CONDITIONAL USE PERMIT APPLICATION

CHOLLA SANITARY LANDFILL

EL MIRAGE, ARIZONA

February 1989

CONDITIONAL USE PERMIT APPLICATION
FOR THE
CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

Prepared for

BROWNING-FERRIS INDUSTRIES OF ARIZONA, INC.
PHOENIX, ARIZONA
February 1989

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Project 372-15.01

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CONDITIONAL USE PERMIT APPLICATION FOR THE CHOLLA SANITARY LANDFILL

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Date:
February 1989

Request:
Conditional Use Permit for a Sanitary Landfill

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1.0 INTRODUCTION

This document presents the development plan for the proposed Cholla Sanitary Landfill in the City of El Mirage, Arizona.

The introductory information briefly covers the background to the plan presented here, and describes the physical characteristics of the landfill site.

1.1 BACKGROUND

This conditional use permit application is being made by Refuse Research, Inc. in conjunction with Browning-Ferris Industries of Arizona, Inc. The property that is the subject of this application is bounded by Olive Avenue on the north, El Mirage Avenue on the west, Northern Avenue on the south, and the Agua Fria River on the east. The property is presently owned by Union Rock & Materials Corporation which utilizes the property for sand and gravel extraction (quarry) purposes.

Although Refuse Research, Inc. is the applicant, it is anticipated that the conditional use permit for a sanitary landfill will be granted solely to Browning-Ferris Industries of Arizona, Inc. Refuse Research, Inc. will have no interest in the site or in the operation of the landfill. If all required permits are obtained, Browning-Ferris Industries of Arizona, Inc. will purchase the site from Union Rock & Materials Co. and operate the landfill. Union Rock & Materials Co. will continue the quarry operations. In this instance, sanitary landfill and quarry operations are complementary, and will proceed simultaneously.

The site will be used for disposal of municipal and residential wastes only; no hazardous wastes will be accepted. Upon completion of development, the site will be reclaimed for open-space uses.

1.2 BROWNING-FERRIS INDUSTRIES

Browning-Ferris Industries, Inc. (BFI) is an international waste services company with a strong financial foundation and a record of corporate growth and progress in its field.

Browning-Ferris Industries is one of the largest publicly-held companies engaged primarily in providing waste services. The company's subsidiaries provide collection, transfer, processing, recovery and disposal of solid wastes and chemical wastes for commercial, industrial and governmental customers, and solid waste collection and disposal services for residential customers.

BFI subsidiaries also provide municipal and commercial street and parking lot sweeping, waste collection, treatment and disposal services for health care customers, portable rest rooms, and public transportation services. Further, some subsidiaries are active in the waste-to-energy conversion field.

Over 18,000 employees of BFI subsidiaries and affiliates operate in 340 districts serving communities in the United States, Australia, Canada, Kuwait, the Netherlands, Puerto Rico, Saudi Arabia, Spain, the United Kingdom and Venezuela.

Although there are several methods for treatment and disposal of solid wastes, the sanitary landfill remains an indispensable part of the solution; although the developmental costs of landfills continue to skyrocket, the landfill still provides the least expensive means of environmentally safe disposal. BFI has operated over 150 sanitary landfills and is a leader in their design and operation.

BFI's primary goal in landfill site selection, design, and operation is environmental protection. The firm's stringent environmental policies are applied from the site selection process through landfill design and operational phases by using the design technology and management expertise that have made BFI the recognized leader in the sanitary landfill business whose success can be attributed to:

- BFI's site selection process which requires compliance with a long list of criteria including geology, hydrogeology, topography, size of property, soil conditions, proximity to market, quality of access roads, adjacent land use and other mandates.

- BFI's proven design process features, including liner design, quality control and assurance programs, leachate collection system design, storm-water control, water balance calculations, leachate management plans, ground-water monitoring programs, and methane-monitoring techniques.

- BFI's efforts to ensure that landfill operations are as trouble-free as possible through employee training, application of proven security safeguards, and fulfillment of such daily landfill tasks as compaction of wastes, daily cover, use of litter fences, removal of stray debris, and watering on-site roads.

- BFI's endeavor to make its landfills productive, clean, safe, secure and quiet.

BFI of Arizona, Inc. presents this information to the City of El Mirage, Arizona as part of the application for a Conditional Use Permit.

2.0 SITE CHARACTERISTICS

2.1 LOCATION

The proposed Cholla Sanitary Landfill is located in the southeast corner of the City of El Mirage, in the midst of the growing West Valley portion of the Phoenix metropolitan region (see Figure 1). The immediate vicinity of the site is and will remain dominated by industrial uses, including Luke Air Force Base, Glendale Municipal Airport, various industrial parks, two wastewater treatment plants, and several gravel and sand mining operations. Further to the north and south are the rapidly growing residential communities of Peoria, Sun City, Litchfield Park, Goodyear, and Avondale.

The proposed site lies in the West Salt River Valley (WSRV) Basin of the great Salt River Valley. This basin is bounded on the north by the Hieroglyphic Mountains, on the east by the Salt River and Phoenix Mountains and the Upper East Salt River Valley Basin, on the south by the Buckeye and Sierra Estrella Mountains, and on the west by the White Tank Mountains.

2.2 HYDROGEOLOGICAL SETTING

The proposed site is located in the great Salt River Valley ground-water basin which is divided into two sub-basins, the West Salt River Valley (WSRV) Basin and the East Salt River Valley (ESRV) Basin. The site is in the WSRV.

The WSRV basin is filled primarily with alluvial debris eroded from bordering mountain ranges to the west and north. The nearby White Tank Mountains are composed chiefly of Precambrian granite rocks, gneiss and schist, and Tertiary-Cretaceous granite rocks. The alluvial sediments in the central area of the WSRV are estimated to be at least 10,000 feet thick, and are composed of unconsolidated to semiconsolidated clay, silt, sand and gravel.

The generalized stratigraphy of the WSRV is complicated by the existence of a large salt body enclosed within the alluvial sediments. This salt mass, named the Luke Salt Body, lies beneath the proposed site at depths of possibly up to

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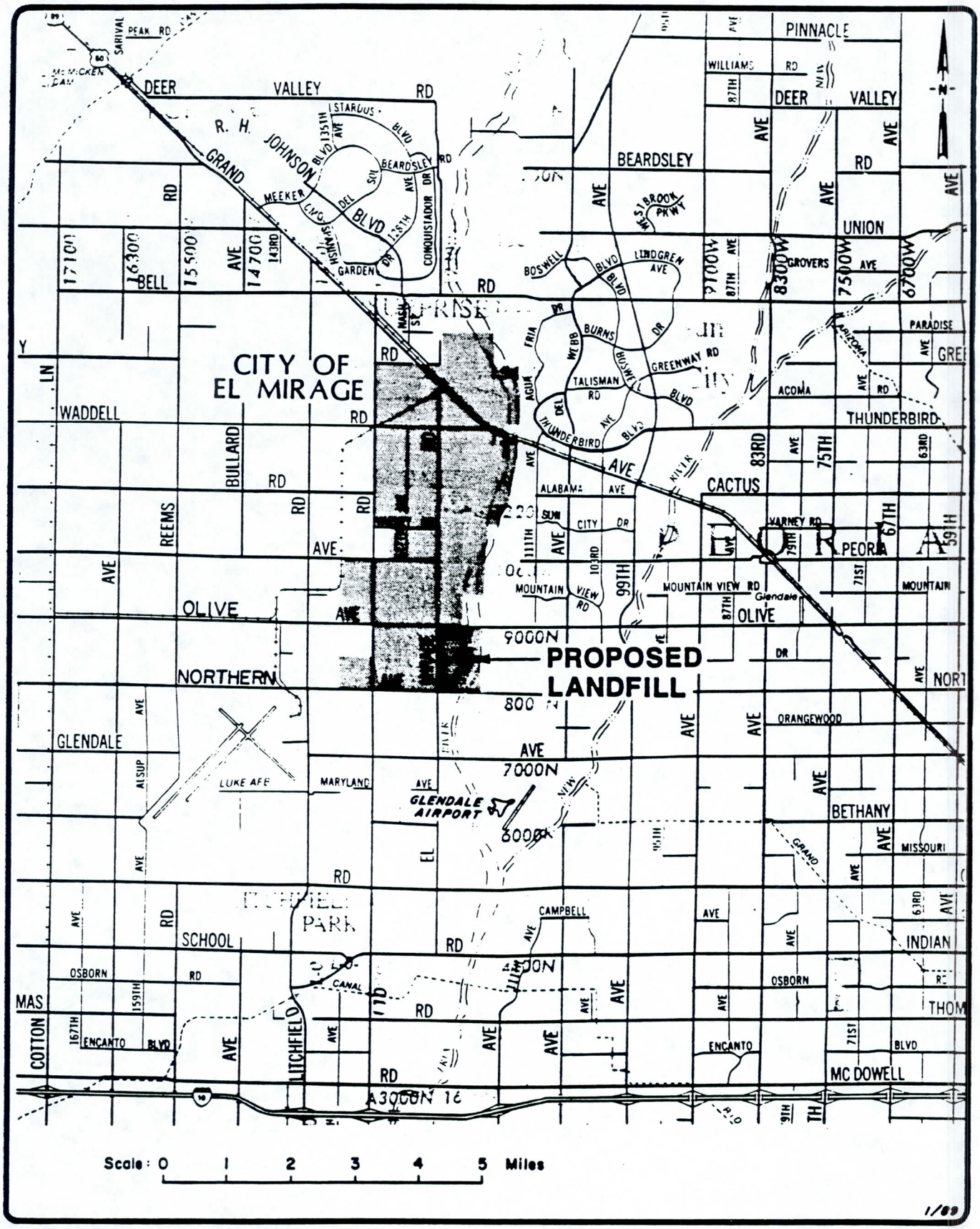

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PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

SITE LOCATION MAP

FIGURE 1

PROJECT NO. 372-15.01

1,700 feet. The Luke Salt Body strongly controls the structure of local basin deposits and has had very significant impact on the depositional environment and the geohydrology of the deposits.

Based on information obtained from exploratory borings conducted at the proposed site, and from observations of the existing quarry pit exposures, the site is underlain by a highly variable sequence of alluvial deposits composed of clay, silt, sand, gravel, and cobbles. Coarse-grained materials (sands, gravels, and cobbles) dominate the stratigraphy to a depth of at least 120 feet. Deeper deposits (to a maximum depth of 900 feet) are predominantly fine grained.

Ground water occurs under unconfined conditions principally in the upper 600 to 900 feet of the alluvial sediments in the WSRV. Depth to water is in the range of 250 to 400 feet in the site vicinity. Use of ground water is intense in certain areas and has resulted in water table declines due to ground-water pumpage. This excessive ground-water depletion has led to subsidence of the land surface. Subsidence has caused some earth fissures in the alluvial deposits, in some areas, of the WSRV.

In the vicinity of the proposed site, earth fissures were observed to the west and southwest of the site. A study which included literature surveys, interviews with knowledgeable professionals, aerial photographic study, reconnaissance surveys, and geophysical (seismic) testing, was performed to determine whether earth fissures exist at the proposed landfill site. This study indicates that no fissures exist within, or in the immediate vicinity of the site.

2.3 CLIMATOLOGY

The proposed site is characterized by a desert-type climate. In Youngtown, located approximately 2 miles north of the proposed site, average annual temperature extremes range from a low of 35°F in January to a high of 106°F in June; mean temperature values for the same months are 52°F and 91°F.

Evaporation data recorded at the Mesa Experiment Farm, (Arizona Climate, Arizona State University [ASU], Institute of Atmospheric Physics, 1964) indicates

an annual Pan-A evaporation of 82.97 inches. This farm is located in Mesa, Arizona, approximately 45 miles southeast of the proposed site.

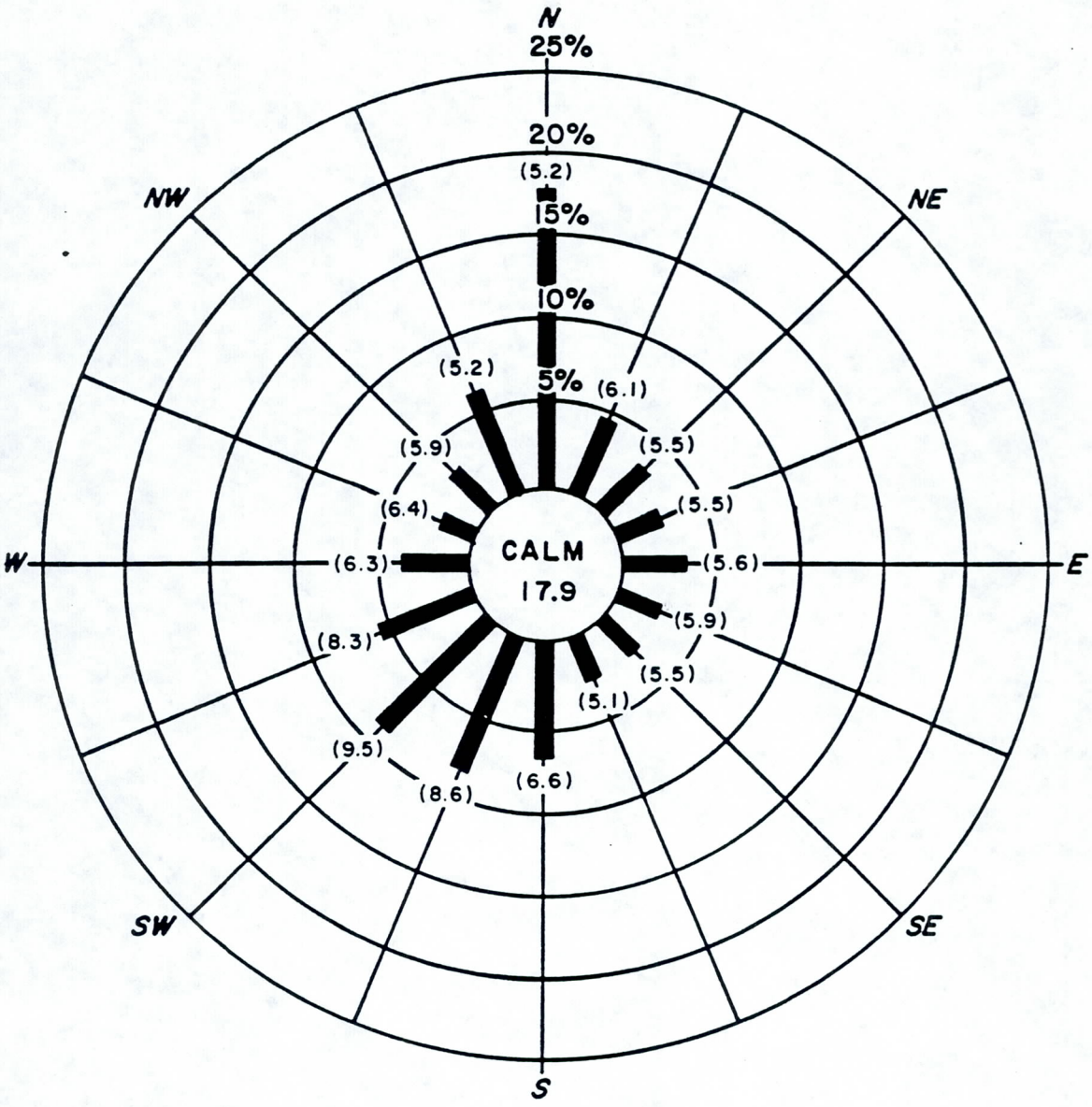
Data gathered from the same ASU document (Arizona Climate) indicates a maximum annual precipitation of 20.31 inches recorded in 1905. The United States Department of Agriculture document, Soil Survey; Eastern Maricopa and Northern Pinal Counties Area Arizona indicates an expected 24-hour, 100-year precipitation of 3.75 inches. Normal precipitation recorded in Youngtown, which is 2 miles north of the proposed site, is 7.65 inches per year; December and August have the highest monthly rainfall of 1.03 inches, and 1.05 inches, respectively. In Youngtown, the highest recorded rainfall in one day was 3 inches in August of 1939.

In general, rainfall in the area of the proposed landfill is characterized by two peak periods during the year. The first peak generally occurs in August resulting from thunderstorms which develop in the mountains east of the site. These storms tend to be of very short duration and high intensity. The second peak generally occurs in December. This precipitation comes from middle-latitude storms which develop over the Pacific Ocean, tends to be less predictable, and may last for several days.

Wind speed and direction monitored at Luke Air Force Base (AFB), located over 2 miles west-southwest of the proposed landfill indicate that winds in the site area are predominantly from the north (17.4 percent of the time) and from the southwest (8.6 percent of the time) with mean speeds of 5.2 and 9.5 miles per hour, respectively. Calm weather occurs 17.9 percent of the time. A wind rose developed from the Luke AFB data is presented as Figure 2.

2.4 UTILITIES AND EASEMENTS

The proposed site is surrounded on three sides (north, west, and south) by dedicated roads. These roads, Olive Avenue, El Mirage Road, and Northern Avenue are currently dedicated to a width of 110 feet. Currently, there are no known or planned utilities in the area to be landfilled.



station: Luke AFB, Arizona

location la: 33°33' **lo:** 112°22'

period: 1969-1970, 1973-1981

no. of observations: 84,753

frequency: All hours

REFERENCE:
National Climatic Center, Revised Uniform Summary Surface Weather Observations, September 1981

NOTE:
(5.5) indicates mean wind speed in miles per hour.

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WIND ROSE

FIGURE 2

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Utility poles exist in the near side road right of way along El Mirage Road and in the far side road right of way along Olive Avenue and Northern Avenue. These poles provide electrical and telephone service.

2.5 CULTURAL RESOURCES

Archaeological Consulting Services, Ltd. (ACS) conducted an overview of existing information pertaining to known cultural resources on the proposed landfill site. This included review of archaeological files at the Arizona State Historic Preservation Office (ASHPO) and at ACS. No archaeological sites were documented and the ACS overview concluded that the cultural resource sensitivity is low within the proposed landfill site. Based on these findings no further evaluation was deemed necessary.

2.6 ECOLOGY

Approximately 30 percent of the proposed site has been quarried for sand and gravel by the Union Rock and Materials Corporation. These quarry operations will continue until the proposed site is fully excavated. Current and planned quarry mining will alter the natural habitat and prevent the establishment of a permanent habitat for indigenous plants and animals. Indigenous vegetation occurs in the currently unused portion of the site. Reclamation of the quarry pit as a sanitary landfill will pose no significant ecological impact.

3.0 DESIGN AND CONSTRUCTION PROVISIONS

This section presents general information on the proposed design and development of the Cholla Sanitary Landfill and its impact on the environment.

3.1 GENERAL

The proposed site for the Cholla Sanitary Landfill is located in the west half of Section 36, Township 3 north, Range 1 west of the Gila and Salt River Base and Meridian, in the City of El Mirage, Arizona. The topography of the site is basically flat. Elevations at the site currently range from approximately 1065 to 1091 feet mean sea level (MSL). The gradient across the site is approximately 0.5 percent towards the southeast.

The proposed landfill will be located on a parcel of approximately 320 acres. As shown on Figure 3, the eastern boundary of the property lies in the floodplain of the Agua Fria River. However, landfill development will not occur in this portion of the site. The proposed landfill will only encompass the area indicated on Figure 3. This landfill area comprises approximately 196 acres, including the landfill development and the entrance facilities.

The landfill area will be surrounded by a perimeter buffer zone. As shown on Drawing 1 (Final Grading Plan) and on Figure 3, the buffer zone will have a minimum width of 100 feet to the roadway right of way along the northern, western and southern sides.

Landfill development will not occur in the flood plain of the Agua Fria River. Since the proposed landfill will not encroach on the flood plain of the Agua Fria River which occupies the eastern portion of the property, the buffer distance from adjacent property along the eastern perimeter will be no less than 440 feet (see Drawing 1 and Figure 3).

As shown on Figure 4, the 100-foot buffer at the southern, northern, and western sides, along with the 110 feet of road right of way, will provide a total buffer distance of 210 feet from any future development on adjacent properties. The

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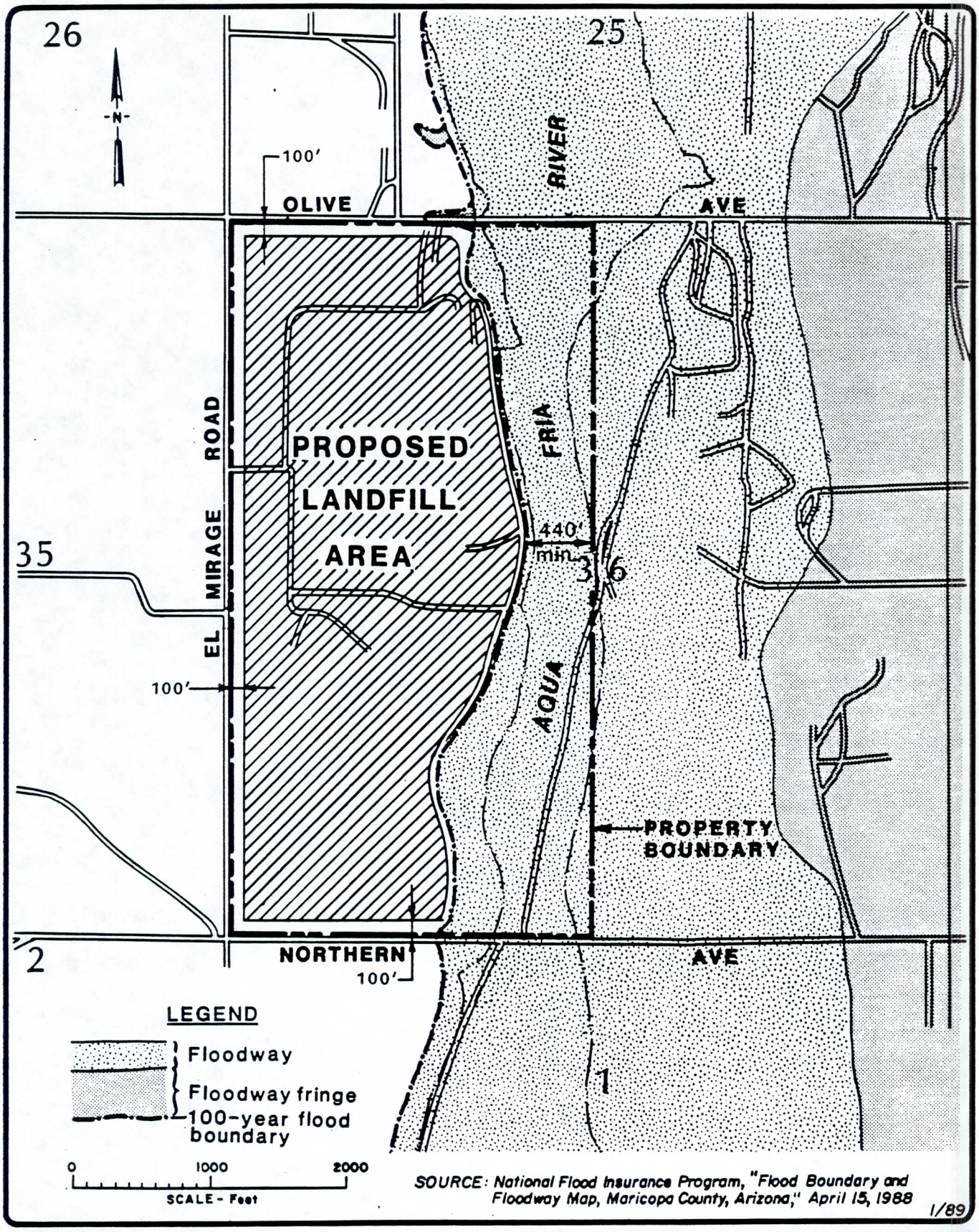

SOURCE: National Flood Insurance Program, "Flood Boundary and Floodway Map, Maricopa County, Arizona," April 15, 1988

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PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

SITE MAP

FIGURE 3

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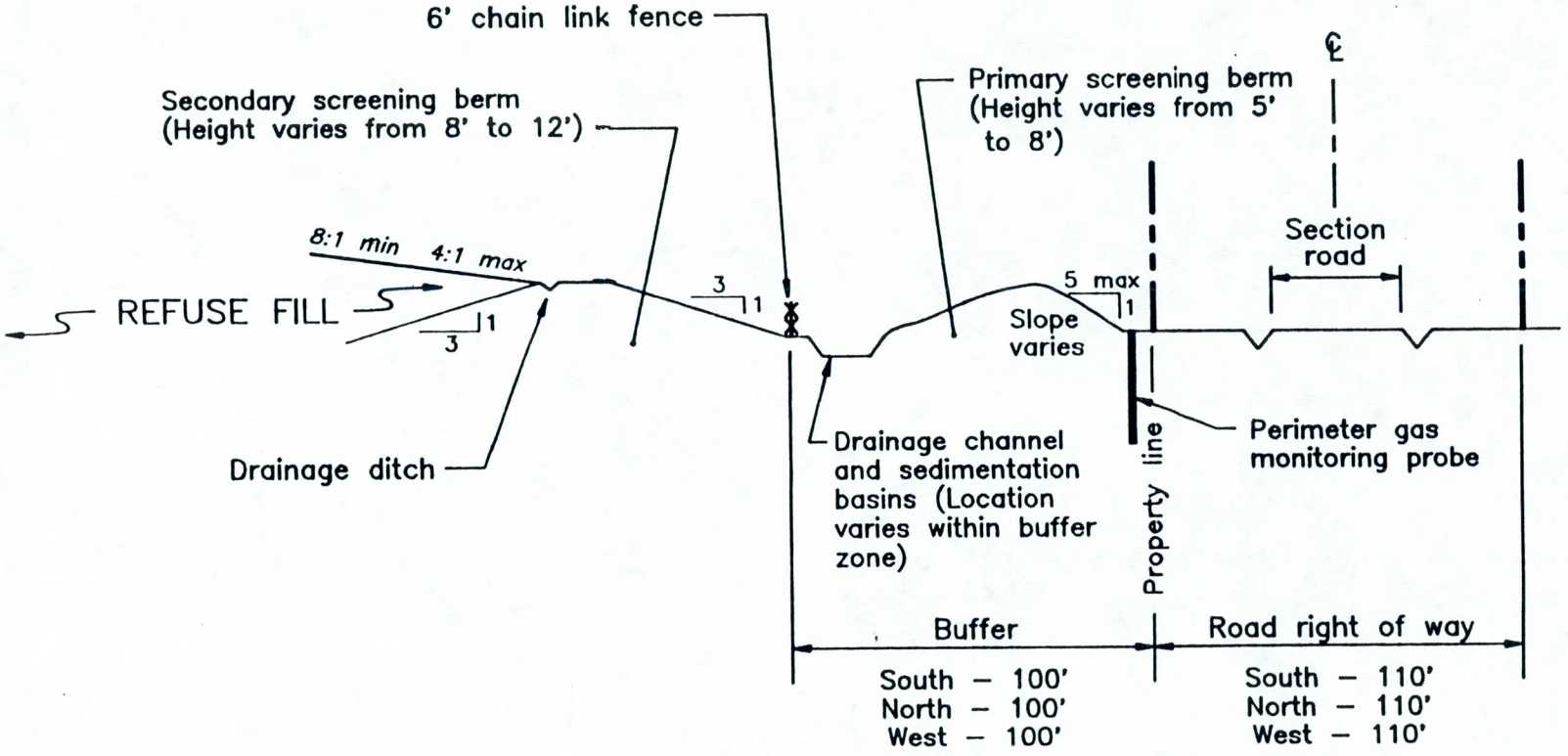

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CROSS SECTION THROUGH SOUTH, NORTH & WEST BUFFER ZONES

FIGURE
4

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buffer area adjacent to the existing road right of way will be used for primary screening berms, drainage and sedimentation facilities, security fencing and environmental monitoring facilities. The primary screening berms (5 to 8 feet high) will be landscaped to create an aesthetically pleasing external appearance and to screen the activities on site.

As shown on Figure 5, the landfill development will be kept a minimum of 50 feet away from the Agua Fria 100-year flood plain boundary. This 50-foot buffer along with the perimeter screening berm will keep the actual limit of refuse fill approximately 100 feet away from the Agua Fria 100-year flood plain boundary. The flood plain boundary will be improved with slope erosion protection, as shown on Figure 5 and Drawing 2, and discussed in Subsection 3.2.5. The portion of the buffer zone that is outside the flood plain will be used for security fencing and environmental monitoring facilities. The entire buffer area will be developed to minimize negative visual impacts.

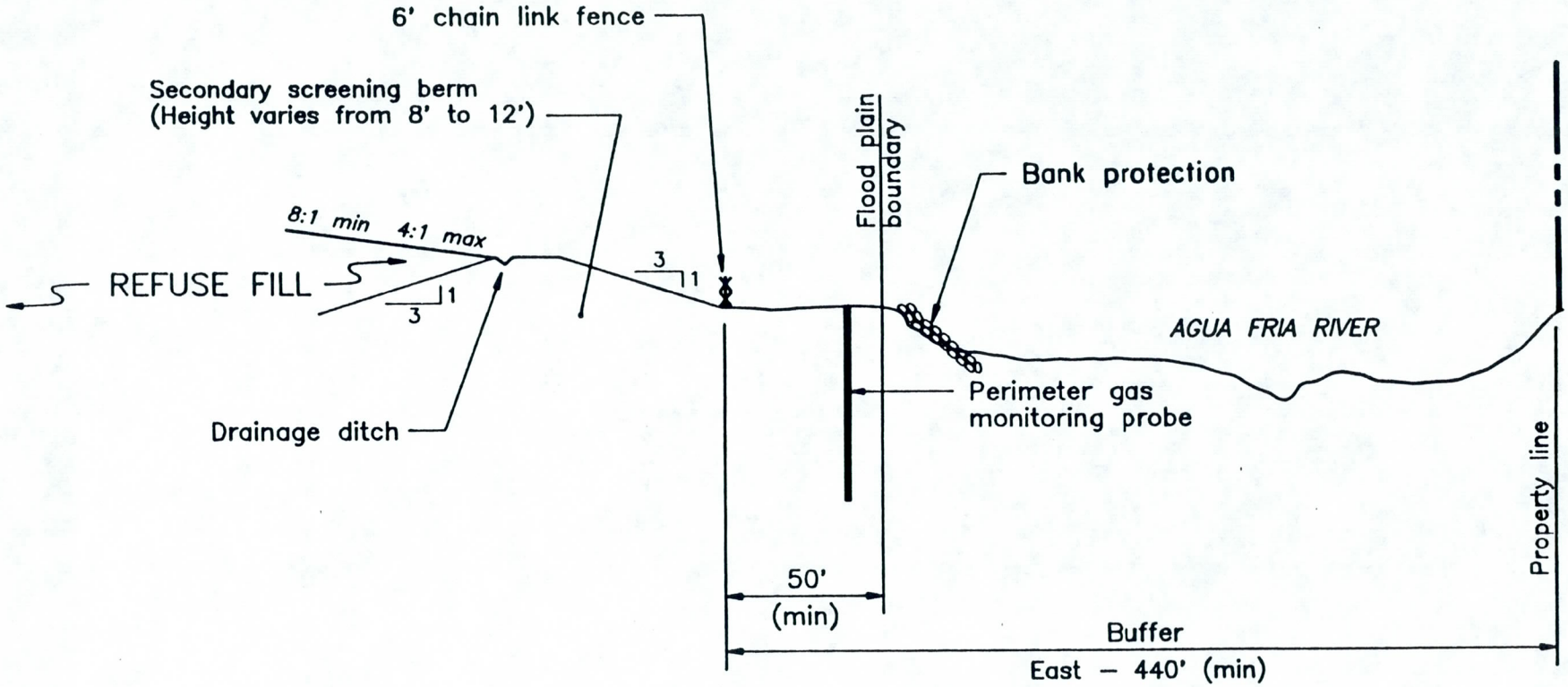
3.2 LANDFILL DESIGN

The proposed landfill design is based on geologic/hydrogeologic, engineering and environmental assessment data, and complies with Arizona Department of Environmental Quality (ADEQ) development requirements for a sanitary landfill. The following sections describe the current plans for landfill development. Changes in technology or regulatory requirements may result in modifications to these plans.

3.2.1 Grading Plan

To conform to the level topography surrounding the site, the average height of the proposed landfill will be approximately 40 feet with a peak height of approximately 75 feet above grade as shown on Drawing 2, Sections and Details.

Minimum final landfill slopes of 5 percent will be maintained on the landfill's flatter top slopes to provide adequate drainage of the landfill and prevent ponding after anticipated settlement of wastes underlying the upper landfill slopes. Minimum



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CROSS SECTION THROUGH EAST BUFFER ZONE

FIGURE
5

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final landfill slopes of 12.5 percent will be maintained on the landfill's steeper side slopes along the landfill perimeter to minimize erosion while preventing drainage slope reversal due to landfill settlement. Maximum final landfill slopes will be no steeper than 4:1 (horizontal:vertical) to allow the development of aesthetically pleasing final landfill contours.

3.2.2 Excavation Plan

The maximum excavation depth for the proposed site is estimated to be approximately 82 feet below the present ground surface. Maximum excavation slopes of 3:1 will be used to provide stable construction slopes. Minimum excavation slopes will be 1/2 percent to allow for the construction of an effective leachate collection and removal system.

Hydrogeologic information recently obtained from the site indicates that there will be approximately 200 feet separating the excavation base from the ground water. This excavation will allow for continued quarry operations by the Union Rock & Materials Corporation and provide soils for final cover, perimeter screening berms, and daily and intermediate cover. The estimated volume of soil needed for landfilling operations is based on several assumptions, such as refuse to soil ratio of 4:1 for daily and intermediate cover. If the amount of soil used in the future differs from these assumptions, the quantity of soil excavated can be modified by varying the depth of excavation. Whenever possible, daily and intermediate soil cover will be moved directly from the excavation to eliminate double handling of excavated soils.

3.2.3 Final Cover

As the landfill areas are filled to final refuse fill grades, the refuse will be covered with a minimum of 4 feet of final cover. Final soil cover components, from top to bottom, consist of

- 2 feet minimum of vegetative top soil
- 2 feet minimum of compacted low-permeability soil

The final cover will be the system that minimizes rainfall percolation into the sanitary landfill modules. Therefore, it will be constructed as landfill modules are brought to final grade. The final soil cover surface will be vegetated with native plants and grasses to minimize erosion, enhance evapotranspiration, and thus minimize leachate production. This final cover was evaluated using an EPA-developed model for evaluating rainfall infiltration, which showed that no infiltration would occur.

3.2.4 Drainage Facilities

Drainage facilities are incorporated into the landfill design to control off-site run-on, on-site run-off and drainage near the active landfill operations.

During periods of heavy rainfall, off-site run-on from adjacent properties will be controlled and kept away from the site by drainage ditches which will be constructed along the northern, western and southern perimeters of the site. These perimeter ditches will collect the off-site run-on and discharge it directly to the Agua Fria River. In addition, the roads on and around the site are elevated above the natural ground elevations and will serve as protective berms to prevent run-on flooding at the site during periods of significant wet weather.

On-site surface runoff will be collected in drainage ditches constructed on the landfill surface and on top of the landfill secondary screening berm and diverted away from the landfill. All runoff collected in these ditches will pass through on-site sedimentation basins.

The location of the sedimentation basins and the flow direction of surface runoff is shown on Drawing 1. Two sedimentation basins will be constructed on the west side of the site, each with a maximum capacity of 2.2 acre-feet. One sedimentation basin will be provided on the northern perimeter, and one on the southern perimeter, each with a maximum capacity of approximately 3.7 acre-feet. All sedimentation basins will be sized to handle flows from a 100-year, 2-hour storm and will reduce peak discharge volumes by approximately 50 to 60 percent.

Temporary drainage structures, diversion ditches, or temporary berms will be used to divert rainfall runoff around the active landfilling operation. The bottom of the excavation will be sloped away from the area being landfilled. Water collecting in the excavation will be pumped out before it accumulates and contacts the refuse fill. Intermediate landfill slopes will be graded to prevent ponding water.

3.2.5 Flood Control Facilities

The proposed Cholla Sanitary Landfill is outside the 100-year flood plain as defined by the federal government's National Flood Insurance Program (see Figure 3). However, the site is designed with perimeter soil berms so that in the event of a greater flood, no flood water would enter the landfill and come in contact with the refuse.

Any shallow sheet flooding resulting from area rainfall runoff will be kept out of the landfill area by a berm system that encompasses the area containing refuse fill. This berm system includes a permanent perimeter berm that ranges in height from 8 to 12 feet, and temporary berms, as needed, approximately 4 feet in height. Temporary berms will be constructed to isolate new areas before starting landfilling operations.

In sum, the landfill is designed so that no flood waters will ever come into contact with wastes. Flood waters will be diverted around the landfill area to the historic point of discharge. In other words, a major flood will not enter the landfill areas and carry wastes downstream.

Along the site's eastern perimeter, adjoining the Agua Fria River, erosion protection will be added to the existing river bank. This bank protection as located and shown on Drawings 1 and 2, will prevent erosion of the river bank preventing flood waters from undercutting the site. It should be noted that this system provides protection for a very infrequent flooding, especially since construction of the new Waddel Dam upstream of the site controls the river flows.

3.3 ENVIRONMENTAL CONTROLS

This subsection describes the environmental control features planned for the site, in particular, leachate containment methods, including a base liner, a leachate collection and removal system, and landfill gas control.

3.3.1 Leachate Generation Potential

Leachate is produced when surface water, precipitation, or ground water is allowed to drain through wastes. The proposed site is located outside the 100-year flood plain, in an arid area where normal average annual precipitation is less than 8 inches, and current ground-water levels are approximately 290 feet beneath the natural ground surface. Additionally, the proposed landfill will be developed with a surface water drainage control system and capped with a final soil cover. Therefore, it is unlikely that leachate will be generated at the proposed landfill.

The potential for leachate generation during the postclosure period was evaluated using an EPA-developed model for evaluating rainfall infiltration through the final soil cover. This evaluation concluded that no infiltration through the final soil cover would occur for a select six-year period in which rainfall exceeds normal average precipitation by 0.9 inches (average 8.55 inches per year). Therefore, leachate generation should not occur during the landfill postclosure period.

3.3.2 Base Liner

The proposed landfill will be designed to include a synthetic composite base liner. In general, the synthetic composite base liner will be designed and constructed to protect the underlying ground water in the unlikely event that leachate is produced during any phase of the landfill life.

The base liner is a synthetic composite liner with the following components itemized from top to bottom:

- 1 foot minimum of protective soil cover (operations layer)

- Geotextile (8 oz/sq yd) to separate operations and drainage layers
- 1 foot minimum drainage layer
- 60-mil HDPE synthetic liner in direct contact with the low-permeability soil
- 3 feet minimum low-permeability soil liner

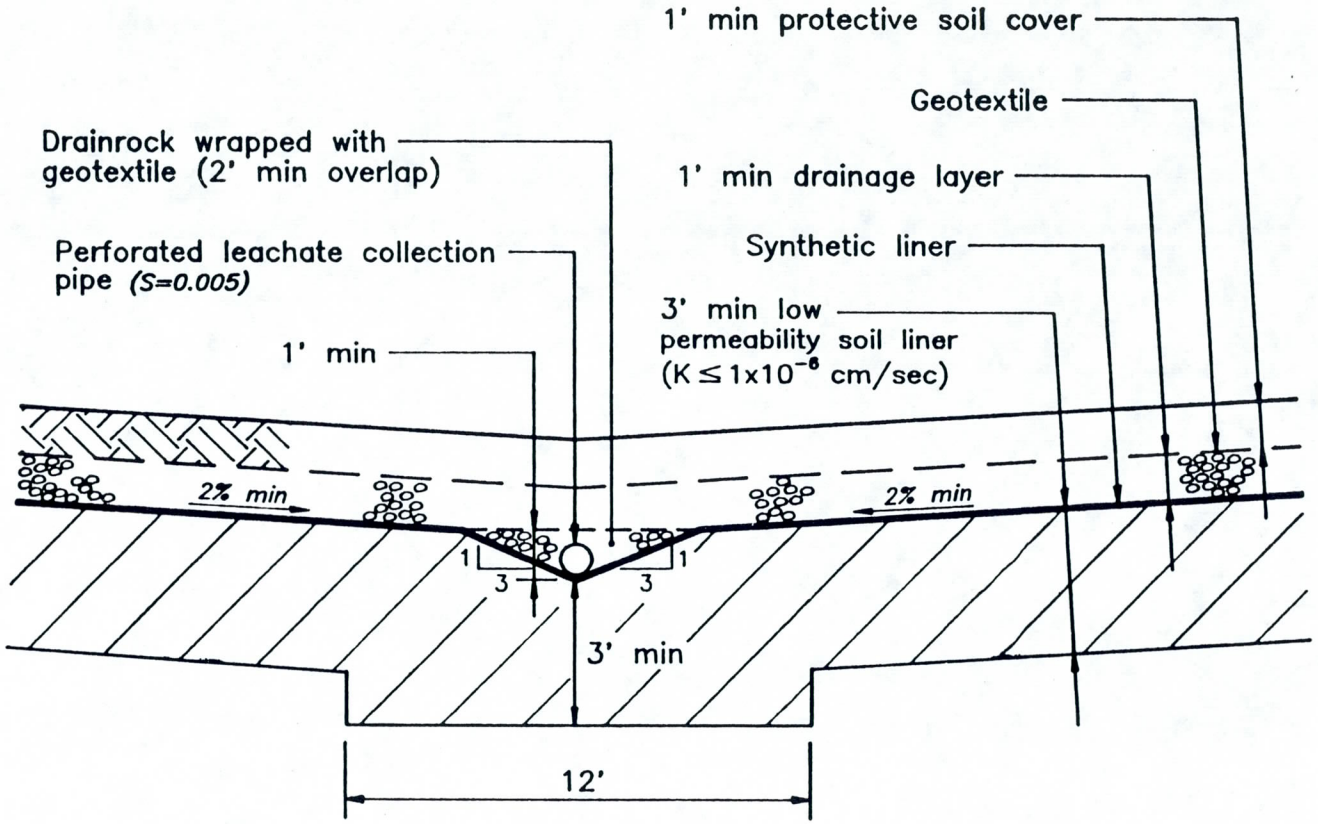
The excavation base will be constructed to develop a series of ridges and valleys so that the synthetic composite base liner as shown on Figure 6, will have contours that form a herringbone pattern. This pattern will facilitate the collection and removal of leachate, in the unlikely event it is generated, by directing the leachate flow to the exterior perimeter of the landfill.

3.3.3 Leachate Collection and Removal System

As an added precaution, the proposed landfill will be designed to include a leachate collection and removal system (LCRS) on top of the synthetic composite base liner. The LCRS will consist of a 1-foot (minimum) blanket drainage layer, leachate collection drains, and leachate collection sumps constructed at the base of the landfill. Installation of vadose zone monitoring probes is proposed beneath the sumps to allow for early detection of leachate migration from the base of the landfill. The LCRS will be placed directly on top of the synthetic composite liner to prevent any leachate head buildup, and together with the 1-foot (minimum) soil operations layer will protect the synthetic composite liner from damage during landfilling (see Figure 6).

3.3.4 Landfill Gas Control

Although landfill gas generation is unlikely to be a problem because of the arid environment, a gas migration control system will be developed to prevent landfill decomposition gases from migrating beyond the perimeter of the site. To verify the effectiveness of the control system, gas monitoring probes will be strategically placed along the property boundary and adjacent to on-site structures to allow detection of any subsurface methane gas movement.



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PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

BASE LINER SYSTEM AND LEACHATE COLLECTION DRAIN

FIGURE
6

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3.4 GROUND-WATER ISSUES

The WSRV has experienced severe ground-water depletion, which has resulted in water level declines of 200 to 300 feet between 1923 and 1977. Due to the continuing decrease in agricultural acreage and the heightened awareness of the need for ground-water conservation, water levels are anticipated to gradually stabilize.

3.4.1 Ground-Water Quality

Ground water in the WSRV is generally suitable for most agricultural and industrial uses. Locally high concentrations of dissolved solids (TDS) and fluoride can make most of the water unsuitable for domestic use.

In the site area, water is generally of the sodium-bicarbonate or magnesium-bicarbonate type with TDS concentrations averaging about 300 to 400 mg/l.

3.4.2 Ground-Water Use

One active well is located on site and is used as a source of irrigation water. There is one domestic water supply well within 1 mile downgradient of the site; further there are nine irrigation wells, two industrial supply wells, and four monitoring wells within that same downgradient area.

3.4.3 Natural Ground-Water Protection Features

The potential for ground-water contamination at the site is minimal because it has natural ground-water protection features including the following:

- The depth to ground water, from existing ground surface, under the proposed site was approximately 290 feet in December 1988. Depth to water is anticipated to remain stable.
- Potential for leachate generation is minimal because the average annual rainfall is less than 8 inches and the average annual Pan-A evaporation is over 80 inches.

- No earth fissures exist within, or in the immediate vicinity of the proposed site (based on wind photographic analysis, literature searches and seismic testing).

3.4.4 Engineered Ground-Water Protection Features

The potential for landfill-generated leachate and the subsequent potential of ground-water contamination is minimal. This is due to the natural features of the site and the engineered features that will be incorporated into the landfill design to further minimize any possibility of significant leachate generation or ground-water contamination. The engineered features to be incorporated are

- The proposed landfill design will include a synthetic composite base liner and leachate collection and removal system to prevent leachate migration.
- The completed landfill will be covered with at least 4 feet of soil, and vegetated to minimize rainwater infiltration into the refuse fill.
- Temporary and permanent drainage facilities will be incorporated to control erosion, prevent water ponding on the refuse fill, and minimize the amount of rainwater entering the refuse fill area.
- Perimeter berms and bank protection along the Agua Fria River will prevent flood waters from inundating or undercutting the site.

3.4.5 Landfill Operation Features for Ground-Water Protection

To further minimize possible leachate generation, and subsequent ground-water contamination, the following requirements will apply to on-site operations:

- No liquid wastes (water content exceeding 50 percent), sludges or hazardous wastes will be accepted for disposal at the proposed landfill
- Annual operations plans will be developed to assist with necessary preparations for wet weather operations, and to provide guidance for carrying out the intent of the design plans on a timely basis.

3.5 ENVIRONMENTAL MONITORING

The Environmental Monitoring System will consist of gas and ground-water monitoring. The gas system consists of detection probes to verify that lateral migration of landfill gas is not occurring. The ground-water monitoring program

consists of a multileveled monitoring system. This multileveled system starts with maintenance of the site to prevent liquids from entering the site, and then progresses to (1) a leachate detection system to determine if liquids are present, (2) a leak detection system to determine if the liquids are contained, and (3) a ground-water monitoring program to detect any change in the area's water quality.

If the monitoring systems detect leakage, or if additional ground-water protection features are required during the life of the landfill, BFI can install protective caps, including liners, on the top of the waste area to prevent any water form entering the refuse, and causing leachate migration. In addition, an extraction system could be installed to remove any leaked leachate long before it reaches the ground water. The protection of ground water will be an ongoing process throughout the life of the landfill. Monitoring to ensure such protection will continue for at least 30 years after closure of the landfill.

3.5.1 Landfill Gas Monitoring

Gas probes installed adjacent to site buildings and along the property boundaries will be monitored for methane gas during landfill operations. Detailed records of all monitoring results will be maintained at the site to provide continuous proof that landfill gas is being controlled and is not posing a potential hazard. When fill operations are completed, the results of the monitoring program will be reviewed for the development of postclosure monitoring requirements.

3.5.2 Leachate Monitoring

Although the generation of leachate is not expected, the leachate collection and removal system is designed to quickly drain and remove any leachate that might be produced. This is accomplished by sloping the base of the landfill to central drain pipes which discharge into leachate collection sumps, from which leachate can be removed. The sumps will be monitored at least quarterly. If leachate is detected, the monitoring frequency will be increased to ensure the prompt removal of accumulated leachate. Any collected leachate will be disposed of in accordance with appropriate regulations.

3.5.3 Leak Detection Monitoring

A leak detection system will be installed to provide early warning of failure of the liner system, long before any leachate could migrate into the ground water. The monitoring system will be installed in the vadose zone under the leachate collection sumps. This system will be monitored quarterly for leachate leakage through the liner.

The detection of leachate in the monitoring system would require remedial action to determine the cause of the problem and its subsequent correction.

3.5.4 Ground-Water Monitoring

A ground-water monitoring program will be implemented at the site to verify that leachate is not migrating into the underlying ground water. This monitoring will be conducted on a quarterly basis, and the samples will be tested by a certified laboratory for compliance with primary drinking water standards, as established by Arizona Department of Health Services and Department of Environmental Quality. Analytical test results will be reviewed periodically for changes or trends in the ground-water quality caused by the sanitary landfill. If leachate is detected in the ground water, the state and federal governmental environmental protection agencies will enforce strict verification and remediation rules to correct the problem.

3.6 AIRPORT SAFETY

Due to the proximity of the site to Luke Air Force Base and to the Glendale Airport as shown earlier on Figure 1, the issue of a landfill acting as a bird attractor was evaluated. This evaluation covered (1) rules, regulations and policies associated with the location of landfills near airports, (2) the potential of a landfill in Maricopa County becoming a significant attractor for a bird population, and (3) the means of mitigating bird problems if they occur.

Federal Aviation Administration (FAA) Order 5200.5 requires a 10,000-foot separation from the end of runway to a landfill for airports handling turbojet

aircraft. Draft EPA regulations (40 CFR 258.10) will require similar separation. The proposed landfill site is outside the 10,000-foot restricted area and therefore, complies with current and proposed regulations.

The evaluation concluded that the proposed landfill lies outside of the restricted area around the airports, is compatible with adjacent land uses, and is located in a region where landfill-related birds do not exist in significant quantities. Therefore, the siting of a landfill in this area is considered appropriate.

3.7 ENTRANCE FACILITIES

The entrance area to the proposed BFI Sanitary Landfill is located near the center and along the western side of the proposed site. The entrance facilities will be screened from adjacent properties with landscaping improvements. The entrance facility as currently conceptualized is illustrated on Drawing 2.

The entrance facilities for the proposed landfill will provide access to three distinct functional areas: the landfill administration office, the gatehouse facility, and a maintenance building for servicing landfill equipment. Each of these facilities is described below.

3.7.1 Landfill Administration Office

Landfill administrative functions will be conducted in a separate office structure located at the western end of the entrance area. Parking will be located adjacent to the office structure for employees and visitors. An asphalt-paved road will provide direct access to the office area from the site entrance, bypassing the gatehouse facility.

3.7.2 Gatehouse Facility

The landfill gatehouse will be occupied by the facility's attendants. Two 70-foot-long truck scales will be located at the gatehouse for determining vehicle gross and tare weights. A separate small paybooth will accommodate an attendant serving the public.

3.7.3 Maintenance Building

The maintenance building for servicing the landfill equipment will be located at the northeast corner of the entrance facility. The maintenance building will be a steel structure of approximately 10,000 square feet, with a reinforced concrete floor slab and foundation. A perimeter apron of crushed aggregate will surround the maintenance building. Personnel facilities within the maintenance building will include lockers, showers, a lunchroom, and toilets.

Parking for site personnel, including equipment operators and laborers, will be located in the maintenance area. Landfill heavy equipment may be stored in the improved area around the maintenance building.

4.0 RELATIONSHIP TO SURROUNDING PROPERTIES

The site of the proposed landfill is within the City of El Mirage in a sparsely populated area used predominantly for agriculture and industry. The site of the proposed landfill is currently utilized as a quarry for sands and gravel. Adjacent property is zoned industrial or residential I-1, I-2 and R-1.

The isolation of this area is partially due to the physical barrier of the Agua Fria River which lies to the east of the site. The isolation of the area, together with another quarry operation to the south of the site, provides a suitable location for a landfill.

Adjacent properties to the north, west and south will be separated from the waste disposal facility by an extensive area developed as a natural buffer with overlapping, 5- to 8-foot-high berms, several hundred feet in length, interspersed with trees.

The landfill will be compatible with the adjacent land uses for the reasons listed below.

- An extensive buffer area adjacent to the landfill will create an environment compatible with the existing surrounding area.
- Landscaped berms along the northern, western and southern landfill perimeter, 5 to 8 feet in height, will provide a visual buffer for the facility.
- State-of-the-art design and operation will protect against environmental impairment.
- Landfilling is an excellent way to reclaim an unsightly quarry pit into a free draining site that could include recreational facilities such as jogging trails or park-like open space to fulfill community needs.

5.0 DEVELOPMENT PLAN

The proposed design, development and operation of the sanitary landfill will be integrated to provide an environmentally sound waste disposal facility. Regulatory requirements, operational necessities, disposal volumes, vector control, and postclosure use are all addressed in the development plans for the proposed site.

5.1 DESIGN, CONSTRUCTION, AND OPERATING PROVISIONS

The overall site will be continuously developed. This is commonly referred to as the progressive area method of landfill development. After a defined area of the landfill has been excavated to the designed elevation and grade, the synthetic composite base liner and leachate collection and removal system will be installed. When preparations are completed, and all requirements have been met, the area will be ready for refuse filling. Waste will then be spread and compacted in the excavated and prepared area. Cover material, taken from the next excavation area where it is readily available, is spread and compacted over the waste. Soil material not needed for daily cover is used to construct the primary screening berms or stockpiled and later used as final soil cover. This method will minimize double handling of excavated soils and allow nearby stockpiling of soils to reduce hauling distance. When excavation efforts in the next cell are complete, that module will be lined, the leachate collection and removal system installed, and the module landfilled. This process will continue until the landfill is completed.

Generally, modules to be lined and prepared will consist of approximately 10 to 15 acres. Refuse fill will be placed in the modules in lifts between 15 to 20 feet in height, and sloped at 3:1 along the width of the module (200 feet). This small working face will minimize direct infiltration of rainfall, and control vectors (insects, birds, rodents, etc.) and nuisance factors (odor, litter, etc.). Refuse will be spread and compacted in 2-foot-thick layers on the sloped working face. Compaction equipment will traverse the entire length of the working face and make several passes over each 2-foot-thick layer of refuse to provide adequate compaction of all wastes. Large or bulky wastes will be separated to prevent

bridging of the surrounding refuse, placed in the lower portion of the advancing lift and thoroughly crushed by compactor equipment. The advancing face will be covered daily with a minimum 6-inch layer of cover soil. When no additional waste materials is to be placed over the surface within 180 days, the top and side slopes of the advancing lift will be covered with a 12-inch layer of intermediate cover.

Final landfill slopes will be constructed no steeper than 4:1. The final grades will be no less than from 5 to 12.5 percent to provide sufficient slope for surface water runoff after anticipated settlement of the underlying refuse fill. The entire landfill will be sealed with a 4-foot-thick (minimum) final soil cover that will minimize infiltration of precipitation, and promote revegetation. The final cover will be placed and vegetated as individual increments of the landfill are brought to final grade. The final cover will be constructed in compliance with regulations and standards for closure, specified by the ADEQ.

Drainage structures, including ditches, berms and sedimentation basins, will control surface water runoff and prevent inundation or washout during landfill operations, and after landfill completion.

5.2 PREPARATION

Extensive development and preparations will be required before starting refuse filling at the landfill. The initial development will occupy approximately 1/3 of the site (approximately 70 acres), and will take place at the northern end of the site (see Figure 7). The initial development will include the site gatehouse, administrative and maintenance facilities, and the perimeter screening berm along the entire northern perimeter and along part of the western perimeter.

Excavation of the initial module will proceed in one continuous operation. The area will be excavated to approximately 82 feet below current ground level. The excavated soil, not used by the ongoing quarry operations, will be used to construct the perimeter screening berm, and to support other landfill development needs. Excess soil will be stockpiled on site. Only a portion of the initial module will be lined and prepared for refuse filling. The remainder of the initial module

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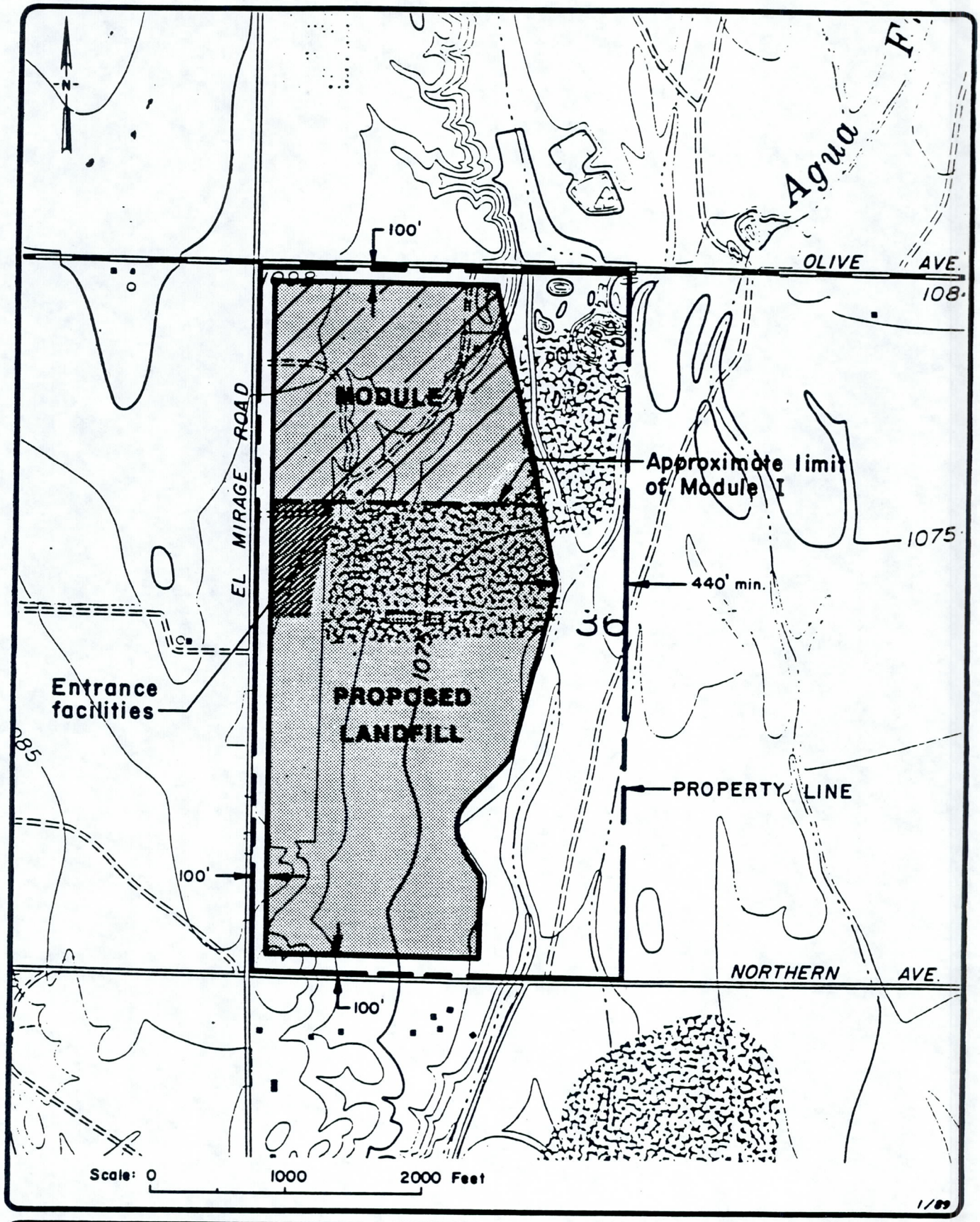

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PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

PROPOSED LIMIT OF MODULE I

FIGURE 7

PROJECT NO. 372-15.01

will be graded and slightly sloped, and provisions made for surface water to run off to a low area away from the area being refuse-filled. Temporary berms and drainage control facilities will be used to divert surface water away from the refuse fill areas.

5.3 CONTROL OF INCOMING WASTES

The site will be open for public and private disposal. Signs posted near the site entrance will clearly indicate that hazardous wastes are not accepted at the site, and state the penalty for illegal disposal. All vehicles delivering wastes to the site will be stopped and weighed at the gatehouse. Any vehicle suspected of carrying unacceptable materials (liquid waste, sludges, or hazardous waste) will be prevented from entering the disposal site area until the hauler can satisfy the landfill manager that the waste is acceptable for disposal at the site.

Vehicles will then be routed to the active disposal area and directed to the appropriate discharge location by site personnel. If a discharged load appears to contain hazardous or unacceptable material, the site personnel will order the hauler to reload and remove it from the landfill. Site personnel will be trained in the safe handling, control and disposal of hazardous wastes so that improperly placed hazardous waste can be transported and properly disposed of at an approved facility.

A load-checking program will be implemented at the landfill to focus on wastes delivered from commercial and industrial sources. A trained team will conduct periodic load-checking at the site. The team will examine from three to five random loads on a random day once per week. If hazardous or unacceptable wastes are discovered, the party responsible, if identifiable, will be billed for the removal and disposal of such wastes at an approved facility. The objective of load-checking is to detect and discourage attempts by large and small generators to unload prohibited wastes at the site.

5.4 NUISANCE CONTROL AND HEALTH CONSIDERATIONS

The following actions will be taken to minimize nuisance conditions.

5.4.1 Dust and Odor

Dust and odor will be controlled by (1) continuous attention to proper maintenance of haul roads (grading and watering); (2) application of a fine water spray on wastes and soil covered work areas when conditions cause the formation of fugitive dust; (3) timely placement of daily, intermediate, and final soil cover over the refuse fill; (4) application of water or planting of temporary vegetative cover on intermediate soil cover when conditions might cause fugitive dust; and (5) planting and maintenance of a vegetative cover on completed fill slopes. The low-permeability clay soils to be used in the final landfill cover will effectively control odors at the completed landfill.

5.4.2 Litter

Litter will be controlled by keeping the working face of the landfill as small as practical and by placement of temporary fencing or portable litter fences downwind from the working face. The fencing, the operational area, and the site in general will be inspected daily and any accumulated litter will be collected.

5.4.3 Birds and Rodents

Timely placement of daily, intermediate, and final soil cover over the refuse fill is usually effective in preventing birds and rodents from feeding on it. Additionally, maintaining a small working face in daily refuse fill operations advances the working face several feet each day and effectively eliminates harboring rodents.

5.4.4 Traffic

Information and direction signs will be placed on the primary routes to the landfill. Signs to inform highway traffic of the landfilling operation will be placed at least 500 yards from the landfill entrance and will notify traffic travelling in both directions.

All large disposal vehicles entering the landfill are required to stop and be weighed at the scale house. This building is located several hundred feet from

the El Mirage Road turnoff providing an adequate stacking lane for vehicles queued to enter the facility.

The gatehouse attendant will initially direct each vehicle to the proper disposal area. An employee at the disposal area will direct traffic and ensure smooth operation.

5.4.5 Noise

Noise levels of on-site equipment will be controlled by proper maintenance of mufflers.

5.4.6 Health and First Aid

The following will minimize possible health hazards to site operating personnel:

- Identifying wastes at the scale and minimizing exposure to any waste that may present a health hazard to operating personnel
- Maintaining on-site first aid supplies, and training site personnel in safe operating procedures and compliance with operating provisions

5.5 SITE OBSERVATION AND MAINTENANCE

Surface drainage facilities, final vegetated soil cover areas, intermediate fill surfaces, and on-site access roads will be observed routinely, and at least weekly during high-intensity rainfall periods. Necessary repairs will be done promptly. Ditches, temporary berms, straw mulch, or other erosion control measures will be used to prevent further erosion damage of soil covered areas until weather conditions permit replacement and reseeding of eroded soil.

As stated before, when landfill areas are filled to final grade, the compacted soil cover will be capped with available topsoil, fertilized, and seeded to establish vegetation. A regular maintenance program will be established in completed areas to provide proper drainage of the fill surface, maintenance of the vegetative cover, and preservation of the soil cover's integrity. The primary concerns of the

maintenance program will be sealing cracks caused by settlement and repairing erosion damage that may result from heavy rainfall.

5.6 SITE SIZE, CAPACITY AND SERVICE LIFE

The proposed landfill size and estimates of waste capacity, landfill service life, and earthwork requirements are presented in Table 1. The site has an estimated refuse capacity of approximately 2 6 million cubic yards, and a site life of over 18 years based upon an estimated initial disposal rate of 2,200 tons per day, 286 operating days per year and with an annual 3 percent increase. However, the exact waste quantities received at the site will depend on the actual service area and disposal market. The actual waste volume could vary from the estimated amount, thus decreasing or increasing the site life projection as shown.

5.7 RECLAMATION

The intent of the landscape and reclamation plan is to restore the site to a natural desert state, and to provide functional and aesthetic visual qualities to those who use the site, or pass by it.

The Landscape Plan takes into account all landscaping, berming and other amenities associated with the perimeter site improvements (see Drawing 3). The Reclamation Plan addresses completion of the berming and landscaping (see Drawing 4).

As shown on Drawings 3 and 4, the entrance area at the western perimeter of the site which is more visible to, and more actively used by the public, will also be attractively landscaped. This entrance area landscaping will include trees, shrubs and ground covers, with watering provided by an underground automatic drip irrigation system. These additional trees and shrubs will provide a visually pleasing and functional landscape.

There will be a buffer area adjacent to the operating landfill along Olive Avenue, El Mirage Road and Northern Avenue. In this buffer area, a series of berms 5 to

Table 1

SITE SIZE, CAPACITY, SERVICE LIFE AND EARTHWORK REQUIREMENTS CHOLLA SANITARY LANDFILL

Item Description	Quantity
Parcel Size	320 acres
Landfill Size	196 acres
Capacity (cubic yards)	
Total Fill Space	33,059,300 c.y.
Refuse Capacity[1]	25,738,700 c.y.
Refuse Weight[2]	15,443,200 tons
Service Life[3]	+18 years
Earthword (cubic yards)	
Daily and Intermediate Soil Cover[1]	6,434,700 c.y.
Final Soil Cover	885,900 c.y.
Soil Liners	921,700 c.y.
Primary Screening Berm	400,000 c.y.
Secondary Screening Berm	303,700 c.y.
TOTAL SOIL NEEDED	8,946,000 c.y.

1. Based on volume ratio of 4:1 (refuse to daily and intermediate soil cover.
2. Based on in-place refuse density of 1,200 lbs/c.y.
3. Based on an average refuse fill rate of 2,200 tons per day, 286 days per year, with an estimated 3 percent annual increase.

8 feet high, located near the property line, will be provided. Different varieties of native and indigenous trees will be planted on the outboard side of the berms.

The southern portion of the site will not be utilized initially and will be left for continued quarry operations. No landscaping or screening will be provided in this area until the remainder of the landfill is developed.

When the site is closed for operations, the final surface area will be seeded with a mix of native shrubs, grasses and perennials, during the rainy season, to assure germination of the seed.

5.8 END-USE CONSIDERATIONS

Although the end use for the proposed site has not yet been established, the development plan will create an aesthetically pleasing, free draining surface suitable for various uses. If desired by the surrounding community, the area can be incorporated into the regional linear park that is planned for the Agua Fria River corridor or developed and utilized as a community park.

6.0 TRAFFIC CIRCULATION SYSTEM

The landfill entrance facilities will be located near the middle of the western site perimeter. Two separate access routes will be used to access the landfill site from El Mirage Road. Initially, when landfilling operations are in progress at the northern end of the site, a newly constructed access road would be used to allow direct movement through the gatehouse to the active landfill. Later, when the southern end of the site is being landfilled, the existing quarry access road will be improved and used to again provide direct movement through the gatehouse.

6.1 ON-SITE TRAFFIC

Commercial collection vehicles, transfer vehicles, and other large trucks will be directed to the gatehouse facility to determine their gross weight. Vehicles on account at the landfill will have their tare weights on record at the gatehouse, eliminating the need to determine their empty weights as they exit the site. Upon leaving the gatehouse, vehicles will proceed directly to the landfill face.

The public and pickup-sized commercial vehicles will be assessed a disposal fee based on volume. A separate lane and toll booth will be provided to accommodate public traffic during peak weekday hours and on weekends. Upon leaving the gatehouse area, the public will be directed to the landfill face. If necessary, a separate drop-off facility will be constructed near the landfill entrance to accommodate public disposal.

Access to the landfill administration office will be on an asphalt- paved road, either from the site entrance or from the landfill/maintenance building areas. A total of twenty-four parking spaces will be provided in lots to accommodate parking of staff and visitors. The perimeter of the maintenance building will be surfaced with crushed aggregate to provide an all-weather surface for access, maneuvering, and parking of landfill equipment. Parking for equipment operators and maintenance personnel will be provided in this area.

6.2 OFF-SITE TRAFFIC

The largest single source of truck traffic bringing waste to the Cholla Sanitary Landfill will be semi-trailers from the central Phoenix waste transfer station. The route for this traffic should be direct, use high capacity roads designed to stringent safety standards, and avoid residential neighborhoods, schools, and pedestrian-oriented retail centers wherever practical. The best choice of routes for the traffic would be the I-10 Freeway and the Agua Fria Freeway when completed. Before the completion of the Agua Fria Freeway between Glendale Avenue and I-10, truck traffic should be routed over 99th Avenue (see Figure 8). This is a 4-lane roadway with traffic signals at major intersections which already carries heavy truck traffic. Construction of the Agua Fria Freeway is located east of the 99th Avenue right of way, and will not interfere with traffic along 99th Avenue. The primary access route will utilize roadways appropriate in width and pavement type for the proposed traffic (see Figure 8).

An analysis of the area traffic for the proposed site, performed by Howard Needles Tammen & Bergendoff (HNTB) arrived at the following conclusions:

- Current traffic on streets and highways accessing the Cholla Sanitary Landfill is significantly less than the capacity of these facilities. There is little or no current traffic congestion.
- Several freeway construction projects and other roadway improvements, which will contribute to an easy access to the site, are programmed by the Arizona Department of Transportation and local governments.
- The total number of truck trips to and from the Cholla Sanitary Landfill during the peak traffic hour of the peak traffic weekday in the year 2008, is a very small fraction of the total traffic on adjacent roadways.
- Truck traffic to and from the Cholla Sanitary Landfill will add no more than 5 percent to the total traffic on El Mirage Road, and no more than 1 percent to traffic on any other roadway in the west valley.
- The primary access route for all transfer trucks and direct haul waste trucks serving areas south of the site is along El Mirage Road, Glendale Avenue, and 99th Avenue, or the Agua Fria Freeway. This route provides a high-capacity route designed to accommodate high volumes of truck traffic without intruding on

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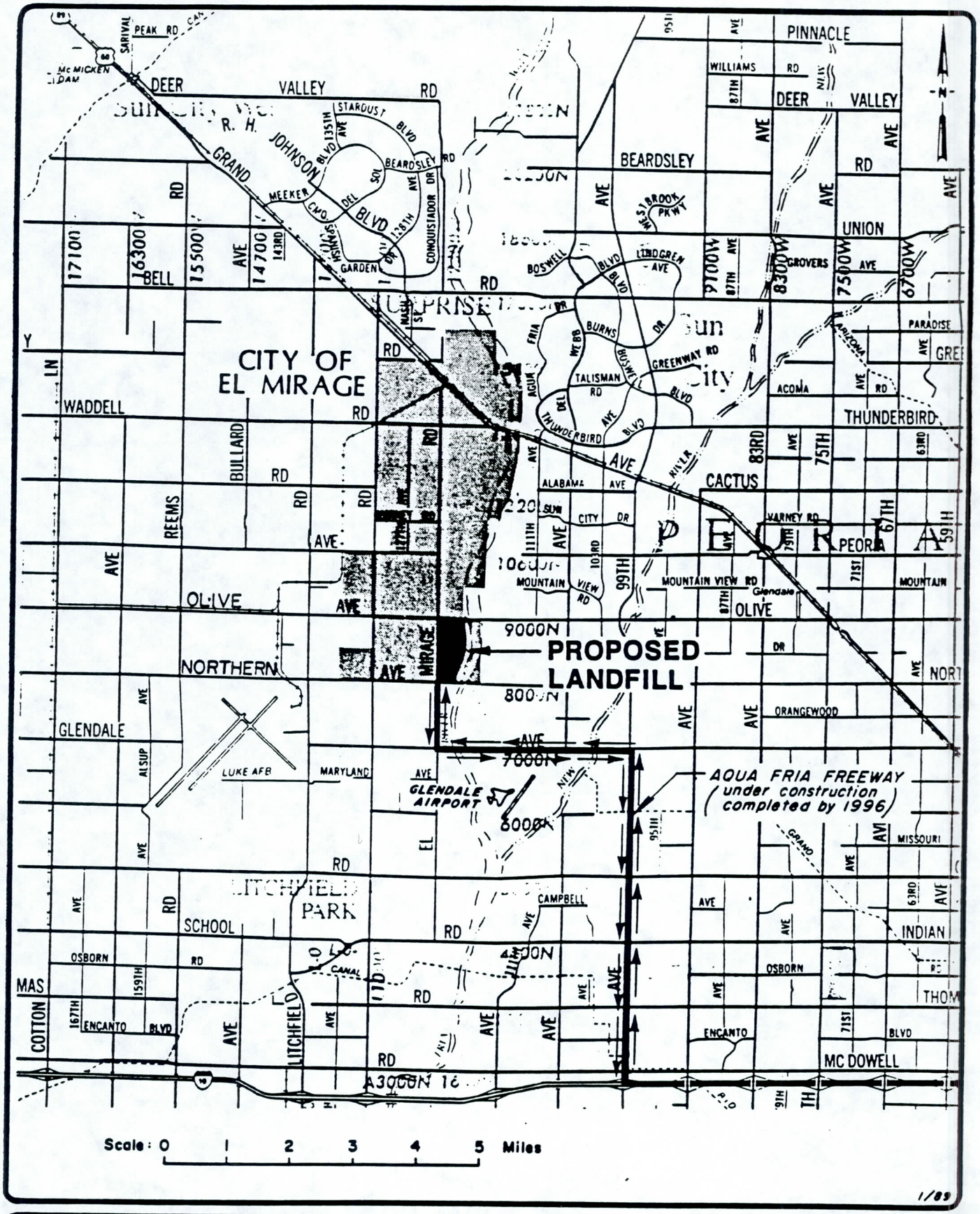

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PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

SITE ACCESS MAP

FIGURE 8

PROJECT NO. 372-15.01

residential areas, school zones, or pedestrian-oriented retail centers.

- Planned roadway improvements to Glendale Avenue and the Agua Fria Freeway will improve pavement and roadway design for truck traffic.
- Truck traffic to the Cholla Sanitary Landfill does not measurably add to traffic congestion levels on west valley arteries.

7.0 PUBLIC UTILITIES AND SERVICES

7.1 UTILITIES

The utilities and services listed below are available for the proposed landfill operations.

7.1.1 Water

Potable and nonpotable water may be provided through the use of an existing on-site well. The overall requirement for water to support the proposed landfill and the existing quarry operation will be larger than the current demand to support the quarry operation alone.

7.1.2 Sewer

A sewage septic tank and leach field for sewage disposal will be required to support landfill operations. This design will be incorporated in the preliminary landfill development plans.

7.1.3 Gas

Natural gas will not be required at the site.

7.1.4 Electricity

Salt River Project will provide electricity to the site. Service is provided through existing utility poles located at the site.

7.1.5 Telephone

U.S. West Communications will provide telephone service.

7.2 SERVICES

7.2.1 Law Enforcement

The City of El Mirage Police Department will provide police protection.

7.2.2 Fire Protection

The City of El Mirage Fire Department will provide fire and ambulance service to the site. The landfill will be designed to meet or exceed state and local standards as approved by the City of El Mirage Fire Marshall.

7.2.3 School Facilities

The proposed landfill lies within the City of El Mirage School District.

7.2.4 Community Facilities and Services

The City of El Mirage is equipped to offer its residents complete health care and commercial services.

8.0 SPECIAL PERMIT REQUIREMENTS

Additional permitting will be required before operation of the proposed Cholla Sanitary Landfill can begin. The key permitting items are outlined below.

8.1 ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ)

The ADEQ regulates the disposal of waste to land and will require issuance of an Aquifer Protection Permit and a Solid Waste Disposal Operation Plan before disposal activities are allowed to begin. To apply for these permits, appropriate applications and technical reports must be filed. These technical reports will include (1) a Geologic/Hydrogeologic Report and Ground-Water Monitoring Plan, and (2) an Engineering Master Plan. The Geologic/Hydrogeologic Report and Ground-Water Monitoring Plan will provide information on regional as well as site-specific geologic/hydrogeologic features. Based upon this information, a ground-water monitoring program will be proposed for the site. The Master Plan will cover design, operation, closure and postclosure of the site.

8.2 OTHER PERMITS

Although the most significant permits will be obtained from the ADEQ there are other permit and approval requirements, from various agencies, such as the permit for the installation of the necessary ground-water monitoring wells, to be issued by the Arizona Department of Water Resources, and the building permits, to be issued by the City of El Mirage.

N

APPROXIMATE PROPERTY BOUNDARY

Agua Fria River

440' min.

APPROXIMATE 100-YEAR FLOOD BOUNDARY

Existing river bank with erosion protection added

See Detail (4/12)

OLIVE AVENUE

NORTHERN AVENUE

Sedimentation basin

8:1 min. 4:1 max.

100'

5% minimum 12.5% maximum

ENTRANCE FACILITIES (5/12)

EL MIRAGE ROAD

LIMIT OF REFUSE FILL

Sedimentation basin

On-site drainage ditch (typ.)

Off-site drainage ditch (typ.)

Sedimentation basin

LEGEND

- Approximate property boundary
- Limit of refuse fill
- Approximate 100-year Flood boundary
- On-site drainage pitch
- Off-site drainage pitch

Scale: 0 200 400 600 800 Feet
1"=200'

REGISTERED PROFESSIONAL ENGINEER — JAMES H. LORD — ARIZONA, U.S.A. — DATE SIGNED 2/1/89

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
DATE OF ISSUE FEB. 1989		DWN BY P.M.M. DES BY Paul W. Lindsey	CHK BY APP BY			

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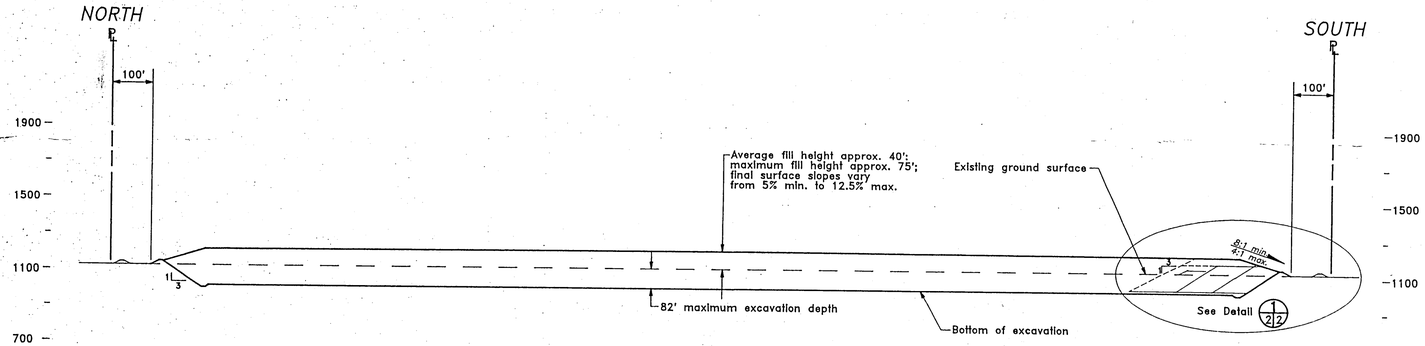
BROWNING-FERRIS INDUSTRIES OF ARIZONA, INC.
PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

FINAL GRADING PLAN

DRAWING NO. 1

PROJECT NO. 372-15.01

NOT FOR CONSTRUCTION



TYPICAL LANDFILL SECTION

SECTION A/2/2

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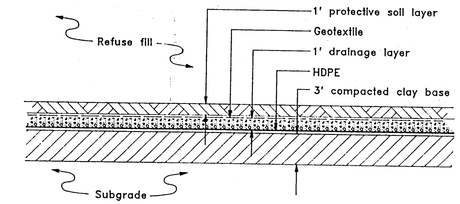

LINER SYSTEM DETAIL 3/2/2

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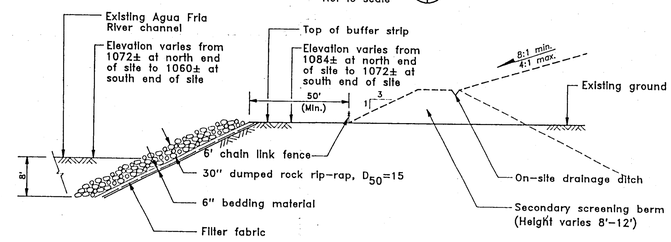
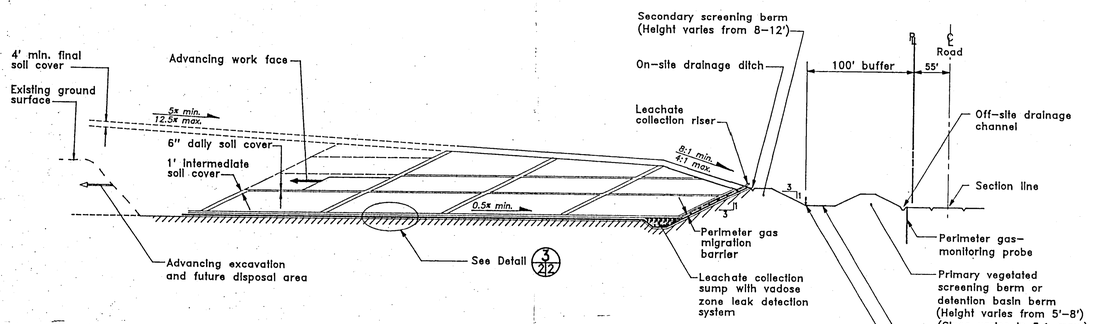


LANDFILL PERIMETER WITH TYPICAL BANK PROTECTION (East side)

DETAIL 4/1/2

Not to scale



LANDFILL PERIMETER (Typical, North, South and West sides)

DETAIL 1/2/2

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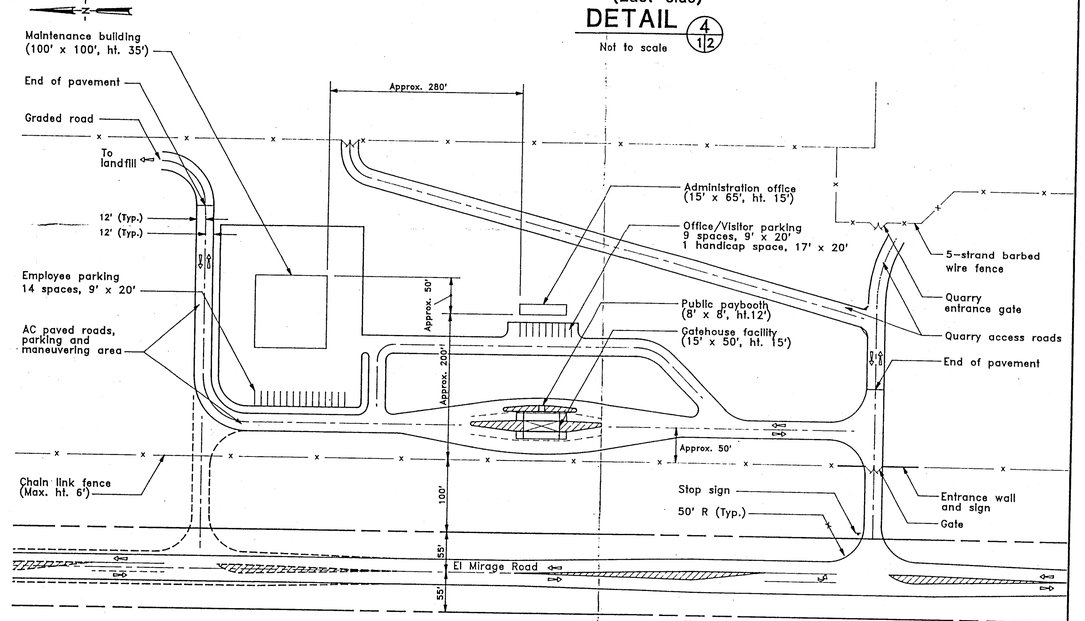
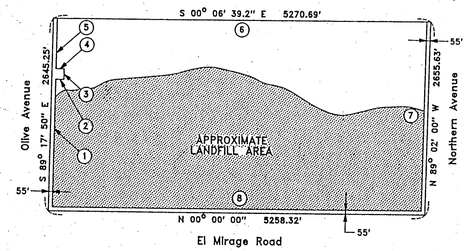


ENTRANCE FACILITIES DETAIL 5/1/2

Scale: 1" = 100'

0 100' 200'



CONDITIONAL USE PERMIT AREA

DETAIL 2/2/2

Not to scale

DISTANCE TABLE

	Bearing	Distance
1	S 89° 17' 50.0" E	1745.25'
2	S 00° 06' 39.2" E	115.01'
3	S 89° 17' 50.0" E	150.02'
4	N 00° 06' 39.2" W	115.01'
5	S 89° 17' 50.0" E	695.09'
6	S 00° 06' 39.2" E	5160.67'
7	N 89° 02' 00.0" W	2600.52'
8	N 00° 00' 00.0"	5148.56'

ACREAGE

Gross:	320.2829 acres
Net:	306.6933 acres
Approximate landfill area:	196 acres

NOTES:

1. Heights shown are approximate.
2. Signs identifying the landfill operation will be placed along primary access roads approximately 500 yds. from the landfill entrance.
3. Equipment may be stored in improved area around maintenance building.
4. Planned improvements for filling of southern end of site shown with dotted lines.

REGISTERED PROFESSIONAL ENGINEER — JAMES M. LORD — DATE 3/1/89 — ARIZONA, U.S.A.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
DATE OF ISSUE		DWN BY K. Troyer			CHK BY Paul W. Lindsey	
February 1989		DES BY			APP BY	

EMCON Associates

BROWNING-FERRIS INDUSTRIES OF ARIZONA, INC.
PROPOSED CHOLLA SANITARY LANDFILL
EL MIRAGE, ARIZONA

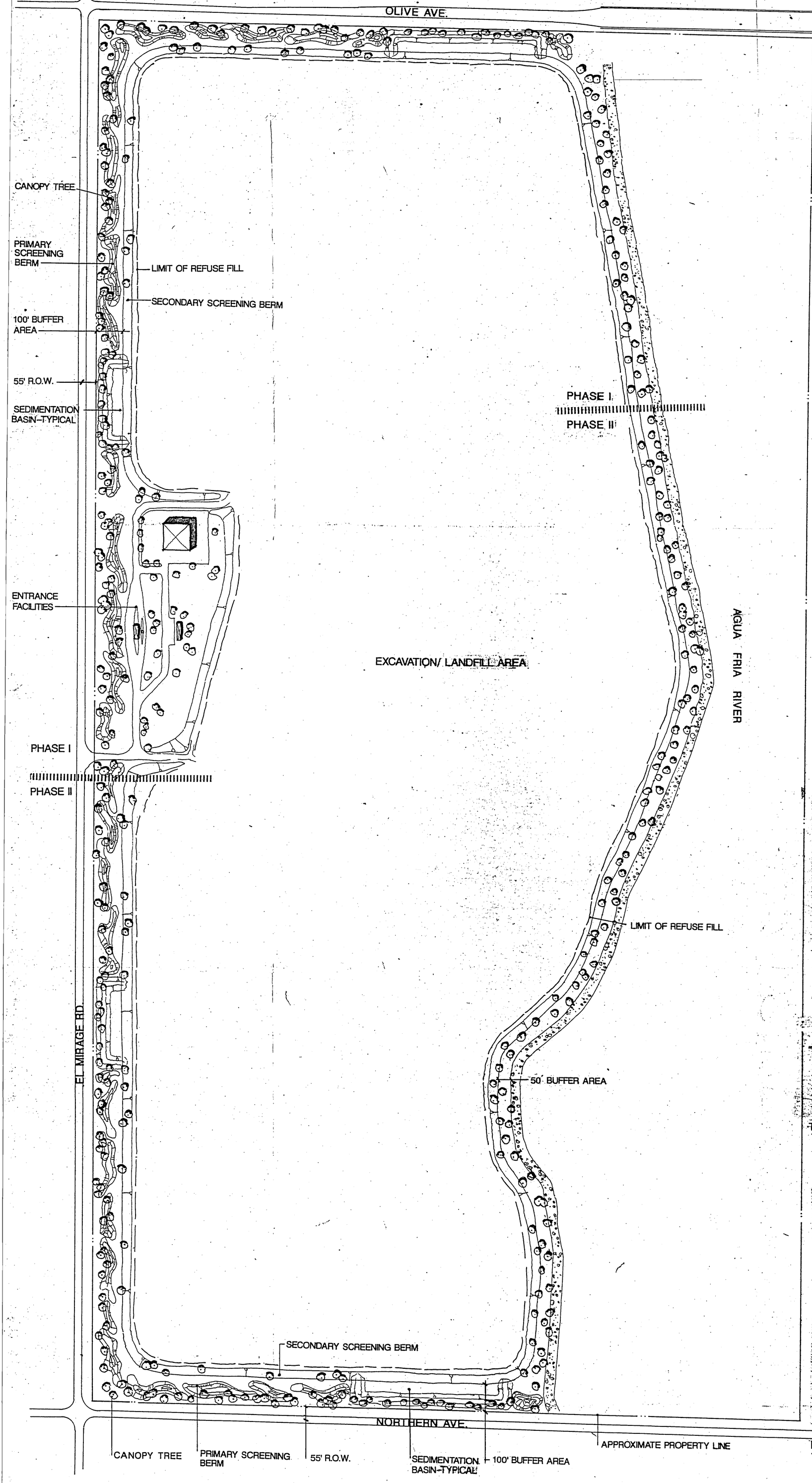
SECTIONS AND DETAILS

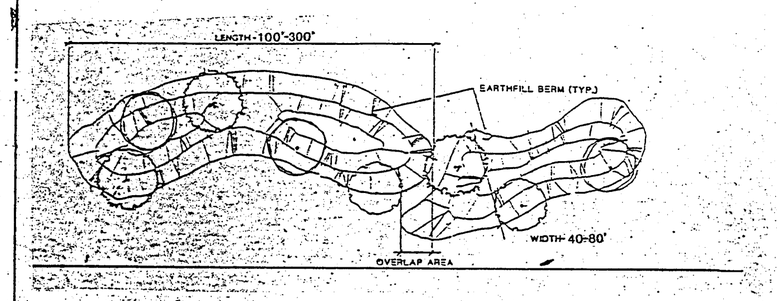
DRAWING NO. 2

PROJECT NO. 372-15.01

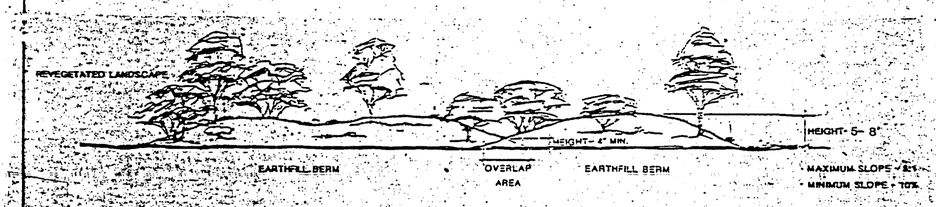
NOT FOR CONSTRUCTION

01/31/89 15:39:25 kit:372/mirage_detail_sheet1





PLAN VIEW-TYPICAL BUFFER AREA



TYPICAL ELEVATION

SIZE	%	BOTANICAL NAME	COMMON NAME
5 GAL	20%	ACACIA SMALLII	SWEET ACACIA
5 GAL	25%	CERCIDIUM FLORIDUM	BLUE PALO VERDE
5 GAL	10%	EUCALYPTUS SALMONOPHLOIA	SALMON GUM
5 GAL	30%	PROSOPIS ALBA	ARGENTINE MESQUITE
5 GAL	15%	PROSOPIS JULIFLORA	ARIZONA MESQUITE
1 GAL		ACACIA REDOLENS	TRAILING ACACIA
1 GAL		CASSIA NEMOPHILA	DESERT CASSIA
1 GAL		CAESALPINIA MEXICANA	MEXICAN BIRD OF PARADISE
1 GAL		ENCELIA FARINOSA	BRITTLE BUSH
1 GAL		ERICAMERIA LARICIFOLIA	TURPENTINE BUSH
1 GAL		LARREA TRIDENTATA	CREOSOTE BUSH
1 GAL		LEUCOPHYLLUM LAEVIGATUM	CHIHUAHUAN SAGE
1 GAL		PENNISETUM SETACEUM	FOUNTAIN GRASS

ALL PLANT MATERIAL SHALL HAVE SUPPLEMENTAL WATER PROVIDED TO THEM BY AN AUTOMATIC UNDERGROUND DRIP IRRIGATION SYSTEM

PLANT SCHEDULE

NORTH

0' 100' 200' 400' 600' 1"=200'-0"

LANDSCAPE PLAN

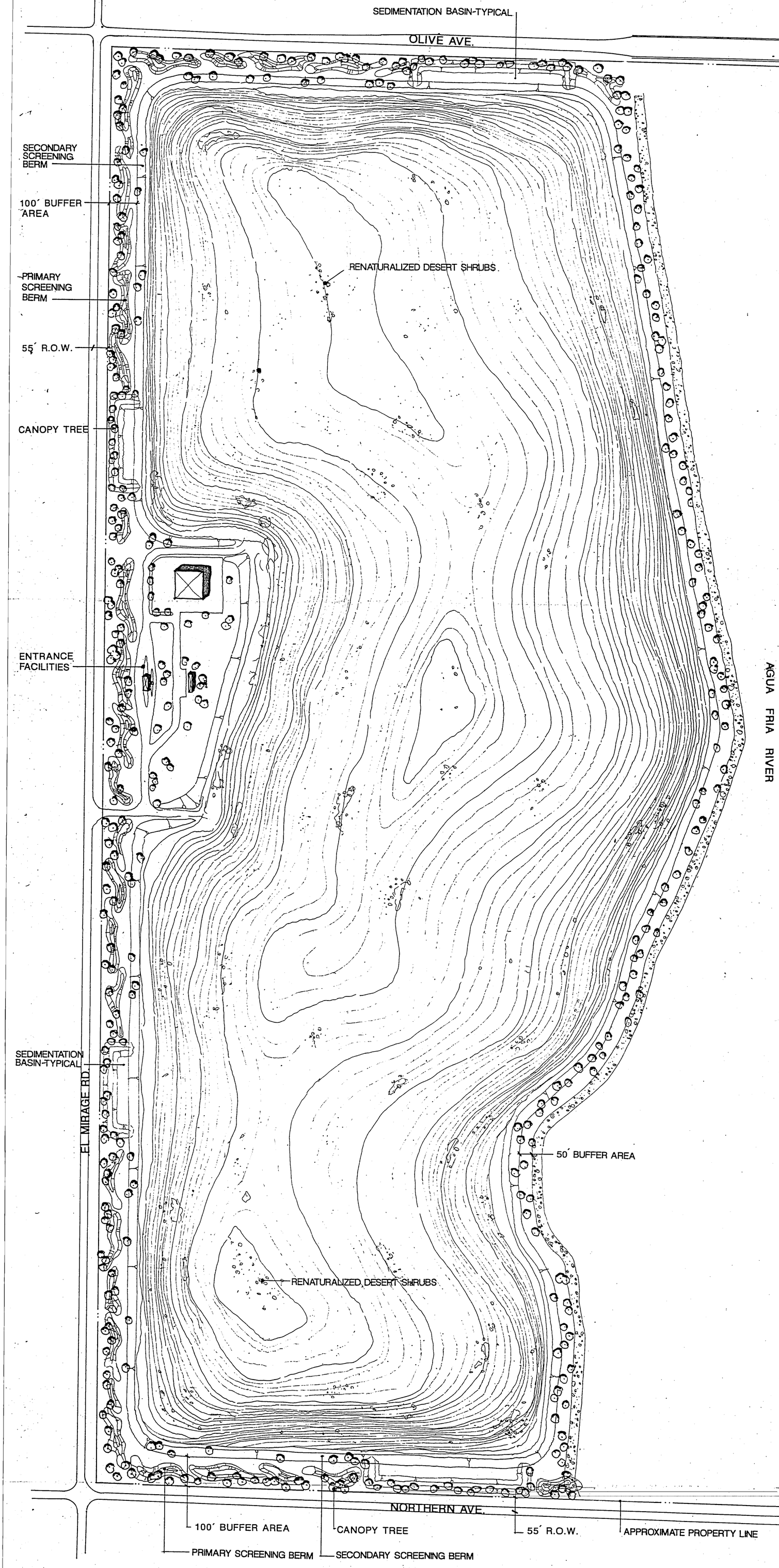
CHOLLA SANITARY LANDFILL

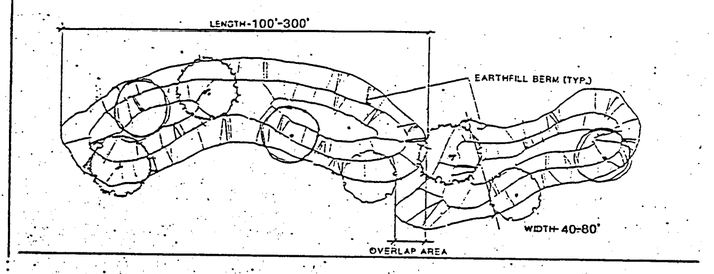
BROWNING- FERRIS INDUSTRIES

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

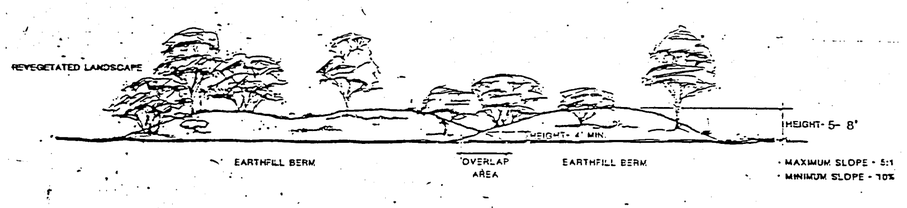
JANUARY, 1989 12523.99.02

DRAWING 3





PLAN VIEW- TYPICAL BUFFER AREA



TYPICAL ELEVATION

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1 GAL		ACACIA REDOLENS	TRAILING ACACIA
1 GAL		CASSIA NEMOPHILA	DESERT CASSIA
1 GAL		CAESALPINIA MEXICANA	MEXICAN BIRD OF PARADISE
1 GAL		ENCELIA FARINOSA	BRITTLE BUSH
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1 GAL		PENNISETUM SETACEUM	FOUNTAIN GRASS

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PLANT SCHEDULE

NORTH

0' 100' 200' 400' 600' 1"=200'-0"

RECLAMATION PLAN

CHOLLA SANITARY LANDFILL

BROWNING- FERRIS INDUSTRIES

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS

JANUARY, 1989 12523.99.02

DRAWING 4