice and they should be greatful that you are there because if we leave this up to the local government and special interests we would be in trouble.

Now, I'll be going into another matter I didn't quite bring up and this concerns the City of Globe tax payers. I didn't go into it today because it was the opposition of the Holgate Sewer Development Sewer System. I voted to take in the sewer lines, and after awhile, I see what was coming about. And, the first Phase we took over a public utility and we took off at least $122,000 off county tax roles, which, by the way, is in School District I, and in our school district we have very little assessed valuation and our school district is fighting for every last dollar to educate kids who benefitted by that Copper City and Holgate. What ramification came out of that? We lost $26,000. The school districts want monies. Now, who is going to take the brunt of the whole thing? Are retired people and people on fixed incomes? We have to make that money up some way or other. Who is going to pay for it, the state tax payers? I aim to find out whether it was legal that we do it and I also plan to file suit, a class action suit, because I know I do not believe that a city tax payer should be subsidizing a sanitation district that's outside the city limits. It's well known that

sanitation is not a profit making business.

I'm going to look into the matter and if it's possible I would like a motion that would give it back to Holgate, would give them the dollar.

Now, we have some advice from John Carollo and Don Preisler, he was in charge of the specification of selections of the whole project, the Holgate sewer development. I believe that he was in conflict of interest working for them and working for us. Now, at the next public meeting I will make a motion to give it back and I hope that Don Preisler remembers that we do give it back because this long range goal is far away. We're losing money according to the audit. We lost $500 in six months and as everybody can tell you that studied this as of now. Holgate is paying for the operating and is in charge of the operation of the plant, and as of July 1st we're going to have to take over the whole cost. I'd like to see them take it back, the City of Globe takes care of its problems here. Mr. Larson said that, that we should go and help these people of Ward I and I most sincerely agree with you, but there is other ways to go about it. Having worked for the City ten -- about eight, nine years ago, I think Mr. Larson and other City

Councilmen -- we put in main lines all the way up to Crestline, main lines down to the oxidation pond with City revenues. I have suggested that many times that what we have paid the engineers and money that we have put in there we could already have sewer systems up to the people in Skyline put in. What have we got now? Almost half a million dollars with your money, which is our money, tied up down there. It's not going to go anyplace. I believe it's time for the City of Globe and our Council to sit down and see what we're going to do for the people of Skyline. Thank you.

MR. WALKER: Thank you.

MR. GEORGE TERAMOTO

In your -- do you have any comment on the proposed alternative in the draft, I address the Regional System as proposed in the EIS?

MR. AGUIRRE: I think probably -- no, I haven't made, you know, I've studied, but I haven't made up my mind as of now. I think the only solution to the whole thing will be if all the entities get together before we go any further, come to an agreement how it's going to be paid for. I think that's the first thing in order, and talk

to all of the people concerned, all of the people in Wheatfields, they should have consulted them from the very start, a lot of them weren't. I think that would be the first thing in order to get everything together before we have to go into the mechanics we have to find out how we're going to pay for it. First of all, we can sit here and talk all night how we're going to pay for it. Is the City of Globe going to pay for the whole thing? Are you going to force the rest of the county and Town of Miami to come in with us? Personally I don't think you can.

MR. TERAMOTO: Thank you.

MR. WALKER: Thank you.

This exhausts the cards I have before me. Anyone else who has signed up a card requesting time to speak? Anyone else who desires to address us this evening? I observe none.

Mr. Teramoto, would you explain the procedure of what happens next, what is going to happen to all of this record, what happens next and what conclusions can be expected.

MR. TERAMOTO: The process calls for addressing all the comments and questions that were raised at the hearing here, also, every written comment will be addressed to the final

EIS. The final EIS will be the document that would be the end product. After publication of the final document which would include a chapter of your comments and responses, the Council of Environmental Quality requires a 30 day waiting period before any federal action can take place. So, this is the period that if you have any other comments to make or if the Council of Environmental Quality has any comments to make, this is in Washington, they can address us at that time. After the 30 day waiting period is over then a federal, any federal action can take place.

MR. WALKER: The federal action in this case would be the grant?

MR. TERAMOTO: The grant offer or -- yes, the grant offer.

MR. WALKER: Yes.

MR. TERAMOTO: Yes, sir.

MR. PHIL SAWAIA

Mr. Phil Sawaia from the Cobra Valley Sanitation District. You just commented that federal action would be as grants or anything else. Now, would this mean if you moved the down lines down to Phase 3 that the federal government would come up with that much more money than to the

expense of the original Phase 2?

MR. WALKER: I don't think we can make a comment as to what the grant is going to be. It would have, of course, to conform with the final Environmental Impact statement.

MR. PHIL SAWAIA: You would recommend that more federal money be granted if that expense is further than where the original plans for it were before this court suit?

MR. TERAMOTO: Any eligible construction cost, one that is deemed eligible the federal government would participate in 75% of the total eligible construction cost. I mean, we have the obligation to give you 75% of the total eligible cost, but the total eligible cost has to be determined by us and the State -- see, some of the things in the construction grant program are not eligible. For example, acquisition of the land that is not directly related to the treatment process is not eligible, so that the cost is normally formed by the applicant. Another example would be rights of ways and acquisitions of rights of ways are not eligible. Things that are eligible are consultant fees directly related to the project, fees that are used to prepare the plans and specifications and all construction costs of the project.

Does that answer your question?

MR. SAWAIA: That answers my question.

MR. WALKER: I know it's a complicated answer, it's difficult to be precise and also be brief.

MR. LARSON: Still speaking on this Skyline, Mr. Aguirre more or less said: Taking care of people in Ward I, that isn't the idea at all. I didn't ask anything like that, I asked for the Phase 4 on that 75% to help those people. That was the idea, we're not asking those people up there, they can expect to pay their pro-rated part, but they have to put a line up there for a couple of miles almost, that will be an awful lot of money. They can't afford that, they -- what I was asking for is what you would call Phase 4? You have Phase 2, is a line up to, well, it's up where it's turned to go to -- the road forks going to Ice House Canyon. Now, they have a long line trunk line to put up to get up to them.

That's all I ask, is for this 75% to help those people out the same as -- they're on a trunk line also, that's what I meant, it wasn't for the City of Globe to do that at all.

MR. WALKER: I think we understand Mr. Larson. For the record, this is remarks from Mr. Larson.

This is one of the reasons we're having a transcript so that we don't get: He said, I did not say, situation. I thought I saw a hand up over there.

MR. AGUIRRE: I would like to clarify one thing for Don Preisler: Phase 4 is the interceptor line, right, or is it Phase 3?

A VOICE: I have no comment.

MR. AGUIRRE: Phase 4, I believe, is the sewer improvement.

MR. LARSON: Just -- I am Mr. Larson -- I asked, they had these people to put on Skyline, there's no Phase 4 at all. It's 1, 2, 3. 1 and 2 is the trunk line and 3 is the water treatment plant in our --

MR. AGUIRRE: That's Phase 1.

MR. LARSON: Phase 4 came up today.

MR. AGUIRRE: I'm concerned -- asked whether the only people, the only way that the people in Skyline, most of the District 1 is connected by the sewer improvement district, that's one the City of Globe doesn't need. For this reason, that it's included in the Globe area, I feel this way, I feel that the City should help the people in Skyline but I would feel that I should pay for your improvement. Of course, the Ash Street this way don't pay for improvement, this way I would like to clarify, I would go 100% back to the people, that's what I meant, Ash Street all the way down to the city limits or here. There's no improvement under the sewer improvement -- not the interceptor.

MR. WALKER: Speaking for the federal agency, our concern is what is the Environmental Impact Statement. Mr. Aguirre addressed the Environmental aspect of the project, how the local agencies dealt with their local problem is a matter for them, a state law in which we prefer not to intervene. Furthermore, which is Phase 1, 2, 3, 4 is all set forth in the document so, I don't think we need to argue here about it. This is, as I said before, the purpose of having a written record. It would be on file with us, anybody else who wants to read it can read it. If you want to have a copy of your own you should, of course, make independent arrangements with the Court Reporter, they had agreed to make arrangements with you, but as far as the internal affairs of your local community we would prefer to leave this to the local community. We have our problems and it's quite a house full as it is.

Now, on the Environmental Impact Statement is there anything further to be said tonight?

MR. RICK McLOUD

I'd just like to mention that we have one additional copy of the Draft Impact Statement right here. We have quite a number of copies of summaries of the Draft Impact Statement. Anyone who would like to come up and get their own personal copy please feel free to do that.

MR. WALKER: Please don't trample on the way in.

MR. McCLOUD: All of one copy here.

MR. WALKER: Thank you sir, then it does appear that we have completed our business for the evening. I wish to thank all of you for your attention and for your remarks. I do wish to assure you that all of the remarks, those that are given verbally, those given in writing, will be given careful consideration and I will want again to announce that we will keep the record of this hearing open until the close of the business at the regional office in San Francisco on the 8th of March.

Now, any comment should be addressed for delivery to: U.S.Environmental Protection Agency, Attention: Hearing Office, HE -126 Region IX, 100 California Street, San Francisco, California 94111. And, with the exception of the remarks and comments that are yet to come in, this concludes our hearing. We thank you all very much.

I, LISA VITOFF, having been first duly sworn and appointed as Official Court Reporter herein, do hereby certify that the foregoing pages numbered from 2 to 18 inclusive, constitute a full, true and accurate transcript of all the proceedings had in the above matter, all done to the best of my skill and ability.

DATED this 25 day of February, 1976.

Lisa Vitoff
Court Reporter