Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2600 PROSPECT N.E. · ALBUQUERQUE, N.M. 87107
TELEPHONE (505) 884-2215

October 22, 1990

Howard Stone
Bohannan-Huston, Inc.
Journal Center Courtyard I
7500 Jefferson Street N.E.
Albuquerque, New Mexico 87109

Re: FEMA Flood Map Revisions - North and South La Cueva Arroyos, West of Interstate 25

Dear Howard:

The following services are requested as a part of our Engineering Services Agreement for "FEMA Flood Map Revisions".

a. Description of service/task desired.

AMAFCA has constructed channel improvements at the North and South La Cueva Arroyos between Interstate 25 and the North Diversion Channel. In addition, several recent subdivisions and Jefferson Street now divert stormwater flow to the La Cueva Arroyo. These improvements are not reflected on the existing National Flood Insurance Program "Floodway Map" and "Flood Insurance Rate Map". The maps need to be updated by AMAFCA and submitted to the Federal Emergency Management Agency for review and approval. The area to be included in the map revision is bounded on the south by Alameda Boulevard, on the north by San Diego Avenue, on the east by Interstate 25, and on the west by the North Diversion Channel. The map revisions will need to consider the upstream areas east of Interstate 25. Existing and future upstream development should be included in the analysis. The impact of sediment must be included in the analysis. Of particular concern is the flow which currently reaches the existing earth channel between Alameda Boulevard and the La Cueva Arroyo. Storms larger than the 100-year storm (SPF) must be considered in order to satisfy U.S. Army Corps of Engineers criteria.

b. Map showing project location.

A map showing the project area is enclosed.

c. Fee basis preference.

We anticipate that substantial portions of this project should be accomplished on a lump sum fee basis. Coordination with FEMA and some site testing may require a unit price fee.

d. Requested date of completion.

It is anticipated that the initial submittal to FEMA should be completed within 90 days after receipt of notice to proceed. Completion of the project may depend on the additional requirements established by FEMA during their review of the initial submittal.

e. Other items:

It is anticipated that this work will require coordination with the City/County Floodplain Administrator. Enclosed are letters from FEMA to the City of Albuquerque dated March 8, 1990, May 8, 1990 and May 11, 1990. These will provide you with further information on the criteria currently being considered by FEMA.

Please let me know if you have any questions regarding preparation of a "Project Proposal". AMAFCA's contact on this project will be Clifford Anderson.

Sincerely,

Larry A. Blair, PE
Executive Engineer

cc: Fred Aguirre, Hydrologist, City of Albuq.,Public Works Dept.
Gilbert Aldaz, City/County Floodplain Administrator

KEN SCHULTZ
MAYOR

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

E 4

February 21, 1989

PROJECT ACCEPTANCE LETTER

Mountain States Constructors, Inc.
P.O. Box 6098
Albuquerque, NM 87197

RE: SOILS AMENDMENT FACILITY ACCESS ROAD AND SITE IMPROVEMENTS, PROJECT NO. 3406

Dear Gentlemen:

The above referenced project has been completed according to the plans and specifications. The project consisted of approximately 18,000 linear feet of two-lane rural roadway, drainage culverts, and earthwork.

The City of Albuquerque accepts the referenced project as a whole and the contractual correction period began September 28, 1988. The correction period on this project is for three (3) years.

Sincerely,

Russell B. Givler, P.E.
Chief Construction Engineer
Construction Management Division
Engineering Group
Public Works Department

RG:tp
INP137151

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

KEN SCHULTZ
MAYOR

March 24, 1989

Kent S. Freier, P.E.
Molzen-Corbin & Associates, Inc.
2701 Miles Road, SE Suite 100
Albuquerque, New Mexico 87106

RE: CERTIFICATION FOR SOILS AMENDMENT FACILITY
PHASE 2B-3 CONTRACT #4 (E-4)
ENGINEER'S STAMP DATED MARCH 14, 1989

Dear Mr. Freier:

Based on the information provided on your submittal of March 14, 1989, Certification for the referenced drainage plan is acceptable.

If I can be of further assistance, please feel free to call me at 768-2650.

Cordially,

/Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj
(WP+383)

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Louis Saavedra
MAYOR

December 13, 1989

Jackie S. McDowell, P.E.
Molzen-Corbin & Associates, Inc.
2701 Miles Road, SE Suite 100
Albuquerque, New Mexico 87106

RE: DRAINAGE REPORT FOR SOILS AMENDMENT FACILITY PHASE III B-3, CONTRACT 5 (E-4) ENGINEER'S STAMP DATED NOVEMBER 9, 1989

Dear Ms. McDowell:

Based on the information on your submittal of November 9, 1989, the referenced plan is approved for Building Permit.

My only recommendation is the proposed 24" storm drain be extended west, past the proposed maintenance road. This extension could ease maintenance required because of possible erosion to the leech drain field and maintenance road.

If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially Yours,

Gilbert Aldaz, P.E. & L.S.
Civil Engineer/Hydrology

GA/bsj
(WP+383)

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SOILS AMENDMENT FACILITY ZONE ATLAS/ E,F-4,5,6

DRNG. FILE #

LEGAL DESCRIPTION: SOILS AMENDMENT FACILITY, TRACT I

CITY ADDRESS: 7400 ACCESS ROAD, NW, ALBUQUERQUE, NM 87120

ENGINEERING FIRM: MOLZEN-CORBIN & ASSOC. CONTACT: JACKIE MCDOWELL

ADDRESS: 2701 MILES RD. SE, 87106 PHONE: 242-5700

OWNER: CITY OF ALBUQUERQUE, NM CONTACT: GENE LEYENDECKER

ADDRESS: P.O. BOX 1293, 87103 PHONE: 873-6240

ARCHITECT: N/A CONTACT:

ADDRESS: PHONE:

SURVEYOR: N/A CONTACT:

ADDRESS: PHONE:

CONTRACTOR: N/A CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

_X_ YES
___ NO
___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 90-225
EPC NO. Z-90-43
PROJ. NO.

TYPE OF SUBMITTAL:

_X_ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAIN. PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ SITE DEVELOP. PLAN APPROV.
___ FINAL PLAT APPROVAL
___ BUILDING PERMIT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ CERTIF. OF OCCUP. APPROV.
___ ROUGH GRADE. PERMIT APPROV.
___ GRAD./PAVING PERMIT APPROV
_X_ OTHER FEMA MAP AMENDMENT (SPECIFY)

RECEIVED
AUG 1 1990
HYDROLOGY DIVISION

DATE SUBMITTED: AUGUST 1, 1990

BY: JACKIE MCDOWELL

Federal Emergency Management Agency

Washington, D.C. 20472

FEB 7 1991

Mr. Gilbert Aldaz, P.E., L.S.
Floodplain Administrator for the
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Community: City of Albuquerque,
Bernalillo County,
New Mexico
Community No.: 350002

Dear Mr. Aldaz:

This is in follow-up to our letter of December 19, 1990 (copy enclosed), in which we informed you that we were in the process of reviewing the report entitled Draft Revision of Section 22.2, Development Process Manual, dated September 1990. This report included the September 1990 version of the HYMO hydrologic model (AHYMO 990) and was accompanied by several supporting technical documents, the last of which was received on December 26, 1990. At this time, we wish to provide the City of Albuquerque with our comments resulting from this review, provide guidance on future Flood Insurance Rate Map (FIRM) revision request submittals, and clarify the data requirements associated with the FIRM revision requests submitted to date.

Review of the Development Process Manual

With regard to the September 1990 report, we are in general agreement with the methods of hydrologic analyses presented therein, as they apply specifically to the City of Albuquerque and surrounding areas. We wish to provide further comments on the three issues addressed below, storm duration, infiltration, and storm distribution. With the exception of the issue of storm distribution, FEMA will accept the methods of hydrologic analysis discussed in the city's Development Process Manual for use in the preparation of the technical data submitted in support of a FIRM revision request.

o Storm Duration

The city's Development Process Manual recommends that a 6-hour duration storm be used for projects without detention facilities. It furthermore states that for facilities which hold water for longer than 6 hours, longer duration storms are to be considered to establish runoff values. Our general criteria for assessing a proper storm duration will be dependent on a review of the following three factors: the primary consideration of the analysis, watershed characteristics, and the size of the watershed.

- The Primary Consideration (Volume of Runoff vs. Peak Flow)

Our October 29, 1990 letter to you contained the following general statement regarding storm duration:

"FEMA's position regarding the duration of rainfall is that the storm must extend for a period long enough to include all rainfall excess when the volume of the runoff hydrograph is an important consideration. This includes conditions when detention storage is involved, when sediment processes are a significant factor, and when combining and routing subbasin hydrographs to obtain watershed runoff. When the peak flow is the primary concern, and it is established that the use of a longer duration storm would not increase the peak flow, shorter duration storms are acceptable."

The requestor must accept responsibility for providing documentation to FEMA sufficient to demonstrate that all rainfall excess has been included when volume of runoff is the primary consideration.

- Watershed Characteristics (Pervious vs. Impervious)

  An impervious watershed is likely to have additional rainfall excess from longer duration storms. Therefore, when the primary consideration is the volume of runoff, the hydrologic analysis should reflect longer storm durations than would be appropriate for a pervious watershed or for a situation where volume of runoff is not the primary consideration.

- Size of Watershed

  The generally accepted criterion is that the storm duration for a watershed should be at least as long as the time required for flow to travel from the outer limit of the watershed to the point of interest. The city's Development Process Manual accurately points out that, given volumetric considerations and a very large watershed, it is possible that a storm duration greater than 24 hours would be appropriate.

When a hydrologic methodology involving a Soil Conservation Service (SCS) curve number is used, it should be noted that the SCS National Engineering Handbook and other SCS publications, such as the TR-55 and TR-20 hydrologic procedures manuals, stress the need to use 24-hour storm durations when applying SCS procedures. Other curve numbers can be derived from shorter duration storms or assigned to reproduce results from other infiltration procedures. However, the use of these alternative curve numbers with SCS procedures is inappropriate. In addition, the application of any such alternative curve numbers in a non-SCS methodology must be fully documented.

o Infiltration

FEMA recognizes and commends the considerable effort expended by various organizations to derive the initial abstraction/uniform infiltration (IA/INF) values discussed in the city's Development Process Manual and employed by the AHYMO 990 model. We also realize that the Development Process Manual and the IA/INF values are still undergoing development. We ask that any new information or research that alters the infiltration values be forwarded to us along with an updated Development Process Manual and AHYMO model.

Our review of the infiltration information submitted to date has revealed the following concerns:

- There appears to be some disparity in infiltration parameter values provided by the various organizations, as reflected in the submitted technical documents. The values utilized by the AHYMO 990 model cannot be readily attributed to the results of any one of these documents.

- The IA/INF method appears to significantly underestimate the runoff values when compared to an analysis of an observed storm of 7-hour duration, the results of which are presented in a paper entitled A Comparison of I.A./INF. and S.C.S. CN Methods Using HYMO, prepared by Mr. Clifford E. Anderson.

While FEMA will accept the infiltration values and methodology presented in the city's Development Process Manual, we ask that the city investigate these concerns and provide a discussion of their resolution along with any further revised version of the manual.

o Storm Distribution

The city's Development Process Manual recommends that 6- and 24-hour rainfall distributions be peaked at 30 minutes from the beginning of the storm. This is reflected in the options for analysis presented in the AHYMO 990 hydrologic model. We have determined that, for both 6- and 24-hour storm durations, this early bulking of the hyetograph in the AHYMO 990 model causes a significant reduction in peak flows and runoff volumes when compared with the HEC-1 model, which places the highest rainfall concentration in the middle of the hyetograph. These differences are more pronounced, and thus a concern, when pervious watersheds are involved; the differences are negligible for impervious watersheds.

FEMA recognizes that there are meteorological factors specific to the City of Albuquerque and surrounding areas that may make the rainfall distribution utilized by the HEC-1 model inappropriate. Discussions with the National Weather Service indicate that in the City of Albuquerque the most intense rainfall is more likely to occur closer to the beginning of the storm than in the middle of

the storm. This meteorological factor is further noted in a Soil Conservation Service (SCS) manual entitled Peak Rates of Discharge for Small Watersheds, Chapter 2 for New Mexico. The SCS, for hydrologic analyses within the City of Albuquerque, has placed the maximum 1-hour rainfall in the 6th hour of a 24-hour storm.

While we recognize that the most intense rainfall can occur early in storms in the vicinity of Albuquerque, we believe that placing the maximum 1-hour rainfall in the first hour of the 6- and 24-hour storms may unduly reflect the effects of initial infiltration. We suggest that the city consider adopting an alternative arrangement of hourly rainfall. A reasonable compromise to the descending arrangement of hourly rainfall presented in AHYMO 990 is presented below.

	Hourly Rainfall (in.)	
	AHYMO 990[1]	Preferred Arrangement[2]
1st Hour	1.8700	0.0758
2nd Hour	0.1129	1.8700
3rd Hour	0.0758	0.1129
4th Hour	0.0571	0.0571
5th Hour	0.0459	0.0459
6th Hour	0.0383	0.0383

[1]These values are taken from Rainfall Type=1 in the AHYMO 990 model

[2]Can be used in Rainfall Type=1 and 2

Our preferred arrangement moves the 1-hour maximum rainfall to the second hour and puts the value of the hourly rainfall that is closest to the average value of the other five hourly increments in the first hour. This arrangement, using hourly values from AHYMO 990, produces results that are about midway between those obtained by HEC-1 and AHYMO 990. With this compromise, FEMA would have greater assurance that revision requests based on a AHYMO 990 analysis would contain reasonable estimates of the base (100-year) flood.

General Guidance On Future Submittals

In addition to the comments regarding your community's Development Process Manual and the AHYMO 990 hydrologic model, we would like to provide general guidance regarding the quality and format of material submitted in support of a revision request for the City of Albuquerque. FEMA's ability to review and provide a timely response to revision requests is directly related to the completeness and quality of the technical data and supporting documentation associated with the request. FEMA has established and provided to the city review criteria regarding revision requests; the city should perform a cursory evaluation of each request with respect to these criteria prior to forwarding it to FEMA.

This evaluation should ensure that the requestor has provided a suitable write-up to explain a proposed or existing development and the methodologies used to analyze its impact on flood hazards in the area. In addition, any evaluation by the city should take into account that the technical issues of particular concern for the evaluation of flood hazards in the region include proper hydrologic methodologies, alluvial fan flooding, and the impact of sedimentation. When transmitting a request to FEMA, the city would greatly assist our review by providing a discussion of its viewpoint on the impact of sedimentation and/or the existence of known inactive or active alluvial fans in the project area, as well as a determination regarding the request's proper application of the Development Process Manual and AHYMO model. Again, any contribution made by the city in this regard will greatly assist, and most assuredly expedite, FEMA's processing of a revision request.

Data Requirements

The data requirements specified for each revision request in our May 11, 1990 letter were derived from the criteria outlined in our March 8, 1990 letter. The data requirements related to the issue of hydrology have been reevaluated based on our review of the city's Development Process Manual. Please refer to Appendix A of this letter for an indication of the additional data required to continue processing of the revision requests referenced in our May 11, 1990 letter, as well as those received since that date. This is with the exception of the most recent submittal reflecting the proposed Cerro Colorado Landfill, which will be addressed in a subsequent letter, in approximately two weeks.

The required items indicated in Appendix A, including the necessary initial fees, should be submitted to the following address:

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
500 C Street, S.W., Room 422
Washington, DC 20472

Attention: Charles A. Lindsay

The case numbers referenced in Appendix A should be included on any check or money order for identification purposes and sent by Registered Mail, Return Receipt Requested. Our processing of these requests has been suspended pending receipt of the requested additional data and, if applicable, the necessary initial fees.

This further review and discussion of hydrologic issues within the City of Albuquerque is designed to better provide the city with FEMA's hydrologic review criteria. We wish to reiterate that FEMA's requirements for flood insurance mapping purposes do not dictate community storm drain or flood control facility design standards, unless the community so desires. These requirements are necessary because most requests for revisions involve a reduction in the area covered by the base flood.

Please note that FEMA's viewpoint on the issues of the Rational Runoff Formula, Sedimentation, and Alluvial Fan Flooding Analysis, as presented in our March 8 and October 29, 1990 letters (copies enclosed) still apply. Also note that FEMA's review and discussion of the city's Development Process Manual and the AHYMO 990 model does not preclude the use of other methods of hydrologic analysis previously accepted for use by FEMA and other Federal agencies.

We sincerely appreciate the assistance the City of Albuquerque has shown in providing the information necessary to resolve our concerns and we trust that this letter further defines FEMA's position regarding information required to revise the City of Albuquerque's FIS. However, if you have any further questions pertaining to the above material, please call Matthew B. Miller at (202) 646-3461.

Sincerely,

William R. Locke

William R. Locke
Acting Chief, Risk Studies Division
Federal Insurance Administration

Enclosures

cc: The Honorable Louis Saavedra, Mayor of the City of Albuquerque
Mr. Robert E. Gurule, Director of the Department of Public Works for the City of Albuquerque
Mr. Alex Abeyta, Jr., County Manager for Bernalillo County
Mr. Martin Garcia, Special Assessments Engineer, Bernalillo County
Mr. Clifford E. Anderson, P.E., L.S., Albuquerque Metropolitan Arroyo Flood Control Authority
Mr. Dwight Andrews, Investment Asset Management, Inc.
Mr. Jake Bordenave, P.E., Bordenave Designs
Mr. David L. Smith, Easterling & Associates, Inc.
Mr. Dennis A. Lorenz, Espey, Huston & Associates, Inc.
Mr. Kerry L. Davis, P.E./Ms. Sandi Orton, Bohannan-Huston, Inc.
Ms. Laura Milne, Bohannan-Huston, Inc.
Mr. John A. Andrews, P.E., Andrew, Asbury & Robert, Inc.
Mr. Donald Dixon, P.E., Holmes & Narver
Mr. Steven J. Metro, P.E., Wilson & Company

Request: Soil Amendment Facility - Pilot Compositing Facility

Requestor: Mr. Gilbert Aldaz, P.E., L.S.
Floodplain Administrator for the City of Albuquerque

The following additional data are required so that we can continue the review of this request:

- Hydrologic analyses of the contributing drainage area in accordance with the criteria set forth in this letter. The hydrologic analyses submitted in support of this request is based on the AHYMO 490 hydrologic model. If the more up-to-date version of this model, AHYMO 990, discussed in this letter is more appropriate, we ask that it be used as part of a hydrologic analyses.

- Technical analyses supporting the removal of the flood hazard information along the two unnamed tributaries to Playa Lake.

- Analyses of the effects of sediment on Playa Lake that must address, but are not limited to, the criteria set forth in our March 8, 1990 letter. The submitted sediment analyses determines the volume of sediment over a 50-year period. For floodplain management, the volume of sediment generated during a 100-year flood must be determined.

- Determination of maintenance procedures for Playa Lake, as specified in Subparagraph 65.6(a)(12) of the NFIP regulations. This documentation must include a description of the nature of the maintenance activities to be performed, the frequency with which they will be performed, and the title of the local community official who will be responsible for assuring that the maintenance activities are accomplished.

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 13, 1990

Diane Leatherwood
Emergency Management Specialist
Region VI, Federal Center
800 North Loop 288
Denton, Texas 76201-3698

RE: REQUEST FOR LETTER OF MAP REVISION FOR SOILS AMENDMENT FACILITY (SAF)-PILOT COMPOSTING FACILITY, (E4)

Dear Ms. Leatherwood:

The purpose of this letter is to request a Letter of Map Revision for the referenced site. The reason the request is being made is because better topographic mapping was done as part of this project. The results demonstrated that this data is more accurate than the data used in the original FEMA analysis. As shown on the attached FIRM panel 350001-0100C, Exhibit 1, the new 100-year floodplain area is much smaller than the original study. We have also attached a drainage report to substantiate our conclusions.

Your review to this request at your earliest convenience would greatly be appreciated.

Cordially,

Gilbert Aldaz, P.E. & L.S.
City/County Floodplain Administrator

xc: Clifford E. Anderson, AMAFCA
Jackie S. McDowell, P.E.
2701 Miles Road, SE 87106

GA
wp+1596

Federal Emergency Management Agency

Region VI, Federal Center, 800 North Loop 288
Denton, Texas 76201-3698

NTH

August 28, 1990

Mr. Gilbert Aldaz, P.E. & L.S.
City/County Floodplain Administrator
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Request for Letter of Map Revision;
Soils Amendment Facility;
City of Albuquerque, New Mexico

Dear Mr. Aldaz:

Your submission of the referenced request was received by this office on August 20, 1990. After cursory review by this office, the request was forwarded to our Technical Evaluation Consultant (TEC), via FEMA National Office, for detailed review. You will be notified of their comments, recommendations, and determinations upon completion of that review.

Should there be questions in the interim, feel free to contact me at (817) 898-9284.

Sincerely,

Kenneth W. Davis, P.E., L.S.
Civil Engineer
Natural and Technological
Hazards Division

cc: Mr. Matt Miller, FEMA National Office

To:
Subject: SAF flood plain status

Distribution:

None, this item is In Progress

To: Gilbert Aldaz From: Steve Glass
Subject: SAF flood plain status Date Sent: 08/08/91

Gilbert -

Some time ago, Jackie McDowell with Molzen-Corbin conducted an evaluation of the 100-year flood plain elevation for the playa within the boundaries of the Soils Amendment Facility on the West Mesa. Current FEMA maps show the 100-year flood plain encompassing a majority of the Facility acreage, including existing structures, and we had intended to submit a change request based on Ms. McDowell's analysis. Can you provide an update on the status of the change request? Thanks.

cc: Terry Tobel
Gene Leyendecker
Mike Pink

---------- Reply ----------

I sent a memo to Gene Leyendecker on March 21, 1991 with FEMA's comments prior to them approving a Letter of Map Revision. I have not heard anything to date. If you would like another copy please call me at ext 2666, thanks for following up on this issue. We should go forward on this so it will not be a problem in the future.

100 year STORM VOLUME

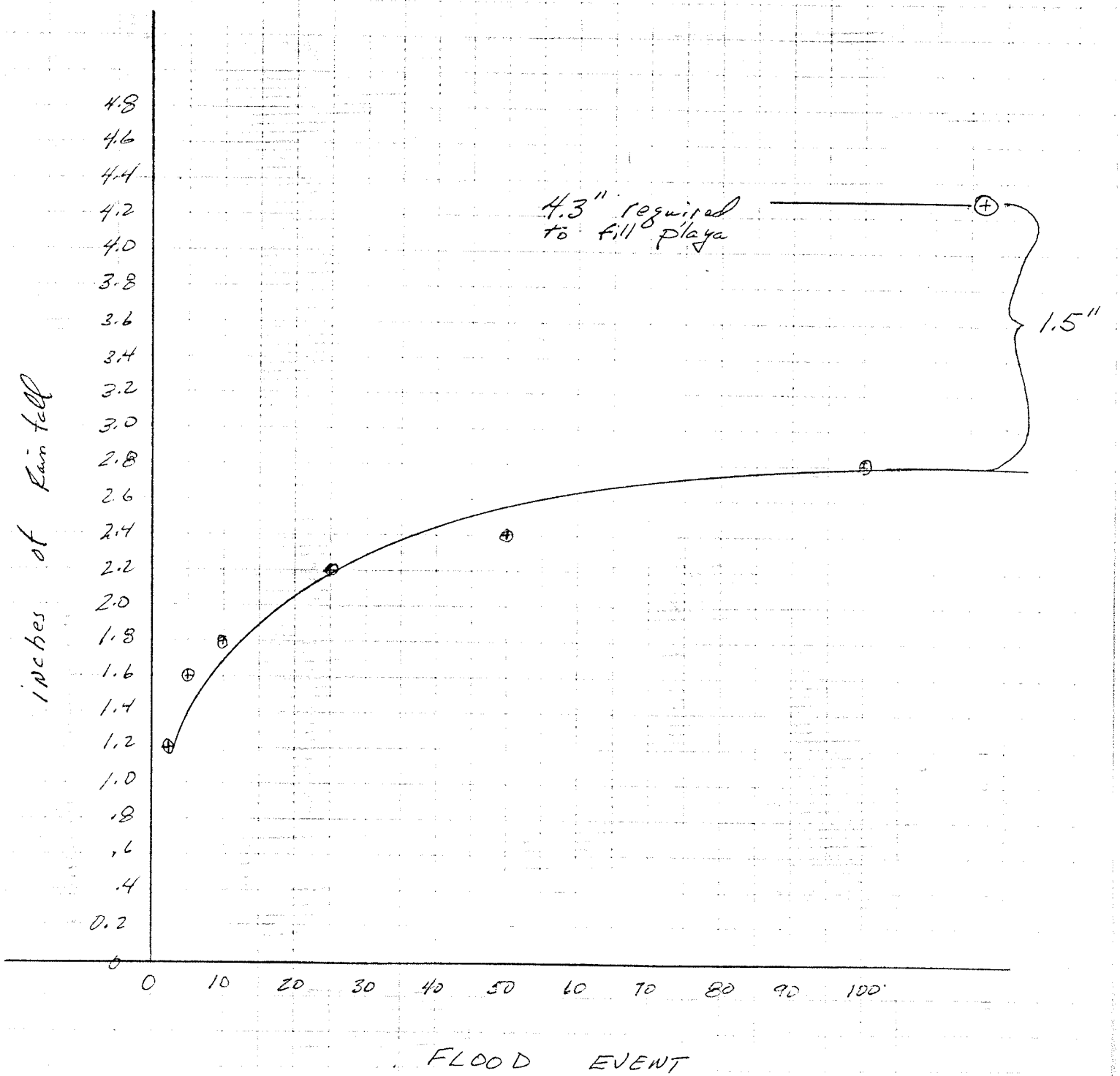
using Attached Peak Rate of Discharge CH 2
using 2.8 inches from NOAA Atlas 2461.
STORM CN = 76

2.8 inches ⇒ 0.9 inches Direct Runoff

$$\frac{0.9 \text{ inches}}{1} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{3440 \text{ AC}}{1} = 258.0 \text{ AC-FT}$$

100 year storm has a volume of runoff equal to 258.0 AC-FT

Contour	Vol AC-FT	Cumulative AC-FT	
5854	2.57	2.57	
56	24.2	26.8	
58	91.0	117.8	← 258.0 AC-FT
5860	177.7	295.5	


4.8
4.6
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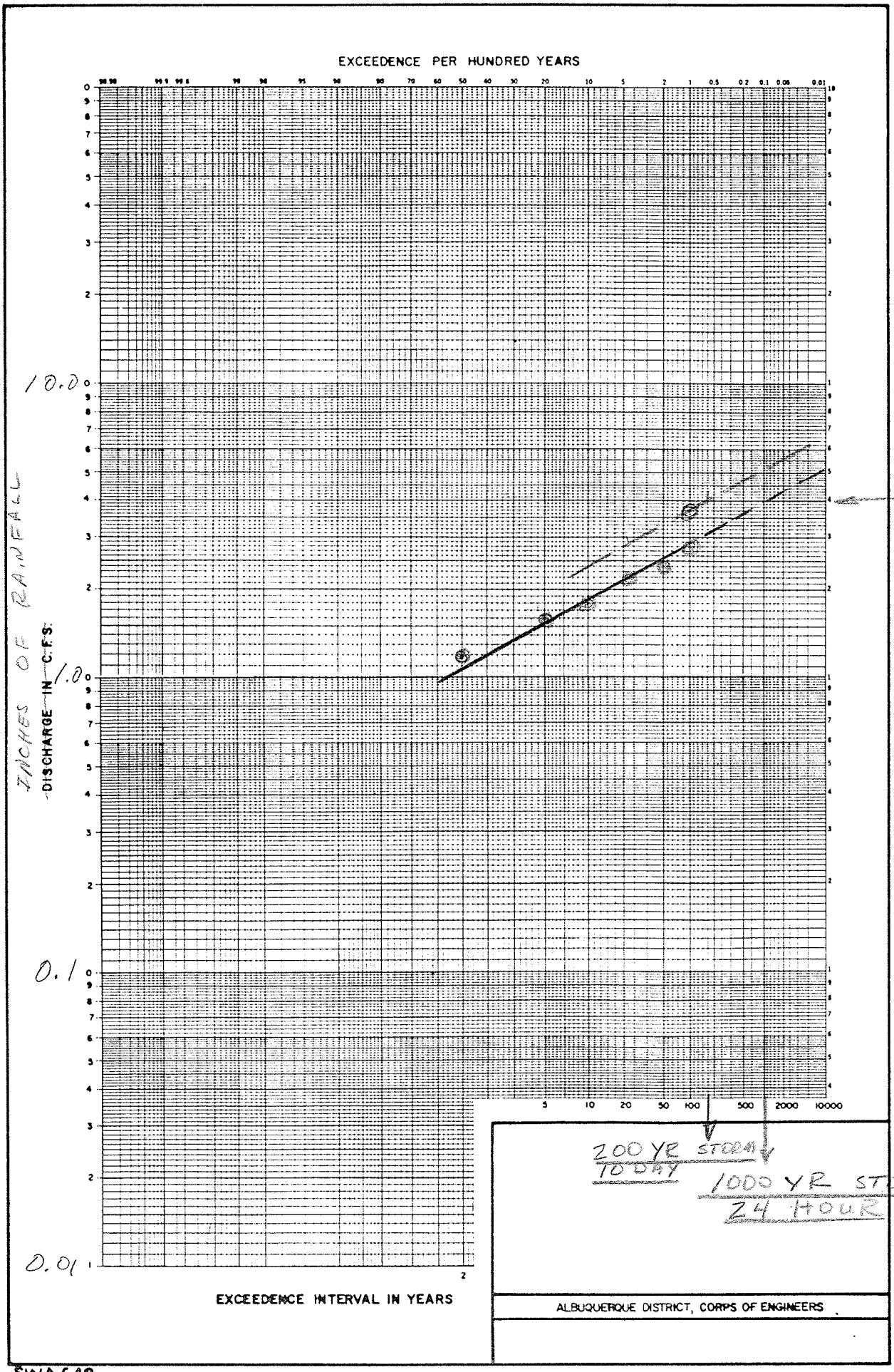
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0.2
0
inches of rainfall
4.3" required to fill playa
1.5"
0
10
20
30
40
50
60
70
80
90
100
FLOOD EVENT



SWA 648
MAR 78

1528

9078027

GRANT OF EASEMENT
for
FLOOD PLAIN

The City of Albuquerque, New Mexico, a municipal corporation, Grantors, for good and valuable consideration, the receipt of which is hereby acknowledged, does grant, bargain, sell and convey unto the ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA), a political subdivision of the State of New Mexico, and its successors and assigns, the permanent right and easement to convey storm water and to construct, reconstruct, operate and maintain storm drainage improvements on, in, under, over, and across the following described real estate.

The land in which the foregoing rights and easements are granted is located in the City of Albuquerque, County of Bernalillo and State of New Mexico and is more particularly described in Exhibit "A" attached hereto and incorporated herein by reference.

Except by written approval from AMAFCA, no obstruction may be placed or maintained in said easement and there shall be no alteration of grades or contours in said easement area. The granting of this easement shall not obligate AMAFCA to maintain natural arroyos, drainage channels, or facilities that do not meet the standards of AMAFCA for design and construction, nor shall this granting require the protection of property lying outside of the easement hereby granted.

TO HAVE AND TO HOLD the said right and easement for the uses and purposes aforesaid, unto the AMAFCA, its successors and assigns, forever, except that any portion of the easement granted herein shall revert to the Grantor, its successors or assigns, as and to the extent said portion is declared unnecessary for flood control or drainage by the Board of Directors of the Albuquerque Metropolitan Arroyo Flood Control Authority. Any reversion shall be conveyed by quitclaim deed.

THERE IS RESERVED to the Grantor, its successors and assigns, the right to use said lands for open space landscaping and other purposes which will not interfere with the rights and easements hereby granted, provided that Grantor obtains AMAFCA's written approval for such use, not to be unreasonably withheld.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

90 SEP 28 PM 3:26

BK 90-16 PG 1528-1533
GLADYS M. DAVIS
CO CLERK & RECORDER
DEPUTY

GRANTOR:

WITNESS its hand and seal this 7th day of September, 1990.

Arthur A. Blumenfeld
Chief Administrative Officer
City of Albuquerque
A Municipal Corporation

ACKNOWLEDGEMENT

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 1th day of September, 1990, by Arthur a . Blumenfeld, Chief Administrative Officer, City of Albuquerque, a municipal corporation, on behalf of said municipal corporation.

My Commission Expires:

4-2-94

Notary Public

GRANTEE:

Albuquerque Metropolitan Arroyo Flood Control Authority

Approved:

By:

Title: Executive Engineer

Date: 26 September 1990

EXHIBIT "A"

FLOOD PLAIN EASEMENT DESCRIPTION
(LOCATION TAKEN FROM CONTOURS ESTABLISHED FOR THE "FAR NORTHWEST DRAINAGE MANAGEMENT PLAN")

A PARCEL OF LAND SITUATE IN SECTIONS 22, 27, AND 34, TOWNSHIP 11 NORTH, RANGE 1 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, COUNTY OF BERNALILLO, STATE OF NEW MEXICO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID EASEMENT FROM WHENCE THE NORTHWEST CORNER OF TRACT I, SOILS AMENDMENT FACILITY BEARS N 89 DEGREES 56' 15" W, A DISTANCE OF 1260.21 FEET:

THENCE, S 89 DEGREES 56' 15" E, A DISTANCE OF 263.95 FEET, ALONG THE NORTHERLY BOUNDARY OF SAID TRACT A, TO A POINT,

THENCE, S 13 DEGREES 57' 08" E, A DISTANCE OF 302.95 FEET TO A POINT,

THENCE, S 09 DEGREES 53' 45" E, A DISTANCE OF 364.74 FEET TO A POINT,

THENCE, S 13 DEGREES 25' 32" E, A DISTANCE OF 316.80 FEET TO A POINT,

THENCE, S 01 DEGREES 04' 34" E, A DISTANCE OF 501.09 FEET TO A POINT,

THENCE, S 06 DEGREES 50' 32" W, A DISTANCE OF 357.83 FEET TO A POINT,

THENCE, S 00 DEGREES 04' 18" E, A DISTANCE OF 465.56 FEET TO A POINT,

THENCE, S 09 DEGREES 01' 01" E, A DISTANCE OF 468.46 FEET TO A POINT,

THENCE, S 05 DEGREES 13' 45" E, A DISTANCE OF 363.75 FEET TO A POINT,

THENCE, S 06 DEGREES 11' 18" W, A DISTANCE OF 340.54 FEET TO A POINT,

THENCE, S 02 DEGREES 29' 47" W, A DISTANCE OF 345.79 FEET TO A POINT,

THENCE, S 07 DEGREES 01' 07" E, A DISTANCE OF 367.96 FEET TO A POINT,

THENCE, S 29 DEGREES 10' 25" E, A DISTANCE OF 455.63 FEET TO A POINT,

THENCE, S 31 DEGREES 52' 17" E, A DISTANCE OF 424.42 FEET TO A POINT,

THENCE, S 16 DEGREES 23' 27" E, A DISTANCE OF 313.00 FEET TO A POINT,

THENCE, S 08 DEGREES 39' 51" E, A DISTANCE OF 396.31 FEET TO A POINT,

THENCE, S 08 DEGREES 14' 14" W, A DISTANCE OF 138.22 FEET TO A POINT,

THENCE, S 33 DEGREES 32' 46" E, A DISTANCE OF 165.43 FEET TO A POINT,

THENCE, S 06 DEGREES 40' 24" W, A DISTANCE OF 153.59 FEET TO A POINT,

THENCE, S 01 DEGREES 40' 50" E, A DISTANCE OF 293.45 FEET TO A POINT,

THENCE, S 04 DEGREES 52' 58" E, A DISTANCE OF 194.62 FEET TO A POINT,

THENCE, S 15 DEGREES 47' 29" W, A DISTANCE OF 152.37 FEET TO A POINT,

THENCE, S 55 DEGREES 17' 40" E, A DISTANCE OF 275.21 FEET TO A POINT,

THENCE, N 82 DEGREES 27' 46" E, A DISTANCE OF 146.12 FEET TO A POINT,

THENCE, S 46 DEGREES 30' 17" W, A DISTANCE OF 1155.42 FEET TO A POINT,

THENCE, N 39 DEGREES 48' 26" W, A DISTANCE OF 14.25 FEET TO A POINT,

THENCE, N 27 DEGREES 18' 23" W, A DISTANCE OF 287.02 FEET TO A POINT,

THENCE, N 02 DEGREES 01' 28" E, A DISTANCE OF 57.12 FEET TO A POINT,

THENCE, N 16 DEGREES 32' 17" E, A DISTANCE OF 128.31 FEET TO A POINT,

THENCE, N 12 DEGREES 50' 40" W, A DISTANCE OF 83.81 FEET TO A POINT,

THENCE, N 35 DEGREES 08' 26" W, A DISTANCE OF 490.18 FEET TO A POINT,

THENCE, N 30 DEGREES 17' 47" W, A DISTANCE OF 453.93 FEET TO A POINT,

THENCE, N 21 DEGREES 24' 35" W, A DISTANCE OF 489.66 FEET TO A POINT,

THENCE, N 31 DEGREES 29' 07" W, A DISTANCE OF 254.06 FEET TO A POINT,

THENCE, N 06 DEGREES 52' 18" W, A DISTANCE OF 171.53 FEET TO A POINT,

THENCE, N 16 DEGREES 17' 36" E, A DISTANCE OF 415.20 FEET TO A POINT,

THENCE, N 06 DEGREES 46' 50" E, A DISTANCE OF 461.85 FEET TO A POINT,

THENCE, N 01 DEGREES 08' 02" E, A DISTANCE OF 312.07 FEET TO A POINT,

THENCE, N 25 DEGREES 03' 55" W, A DISTANCE OF 104.36 FEET TO A POINT,

THENCE, N 28 DEGREES 53' 47" W, A DISTANCE OF 201.33 FEET TO A POINT,

THENCE, N 07 DEGREES 09' 33" W, A DISTANCE OF 251.00 FEET TO A POINT,

THENCE, N 47 DEGREES 49' 11" E, A DISTANCE OF 86.40 FEET TO A POINT,

THENCE, N 00 DEGREES 46' 09" W, A DISTANCE OF 482.34 FEET TO A POINT,

THENCE, N 03 DEGREES 18' 33" W, A DISTANCE OF 420.02 FEET TO A POINT,

THENCE, N 08 DEGREES 14' 04" E, A DISTANCE OF 290.36 FEET TO A POINT,

THENCE, N 09 DEGREES 14' 59" E, A DISTANCE OF 141.59 FEET TO A POINT,

THENCE, N 21 DEGREES 14' 13" W, A DISTANCE OF 81.34 FEET TO A POINT,

THENCE, N 06 DEGREES 31' 40" E, A DISTANCE OF 270.43 FEET TO A POINT,

THENCE, N 28 DEGREES 22' 54" W, A DISTANCE OF 175.72 FEET TO A POINT,

THENCE, N 08 DEGREES 36' 40" W, A DISTANCE OF 150.34 FEET TO A POINT,

THENCE, N 45 DEGREES 44' 07" W, A DISTANCE OF 101.62 FEET TO A POINT,

THENCE, N 06 DEGREES 29' 14" W, A DISTANCE OF 95.11 FEET TO A POINT,

THENCE, N 24 DEGREES 30' 43" E, A DISTANCE OF 251.95 FEET TO A POINT,

THENCE, N 13 DEGREES 41' 10" E, A DISTANCE OF 342.33 FEET TO A POINT,

THENCE, N 11 DEGREES 22' 49" W, A DISTANCE OF 461.92 FEET TO A POINT,

THENCE, N 00 DEGREES 25' 41" W, A DISTANCE OF 118.12 FEET TO A POINT,

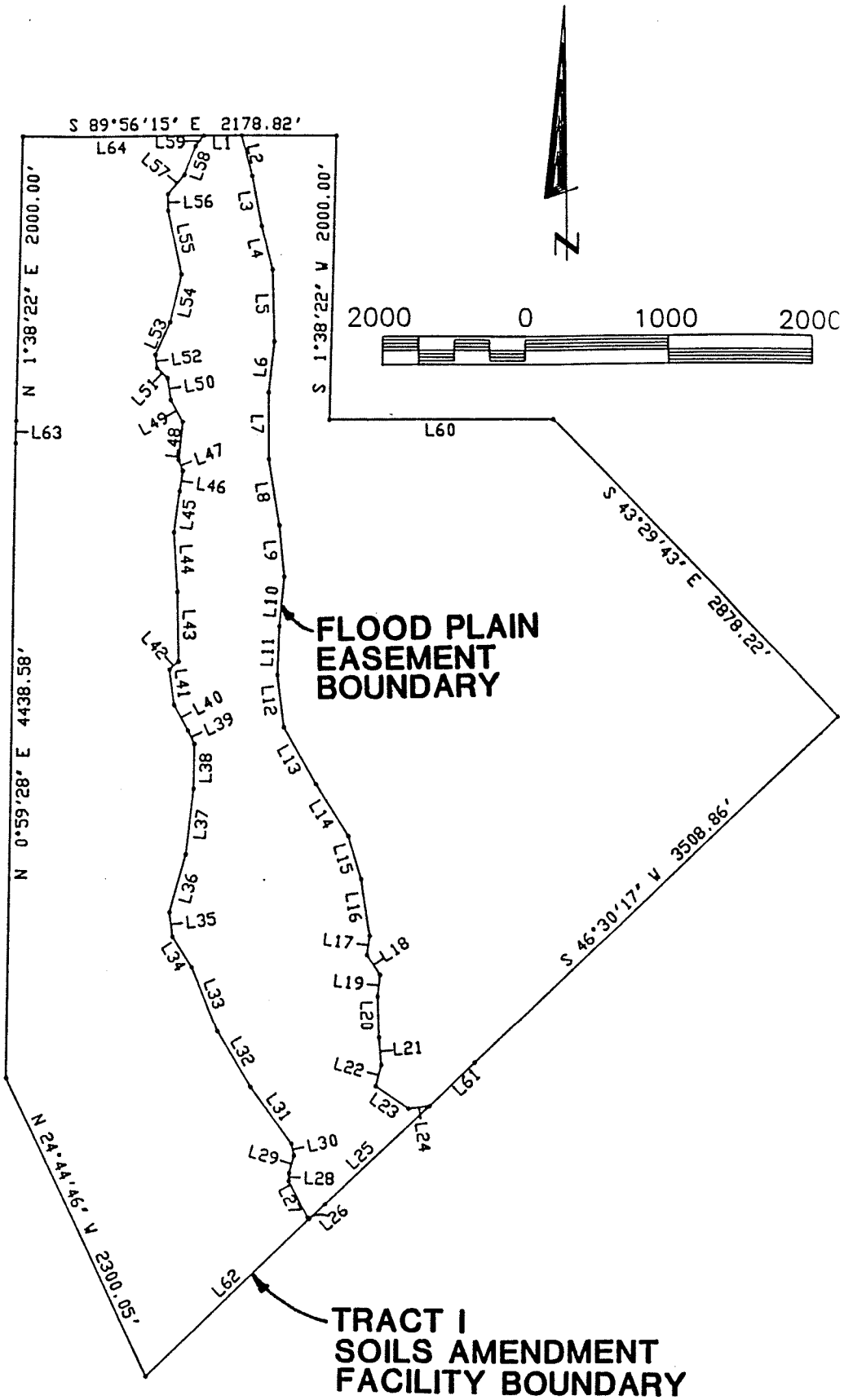
THENCE, N 40 DEGREES 10' 32" E, A DISTANCE OF 180.21 FEET TO A POINT,

THENCE, N 20 DEGREES 50' 48" E, A DISTANCE OF 219.00 FEET TO A POINT,

THENCE, N 37 DEGREES 40' 32" E, A DISTANCE OF 94.09 FEET TO THE POINT OF BEGINNING.

CONTAINING 139.8490 ACRES, MORE OR LESS.

LINE	BEARING	DISTANCE
L1	S 89°56'15" E	263.95
L2	S 13°57'08" E	302.95
L3	S 9°53'45" E	364.74
L4	S 13°25'32" E	316.80
L5	S 1°04'34" E	501.09
L6	S 6°50'32" W	357.83
L7	S 0°04'18" E	465.56
L8	S 9°01'01" E	468.46
L9	S 5°13'45" E	363.75
L10	S 6°11'18" W	340.54
L11	S 2°29'47" W	345.79
L12	S 7°01'07" E	367.96
L13	S 29°10'25" E	455.63
L14	S 31°52'17" E	424.42
L15	S 16°23'27" E	313.00
L16	S 8°39'51" E	396.31
L17	S 8°14'14" W	138.22
L18	S 33°32'46" E	165.43
L19	S 6°40'24" W	153.59
L20	S 1°40'50" E	293.45
L21	S 4°52'58" E	194.62
L22	S 15°47'29" W	152.37
L23	S 55°17'40" E	275.21
L24	N 82°27'46" E	146.12
L25	S 46°30'17" W	1155.42
L26	N 39°48'26" W	14.25
L27	N 27°18'23" W	287.02
L28	N 2°01'28" E	57.12
L29	N 16°32'17" E	128.31
L30	N 12°50'40" W	83.81
L31	N 35°08'26" W	490.18
L32	N 30°17'47" W	453.93
L33	N 21°24'35" W	489.66
L34	N 31°29'07" W	254.06
L35	N 6°52'18" W	171.53
L36	N 16°17'36" E	415.20
L37	N 6°46'50" E	461.85
L38	N 1°08'02" E	312.07
L39	N 25°03'55" W	104.36
L40	N 28°53'47" W	201.33
L41	N 7°09'33" W	251.00
L42	N 47°49'11" E	86.40
L43	N 0°46'09" W	482.34
L44	N 3°18'33" W	420.02
L45	N 8°14'04" E	290.36
L46	N 9°14'59" E	141.59
L47	N 21°14'13" W	81.34
L48	N 6°31'40" E	270.43
L49	N 28°22'54" W	175.72
L50	N 8°36'40" W	150.34
L51	N 45°44'07" W	101.62
L52	N 6°29'14" W	95.11
L53	N 24°30'43" E	251.95
L54	N 13°41'10" E	342.33
L55	N 11°22'49" W	461.92
L56	N 0°25'41" W	118.12
L57	N 40°10'32" E	180.21
L58	N 20°50'48" E	219.00
L59	N 37°40'32" E	94.09
L60	S 89°56'15" E	1564.12
L61	S 46°30'17" W	1441.97
L62	S 46°30'17" W	1724.62
L63	N 1°38'22" E	160.01
L64	S 89°56'15" E	1260.21



CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

ENGINEERING GROUP

INTER-OFFICE CORRESPONDENCE April 5, 1990

TO: William Leyendecker, Chief Environmental Engineer - PWD

FROM: Carlos Montoya, Project Manager, Hydrology Division - PWD CAM

SUBJECT: STORM DETERMINATION FOR SAF

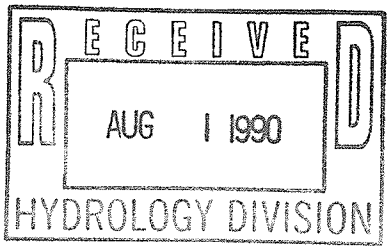
I have estimated the storm event which would overtop the playa per your request. The playa would contain 571 ac. ft. of storm water before it would overtop. Therefore we would need a rainfall event larger then 4.0 inches falling over the drainage basin of 5.37 sq. mi. for a period of 24 hours. The 100 year event is 2.8 inches for a 24 hour period. We would almost have to double the 100 year even to produce the rainfall required to overtop the playa. By using log-log paper I have plotted the 2 year through the 100 year rainfall and have projected the line to 4.0 inches. I estimate that 4.0 inches of rainfall in a 24 hour duration is a 1000 year storm.

CM:jc
WP+1775

CITY OF ALBUQUERQUE
NEW MEXICO

SOILS AMENDMENT FACILITY
FEMA MAP AMENDMENT

July 1990



City Copy

MOLZEN-CORBIN & Associates

TABLE OF CONTENTS

I. INTRODUCTION

Molzen-Corbin & Associates has been authorized by the City of Albuquerque to prepare calculations to submit to the Federal Emergency Management Agency (FEMA) in order to revise the flood designation shown on their Flood Insurance Rate Map, Community Panel Number 350001 0100C, dated September 15, 1983 (see Exhibit I). This is necessary due to the incorrect flood designation due to limited topography at the time of the study, and the recent annexation of this property into the City of Albuquerque with the different criteria prescribed by the City on the frequency of storm to be used in the flood analysis of an area that is retaining storm water for over six hours. This criteria is outlined in the City of Albuquerque Drainage Ordinance. As stated in the ordinance, basins with longer than 6-hour evacuation times shall use a 24-hour storm volume, as defined by the National Oceanic Atmospheric Administration (NOAA).

II. SITE CONDITIONS

The Soils Amendment Facility (SAF) - Pilot Composting Facility is an existing City-owned-and-operated site for wastewater sludge management. The site is located in Section 27, Township 11 North, Range 1 East, New Mexico Principal Meridian, in the City of Albuquerque, state of New Mexico (see Exhibit II). Existing development of the site includes an administration building, a vehicle garage, a 600,000-gallon ground water storage reservoir, a booster pump building, a well, truck scale, and associated roads, parking, and landscaping. This development was constructed in 1988-1989. Future (1990-1991) development of the site includes a metal frame structure approximately 350 feet by 600 feet in plan dimension with associated roads and landscaping. Ultimate development of the site will include two additional identical metal frame structures that match the one to be constructed this year (see Exhibit III). One-fourth of the ultimate development area slopes to the west to the "Playa Lake", and three-fourths of the site slopes to the east to recently constructed retention ponds with a volume of 9.20 ac-ft. These recently constructed

ponds were designed to retain 100 percent of the rainfall volume produced by a 100-year storm.

III. DRAINAGE DESIGN CRITERIA

The drainage design criteria used for the analysis is the "Draft Revision of Section 22.2, City of Albuquerque, Development Process Manual (DPM), Volume II, prepared by the DPM Drainage Design Criteria Committee dated January 1990. The modified computer program used was the April 1990 version of HYMO (AHYMO490) prepared by AMAFCA. A 100-year, 24-hour storm was used to calculated the basins' peak flow rate and volume into the Playa.

IV. RESULTS AND RECOMMENDATIONS

For computer program input and output see Appendix A, Calculations.

The volume of storage available in the Playa Lake is 515.3 acre-feet at an elevation of 5,862.0. The 100- year, 24-hour flood volume is 273.3 acre-feet with the flood elevation being at 5860.11 feet, MSL. The calculated 50-year sediment volume is 273.9 acre-feet, not including the consideration for wind erosion, and is therefore, conservative.

We recommend that the spillway elevation of 5,862.0 be staked in the field so that the existing land application operations do not encroach into the limits of the potential flood zone. We also recommend that the flood zone be updated (amended), as shown on Exhibit III and Exhibit IV.

MOLZEN-CORBIN & Associates
ENGINEERS/PLANNERS/CONSULTANTS
ALBUQUERQUE • NEW MEXICO • CARLSBAD

SAF FEMA MAP REVISION @ PLAYA LAKE

CLIENT C.O.A. PROJECT NO.
PROJECT M-583-33 X13
SUBJECT SAF FEMA Map Revision
CALCULATED BY [illegible] DATE 10-28-90
CHECKED BY DATE SHEET NO. OF

Reference: "Draft Revision of Section 22.2, DPM" by the Development Process Manual Drainage Design Criteria Committee

pg. 3 P_{360} (6-hour) = 2.20" for Zone 1 (west of the Rio Grande)

P_{1440} (24-hour) = 2.66" " " " " " "

Total Basin Area to the Playa Lake is 3472.5 acres.

$$3472.5\,ac \times \frac{43560\,ft^2}{ac} \times \left(\frac{mi}{5280\,ft}\right)^2 = 5.43\,mi^2$$

pg. 12 $t_c = \left(\frac{L}{V}\right) \div 60\,sec/min$

$L = 14{,}000$ feet

$V = K\sqrt{S}$

$S = 1.5858\%$

$K = 1.0$ (Bare Ground)

$\therefore\ t_c = 185.3$ min

$t_p = (2/3)t_c = 123.5$ min $= 2.0583$ hr.

Treatment: Percent Type A = 99.80%
" " B = 0.04%
" " C = 0.00%
" " D = 0.16%

HYMO INPUT SAF.DAT

```
START                    TIME=0.0
********COMPUTE HYDROGRAPHS FOR THE DECEMBER 1989 DPM REVISION
*
*SAF PLAYA LAKE BASIN 100-YEAR, 24-HOUR, PEAK FLOW RATE AND VOLUME
COMPUTE NM HYD       ID=1    HYD NO= 101      DA=5.43 SQ MI
                     PER A=99.80  PER B=0.04  PER C=0  PER D=0.16  TP=-2.0583
                     RAIN TWENTY FOUR=2.66
PRINT HYD            ID=1       CODE=1
FINISH
```

HYMO OUTPUT

OUT

```
      HYMO PROGRAM (AHYMO490) - AMAFCA VERSION  APR.,1990
                RUN DATE (MON/DAY/YR) = 06/28/1990
                START TIME (HR:MIN:SEC) = 10:27:30

START                    TIME=0.0

********COMPUTE HYDROGRAPHS FOR THE DECEMBER 1989 DPM REVISION

*

*SAF PLAYA LAKE BASIN 100-YEAR, 24-HOUR, PEAK FLOW RATE AND VOLUME

COMPUTE NM HYD       ID=1   HYD NO= 101      DA=5.43 SQ MI

                     PER A=99.80  PER B=0.04  PER C=0  PER D=0.16  TP=-2.058
3
                     RAIN TWENTY FOUR=2.66

                COMPUTED RAINFALL DISTRIBUTION WITH DT=0.033333 HOURS
                   .0000   .0014   .0061   .0180   .0417   .0821   .1444
                   .2337   .3556   .5158   .7201   .9744  1.2848  1.5527
                  1.6732  1.7753  1.8663  1.9492  2.0258  2.0970  2.1637
                  2.2263  2.2854  2.3412  2.3941  2.4442  2.4918  2.5370
                  2.5801  2.6210  2.6600  2.6190  2.5812  2.5442  2.5079
                  2.4723  2.4373  2.4030  2.3693  2.3362  2.3037  2.2717
                  2.2402  2.2093  2.1789  2.1489  2.1195  2.0905  2.0619
                  2.0337  2.0060  1.9787  1.9517  1.9252  1.8990  1.8731
                  1.8477  1.8225  1.7977  1.7732  1.7491  1.7252  1.7016
                  1.6784  1.6554  1.6327  1.6102  1.5881  1.5661  1.5445
                  1.5231  1.5019  1.4809  1.4602  1.4398  1.4195  1.3994
                  1.3796  1.3600  1.3406  1.3213  1.3023  1.2835  1.2648
                  1.2463  1.2280  1.2099  1.1920  1.1742  1.1566  1.1392
                  1.1219  1.1047  1.0878  1.0710  1.0543  1.0379  1.0214
                  1.0051   .9890   .9731   .9573   .9416   .9260   .9106
                   .8952   .8801   .8650   .8500   .8352   .8205   .8059
                   .7914   .7770   .7628   .7486   .7346   .7204   .7068
                   .6930   .6794   .6658   .6524   .6390   .6258   .6126
                   .5995   .5865   .5736   .5608   .5481   .5355   .5229
                   .5104   .4981   .4858   .4735   .4614   .4493   .4373
                   .4254   .4136   .4018   .3901   .3785   .3669   .3554
                   .3440   .3327   .3214   .3102   .2991   .2880   .2770
                   .2660   .2552   .2443   .2336   .2229   .2123   .2017
                   .1912   .1807   .1703   .1600   .1497   .1394   .1293
                   .1192   .1091   .0991   .0891   .0792   .0694   .0595
                   .0498   .0401   .0304   .0208   .0113   .0000

      K =  1.070112HR    TP =  2.058300HR    K/TP RATIO =   .519901     SHAPE
CONSTANT, N =  7.352117
      UNIT PEAK =   2.3082    CFS   UNIT VOLUME =    .9746       B =   544.85

      AREA =      .008688 SQ MI    IA =    .10000 INCHES    INF =    .04000 I
NCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD


      K =  1.768084HR    TP =  2.058300HR    K/TP RATIO =   .859002     SHAPE
CONSTANT, N =  4.140090
      UNIT PEAK =   959.80    CFS   UNIT VOLUME =    .9258       B =   364.40

      AREA =     5.421312 SQ MI    IA =    .39997 INCHES    INF =   2.09981 I
```

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = .94361 INCHES = 273.2668 ACRE-FEET
PEAK DISCHARGE RATE = 985.75 CFS AT 2.433 HOURS

FINISH

END TIME (HR:MIN:SEC) = 10:27:41

$$273.2668\ ac\text{-}ft \times \frac{43560\ ft^2}{ac} = 11{,}903{,}501.8\ ft^3$$

$$11{,}903{,}501.8\ ft^3 \times \left(\frac{3yd}{3ft}\right)^3 = 440{,}870\ cy$$

EARTHWORK SUMMARY

22 Jun 1990

SOILS AMENDMENT FACILITY
VOLUMES AT ELEVATION 5862 (Existing Playa Capacity)

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<*>>

GROUND SURFACE TNET FILE: MS8333TN1
DESIGN SURFACE TNET FILE: MS8333TN3

GROUND SURFACE CORD FILE: MS8333CRD
DESIGN SURFACE CORD FILE: MS8333CRD

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<*>>

GROUND SURFACE ADJUSTMENT (ft)	+0.00	PRECISION RATIO	18/1
SWELL FACTOR (ROCK EXCAVATION)	0%	AVERAGE INCREMENTAL AREA (sf)	1488
SHRINKAGE FACTOR (COMPACTION)	0%	TOTAL EXCLUDED AREA (ac)	0.000
		COMPUTATION TIME	00:07:18

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<*>>

VOLUME OF BANK CUT (cy)	0	TOTAL SURFACE AREA (ac)	171.524
VOLUME OF BANK FILL (cy)	831342	AREA OF CUT (ac)	0.000
VOLUME OF ADJUSTED CUT (cy)	0	AREA OF FILL (ac)	170.342
VOLUME OF ADJUSTED FILL (cy)	831342	AVERAGE DEPTH OF CUT (ft)	0.000
SITE BALANCE (cy)	-831342	AVERAGE DEPTH OF FILL (ft)	3.025

$$831342\ yd^3 \times \left(\frac{3ft}{yd}\right)^3 \times \frac{ac}{43560\ ft^2} = 515.3\ ac\text{-}ft.$$

EARTHWORK SUMMARY

29 Jun 1990

SOILS AMENDMENT FACILITY
VOLUMES AT ELEVATION 5860.11 (100-year, 24-hour flood elevation)

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<*>>

GROUND SURFACE TNET FILE: MS8333TN1
DESIGN SURFACE TNET FILE: MS8333TN4
GROUND SURFACE CORD FILE: MS8333CRD
DESIGN SURFACE CORD FILE: MS8333CRD

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<*>>

GROUND SURFACE ADJUSTMENT (ft)	+0.00	PRECISION RATIO	10/1
SWELL FACTOR (ROCK EXCAVATION)	0%	AVERAGE INCREMENTAL AREA (sf)	1142
SHRINKAGE FACTOR (COMPACTION)	0%	TOTAL EXCLUDED AREA (ac)	0.000
		COMPUTATION TIME	00:05:49

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<*>>

VOLUME OF BANK CUT (cy)	0	TOTAL SURFACE AREA (ac)	105.688
VOLUME OF BANK FILL (cy)	440906	AREA OF CUT (ac)	0.000
VOLUME OF ADJUSTED CUT (cy)	0	AREA OF FILL (ac)	105.056
VOLUME OF ADJUSTED FILL (cy)	440906	AVERAGE DEPTH OF CUT (ft)	0.000
SITE BALANCE (cy)	-440906	AVERAGE DEPTH OF FILL (ft)	2.601

$$440906\ yd^3 \times \left(\frac{3ft}{yd}\right)^3 \times \frac{ac}{43560\ ft^2} = 273.3\ ac\text{-}ft.$$

CALCULATED BY Jack DATE 7-6-90	CLIENT C.O.A. PROJECT NO.
CHECKED BY DATE	PROJECT M-S 83-33 X 13
SHEET NO. OF	SUBJECT SAF FEMA Revision

UNIVERSAL SOIL LOSS EQUATION (USLE)

$A = RKLSCP$ (Ref. USDA, Agr. Handbook No. 537)

$R = 25$
$K = 0.6$
$LS = 0.7$
$C = 0.36$
$P = 1.0$

$\therefore A = 3.78 \frac{\text{tons sediment}}{\text{acre}}/\text{year}$

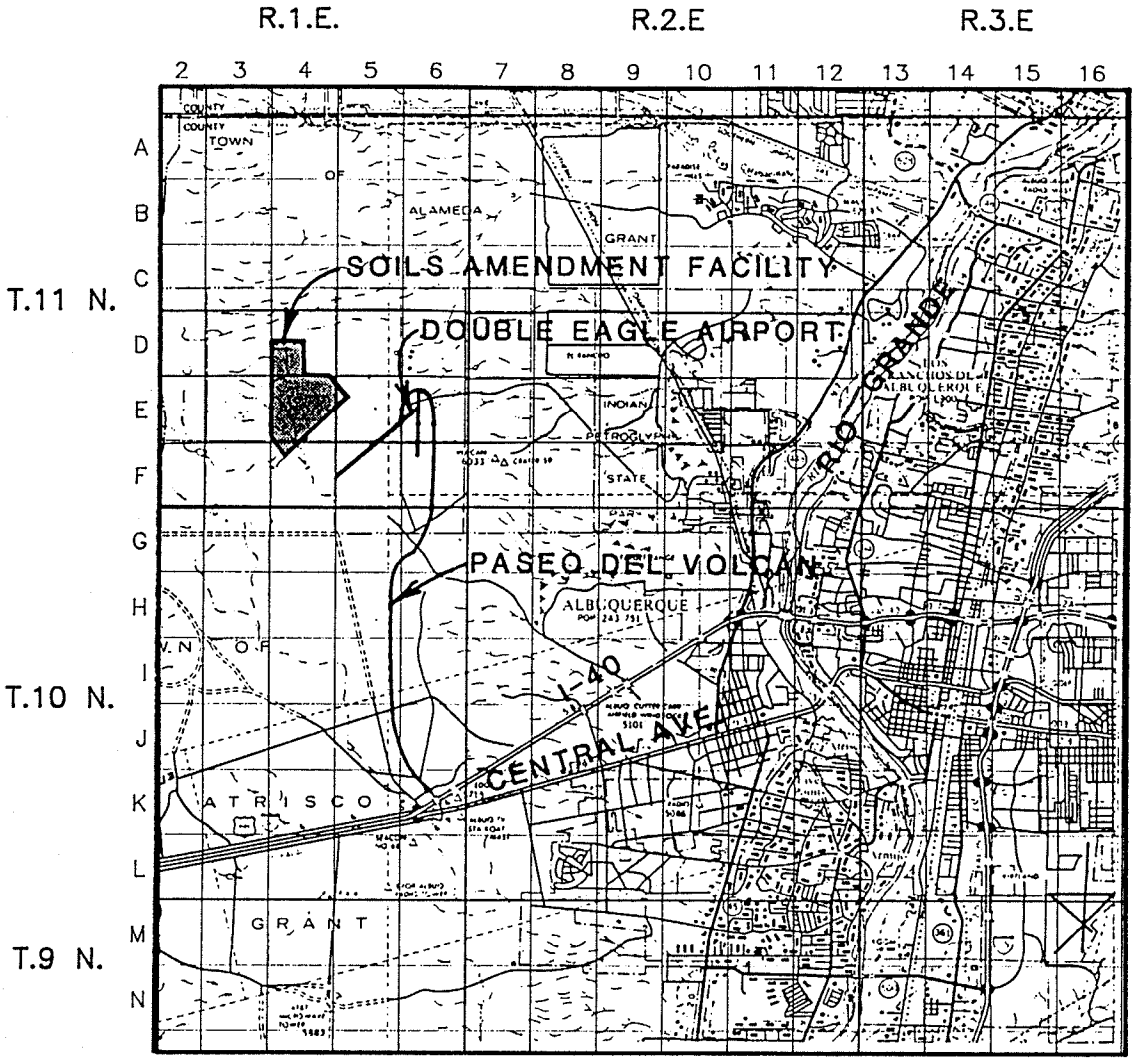
For a 50 year period:

$$3.78 \frac{\text{tons}}{\text{acre}} \times 3472.5 \text{ ac} \times \frac{2000 \text{ lb}}{\text{ton}} \times \frac{\text{ft}^3}{110 \text{ lb}} \times \frac{\text{ac}}{43560 \text{ ft}^2}$$

$= 5.48$ ac-ft/year $\times$ 50 years

$= 273.9$ ac-ft.

Note: This is conservative and does not take into account wind erosion from the Playa



LOCATION MAP

ZONE ATLAS MAP NOS. D–4, E–4 & 5, AND F–4

LOCATION MAP

EXHIBIT II

1528

9076027

GRANT OF EASEMENT
for
FLOOD PLAIN

The City of Albuquerque, New Mexico, a municipal corporation, Grantors, for good and valuable consideration, the receipt of which is hereby acknowledged, does grant, bargain, sell and convey unto the ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA), a political subdivision of the State of New Mexico, and its successors and assigns, the permanent right and easement to convey storm water and to construct, reconstruct, operate and maintain storm drainage improvements on, in, under, over, and across the following described real estate.

The land in which the foregoing rights and easements are granted is located in the City of Albuquerque, County of Bernalillo and State of New Mexico and is more particularly described in Exhibit "A" attached hereto and incorporated herein by reference.

Except by written approval from AMAFCA, no obstruction may be placed or maintained in said easement and there shall be no alteration of grades or contours in said easement area. The granting of this easement shall not obligate AMAFCA to maintain natural arroyos, drainage channels, or facilities that do not meet the standards of AMAFCA for design and construction, nor shall this granting require the protection of property lying outside of the easement hereby granted.

TO HAVE AND TO HOLD the said right and easement for the uses and purposes aforesaid, unto the AMAFCA, its successors and assigns, forever, except that any portion of the easement granted herein shall revert to the Grantor, its successors or assigns, as and to the extent said portion is declared unnecessary for flood control or drainage by the Board of Directors of the Albuquerque Metropolitan Arroyo Flood Control Authority. Any reversion shall be conveyed by quitclaim deed.

THERE IS RESERVED to the Grantor, its successors and assigns, the right to use said lands for open space landscaping and other purposes which will not interfere with the rights and easements hereby granted, provided that Grantor obtains AMAFCA's written approval for such use, not to be unreasonably withheld.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

90 SEP 28 PM 3:26

BK 90-16 PG 1528-1533
GLADYS M. DAVIS
CO CLERK & RECORDER
DEPUTY

GRANTOR:

WITNESS its hand and seal this 7th day of September, 1990.

Arthur A. Blumenfeld
Chief Administrative Officer
City of Albuquerque
A Municipal Corporation

ACKNOWLEDGEMENT

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 7th day of September, 1990, by Arthur a . Blumenfeld, Chief Administrative Officer, City of Albuquerque, a municipal corporation, on behalf of said municipal corporation.

My Commission Expires:

4-2-94

Notary Public

GRANTEE:

Albuquerque Metropolitan Arroyo Flood Control Authority

Approved:

By:

Title: Executive Engineer

Date: 26 September 1990

EXHIBIT "A"

FLOOD PLAIN EASEMENT DESCRIPTION
(LOCATION TAKEN FROM CONTOURS ESTABLISHED FOR THE "FAR NORTHWEST DRAINAGE MANAGEMENT PLAN")

A PARCEL OF LAND SITUATE IN SECTIONS 22, 27, AND 34, TOWNSHIP 11 NORTH, RANGE 1 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, COUNTY OF BERNALILLO, STATE OF NEW MEXICO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID EASEMENT FROM WHENCE THE NORTHWEST CORNER OF TRACT I, SOILS AMENDMENT FACILITY BEARS N 89 DEGREES 56' 15" W, A DISTANCE OF 1260.21 FEET:

THENCE, S 89 DEGREES 56' 15" E, A DISTANCE OF 263.95 FEET, ALONG THE NORTHERLY BOUNDARY OF SAID TRACT A, TO A POINT,

THENCE, S 13 DEGREES 57' 08" E, A DISTANCE OF 302.95 FEET TO A POINT,

THENCE, S 09 DEGREES 53' 45" E, A DISTANCE OF 364.74 FEET TO A POINT,

THENCE, S 13 DEGREES 25' 32" E, A DISTANCE OF 316.80 FEET TO A POINT,

THENCE, S 01 DEGREES 04' 34" E, A DISTANCE OF 501.09 FEET TO A POINT,

THENCE, S 06 DEGREES 50' 32" W, A DISTANCE OF 357.83 FEET TO A POINT,

THENCE, S 00 DEGREES 04' 18" E, A DISTANCE OF 465.56 FEET TO A POINT,

THENCE, S 09 DEGREES 01' 01" E, A DISTANCE OF 468.46 FEET TO A POINT,

THENCE, S 05 DEGREES 13' 45" E, A DISTANCE OF 363.75 FEET TO A POINT,

THENCE, S 06 DEGREES 11' 18" W, A DISTANCE OF 340.54 FEET TO A POINT,

THENCE, S 02 DEGREES 29' 47" W, A DISTANCE OF 345.79 FEET TO A POINT,

THENCE, S 07 DEGREES 01' 07" E, A DISTANCE OF 367.96 FEET TO A POINT,

THENCE, S 29 DEGREES 10' 25" E, A DISTANCE OF 455.63 FEET TO A POINT,

THENCE, S 31 DEGREES 52' 17" E, A DISTANCE OF 424.42 FEET TO A POINT,

THENCE, S 16 DEGREES 23' 27" E, A DISTANCE OF 313.00 FEET TO A POINT,

THENCE, S 08 DEGREES 39' 51" E, A DISTANCE OF 396.31 FEET TO A POINT,

THENCE, S 08 DEGREES 14' 14" W, A DISTANCE OF 138.22 FEET TO A POINT,

THENCE, S 33 DEGREES 32' 46" E, A DISTANCE OF 165.43 FEET TO A POINT,

THENCE, S 06 DEGREES 40' 24" W, A DISTANCE OF 153.59 FEET TO A POINT,

THENCE, S 01 DEGREES 40' 50" E, A DISTANCE OF 293.45 FEET TO A POINT,

THENCE, S 04 DEGREES 52' 58" E, A DISTANCE OF 194.62 FEET TO A POINT,

THENCE, S 15 DEGREES 47' 29" W, A DISTANCE OF 152.37 FEET TO A POINT,

THENCE, S 55 DEGREES 17' 40" E, A DISTANCE OF 275.21 FEET TO A POINT,

THENCE, N 82 DEGREES 27' 46" E, A DISTANCE OF 146.12 FEET TO A POINT,

THENCE, S 46 DEGREES 30' 17" W, A DISTANCE OF 1155.42 FEET TO A POINT,

THENCE, N 39 DEGREES 48' 26" W, A DISTANCE OF 14.25 FEET TO A POINT,

THENCE, N 27 DEGREES 18' 23" W, A DISTANCE OF 287.02 FEET TO A POINT,

THENCE, N 02 DEGREES 01' 28" E, A DISTANCE OF 57.12 FEET TO A POINT,

THENCE, N 16 DEGREES 32' 17" E, A DISTANCE OF 128.31 FEET TO A POINT,

THENCE, N 12 DEGREES 50' 40" W, A DISTANCE OF 83.81 FEET TO A POINT,

THENCE, N 35 DEGREES 08' 26" W, A DISTANCE OF 490.18 FEET TO A POINT,

THENCE, N 30 DEGREES 17' 47" W, A DISTANCE OF 453.93 FEET TO A POINT,

THENCE, N 21 DEGREES 24' 35" W, A DISTANCE OF 489.66 FEET TO A POINT,

THENCE, N 31 DEGREES 29' 07" W, A DISTANCE OF 254.06 FEET TO A POINT,

THENCE, N 06 DEGREES 52' 18" W, A DISTANCE OF 171.53 FEET TO A POINT,

THENCE, N 16 DEGREES 17' 36" E, A DISTANCE OF 415.20 FEET TO A POINT,

THENCE, N 06 DEGREES 46' 50" E, A DISTANCE OF 461.85 FEET TO A POINT,

THENCE, N 01 DEGREES 08' 02" E, A DISTANCE OF 312.07 FEET TO A POINT,

THENCE, N 25 DEGREES 03' 55" W, A DISTANCE OF 104.36 FEET TO A POINT,

THENCE, N 28 DEGREES 53' 47" W, A DISTANCE OF 201.33 FEET TO A POINT,

THENCE, N 07 DEGREES 09' 33" W, A DISTANCE OF 251.00 FEET TO A POINT,

THENCE, N 47 DEGREES 49' 11" E, A DISTANCE OF 86.40 FEET TO A POINT,

THENCE, N 00 DEGREES 46' 09" W, A DISTANCE OF 482.34 FEET TO A POINT,

THENCE, N 03 DEGREES 18' 33" W, A DISTANCE OF 420.02 FEET TO A POINT,

THENCE, N 08 DEGREES 14' 04" E, A DISTANCE OF 290.36 FEET TO A POINT,

THENCE, N 09 DEGREES 14' 59" E, A DISTANCE OF 141.59 FEET TO A POINT,

THENCE, N 21 DEGREES 14' 13" W, A DISTANCE OF 81.34 FEET TO A POINT,

THENCE, N 06 DEGREES 31' 40" E, A DISTANCE OF 270.43 FEET TO A POINT,

THENCE, N 28 DEGREES 22' 54" W, A DISTANCE OF 175.72 FEET TO A POINT,

THENCE, N 08 DEGREES 36' 40" W, A DISTANCE OF 150.34 FEET TO A POINT,

THENCE, N 45 DEGREES 44' 07" W, A DISTANCE OF 101.62 FEET TO A POINT,

THENCE, N 06 DEGREES 29' 14" W, A DISTANCE OF 95.11 FEET TO A POINT,

THENCE, N 24 DEGREES 30' 43" E, A DISTANCE OF 251.95 FEET TO A POINT,

THENCE, N 13 DEGREES 41' 10" E, A DISTANCE OF 342.33 FEET TO A POINT,

THENCE, N 11 DEGREES 22' 49" W, A DISTANCE OF 461.92 FEET TO A POINT,

THENCE, N 00 DEGREES 25' 41" W, A DISTANCE OF 118.12 FEET TO A POINT,

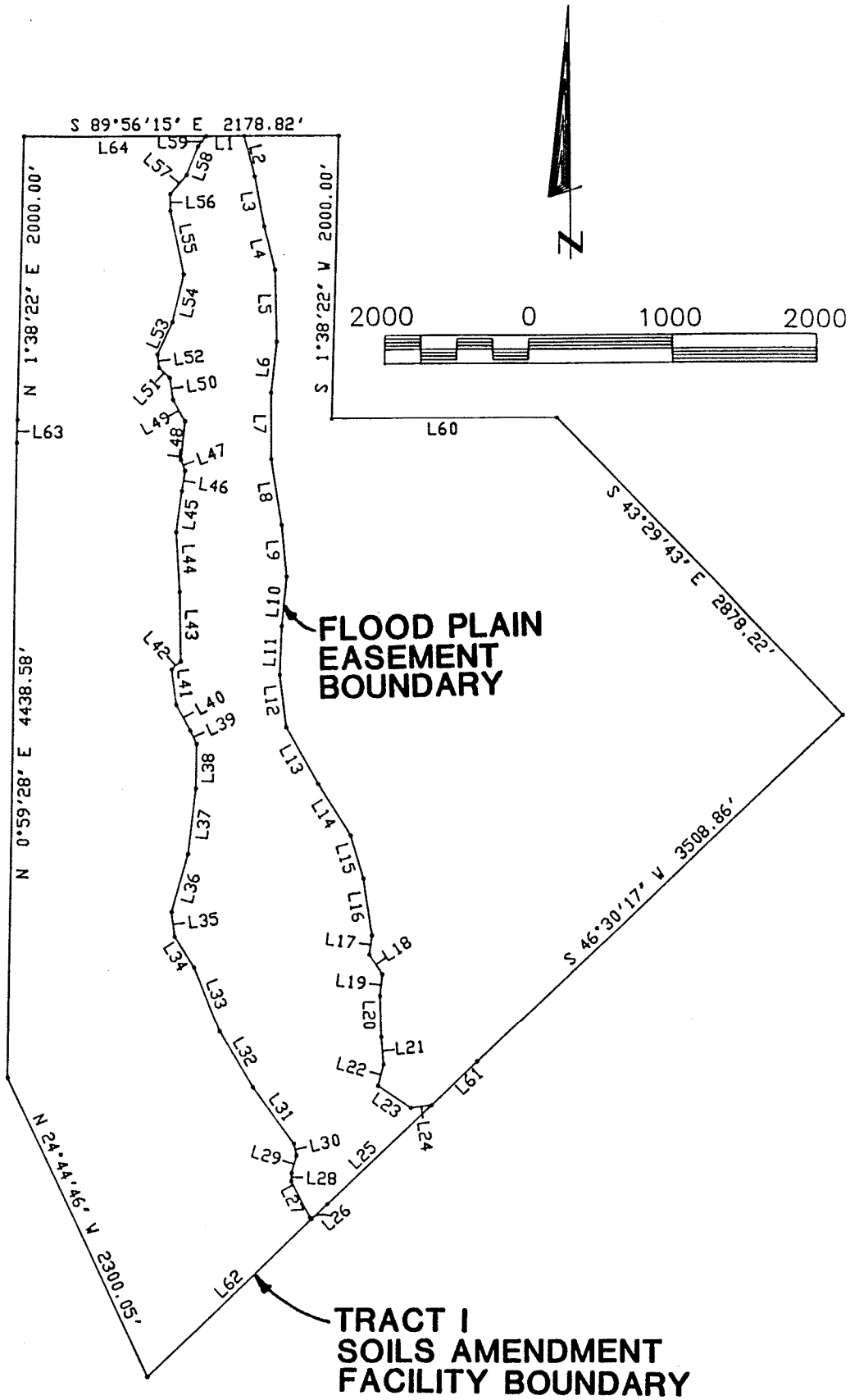
THENCE, N 40 DEGREES 10' 32" E, A DISTANCE OF 180.21 FEET TO A POINT,

THENCE, N 20 DEGREES 50' 48" E, A DISTANCE OF 219.00 FEET TO A POINT,

THENCE, N 37 DEGREES 40' 32" E, A DISTANCE OF 94.09 FEET TO THE POINT OF BEGINNING.

CONTAINING 139.8490 ACRES, MORE OR LESS.

LINE	BEARING	DISTANCE
L1	S 89°56'15" E	263.95
L2	S 13°57'08" E	302.95
L3	S 9°53'45" E	364.74
L4	S 13°25'32" E	316.80
L5	S 1°04'34" E	501.09
L6	S 6°50'32" W	357.83
L7	S 0°04'18" E	465.56
L8	S 9°01'01" E	468.46
L9	S 5°13'45" E	363.75
L10	S 6°11'18" W	340.54
L11	S 2°29'47" W	345.79
L12	S 7°01'07" E	367.96
L13	S 29°10'25" E	455.63
L14	S 31°52'17" E	424.42
L15	S 16°23'27" E	313.00
L16	S 8°39'51" E	396.31
L17	S 8°14'14" W	138.22
L18	S 33°32'46" E	165.43
L19	S 6°40'24" W	153.59
L20	S 1°40'50" E	293.45
L21	S 4°52'58" E	194.62
L22	S 15°47'29" W	152.37
L23	S 55°17'40" E	275.21
L24	N 82°27'46" E	146.12
L25	S 46°30'17" W	1155.42
L26	N 39°48'26" W	14.25
L27	N 27°18'23" W	287.02
L28	N 2°01'28" E	57.12
L29	N 16°32'17" E	128.31
L30	N 12°50'40" W	83.81
L31	N 35°08'26" W	490.18
L32	N 30°17'47" W	453.93
L33	N 21°24'35" W	489.66
L34	N 31°29'07" W	254.06
L35	N 6°52'18" W	171.53
L36	N 16°17'36" E	415.20
L37	N 6°46'50" E	461.85
L38	N 1°08'02" E	312.07
L39	N 25°03'55" W	104.36
L40	N 28°53'47" W	201.33
L41	N 7°09'33" W	251.00
L42	N 47°49'11" E	86.40
L43	N 0°46'09" W	482.34
L44	N 3°18'33" W	420.02
L45	N 8°14'04" E	290.36
L46	N 9°14'59" E	141.59
L47	N 21°14'13" W	81.34
L48	N 6°31'40" E	270.43
L49	N 28°22'54" W	175.72
L50	N 8°36'40" W	150.34
L51	N 45°44'07" W	101.62
L52	N 6°29'14" W	95.11
L53	N 24°30'43" E	251.95
L54	N 13°41'10" E	342.33
L55	N 11°22'49" W	461.92
L56	N 0°25'41" W	118.12
L57	N 40°10'32" E	180.21
L58	N 20°50'48" E	219.00
L59	N 37°40'32" E	94.09
L60	S 89°56'15" E	1564.12
L61	S 46°30'17" W	1441.97
L62	S 46°30'17" W	1724.62
L63	N 1°38'22" E	160.01
L64	S 89°56'15" E	1260.21



CALCULATED BY RAP DATE 11/14/91	CLIENT COA PROJECT NO. X-19 M-SB2-15
CHECKED BY ____ DATE ____	PROJECT SAF - FEMA MAP REVISION
SHEET NO. 1 OF 3	SUBJECT HYDROLOGY

OUR REVIEW OF THE 1"=500' MAPPING USED IN THE "FAR NORTHWEST DRAINAGE MANAGEMENT PLAN" REVEALED THAT SOME MODIFICATIONS TO THE HYDROLOGY USED IN OUR JULY, 1990 ANALYSIS IS NECESSARY. ~~THE REVISED HYDROLOGY~~ IS DEVELOPED BELOW ——

Only the 1"=200' mapping was supplied. Will 1"=500 mapping of basin also be included?

BASIN ① — AREA = 2.17 SQ MI.
LENGTH = 19,500'
ΔH = 6110 - 5980 = 130'
S = 0.0067 (0.67%)

t_c - USE METHOD #3, P 15, COA-DPM 8/91 REVISION

$$L_g = (26)(0.033)\left((19{,}500)\left(8{,}000'/(5280)^2((0.67)(52.8))^{0.5}\right)\right)^{0.33}$$ OK

$= 0.84$ HRS

$t_c = (4/3)(0.84)(60)$

$= 67$ MIN $\longrightarrow$ $t_p = 2/3(67) = 45$ MIN.
$= 0.75$ HR ✓

LAND TREATMENT - A = 99 ✓ OK
B = 1
C = 0
D = 0

```
!!!!!!!!!!!!!!!!! MOLZEN-CORBIN AND ASSOCIATES !!!!!!!!!
!!!!!!   NOVEMBER, 1991  !!!!!!!!!!!!!!!!!!!!!!
!!!!!!   DRAINAGE AT SAF SITE !!!!!!!!!!
!!!! 100 YEAR - 24 HOUR STORM !!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!
!! SAF PLAYA LAKE BASIN PEAK FLOW RATE AND VOLUME !!!!!!
START              0.00
!!!!!!!!!!!!!!!!!!!!!!!!
RAINFALL           TYPE=2 RAIN QUARTER=0.0 RAIN ONE=1.87
                   RAIN SIX=2.20  RAIN DAY=2.66  DT=0.03333
!!! CALCULATE FLOW FROM BASIN 1 !!!
COMPUTE NM HYD     ID=1 HYD NO=101 DA= 2.17 SQ MI
                   PER A=99  PER B=1  PER C=0 PER D=0
                   TP=-0.75  RAIN=-1
PRINT HYD          ID=1 CODE=10
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
                   MIN ELEV=5951 FT   MAX ELEV=5960 FT
                   CH SLP=0.0114    FP SLP=0.0114  N=0.035
                   DIST=840
                   DIST ELEV  DIST ELEV  DIST ELEV  DIST ELEV
                      0 5960    70 5958   190 5956   240 5954
                    290 5952   410 5951   540 5952   610 5954
                    660 5956   720 5958   840 5960
COMPUTE TRAVEL TIME ID=10 REACH=1 VS NO=1 L=2200 SLP=0.0114
ROUTE              ID=10 HYD=101.1 INFLOW ID=1 DT=0.03333 HR
PRINT HYD          ID=10 CODE=10
!!! CALCULATE FLOW FROM BASIN 2 !!!
COMPUTE NM HYD     ID=2 HYD NO=102 DA= 0.84 SQ MI
                   PER A=98  PER B=2  PER C=0 PER D=0
                   TP=-0.43  RAIN=-1
PRINT HYD          ID=2 CODE=10
ADD HYD            ID=3 HYD=102.1 ID I=10 II=2
PRINT HYD          ID=3 CODE=10
!!! CALCULATE FLOW FROM BASIN 3 !!!
COMPUTE NM HYD     ID=4 HYD NO=104 DA= 2.75 SQ MI
                   PER A=90  PER B=0  PER C=8 PER D=2
                   TP=-0.55  RAIN=-1
PRINT HYD          ID=4 CODE=10
ADD HYD            ID=5 HYD=105 ID I=3 II=4
PRINT HYD          ID=5 CODE=10
FINISH
```

with 24 hour storm use DT=0.05 hours to set all of rainfall volume in 600 hydrograph points. See OPM.

EARTHWORK SUMMARY

22 Jun 1990

SOILS AMENDMENT FACILITY
VOLUMES AT ELEVATION 5862 (Existing Playa Capacity)

GROUND SURFACE TNET FILE: MS8333TN1
DESIGN SURFACE TNET FILE: MS8333TN3
GROUND SURFACE CORD FILE: MS8333CRD
DESIGN SURFACE CORD FILE: MS8333CRD

GROUND SURFACE ADJUSTMENT (ft)	+0.00	PRECISION RATIO	1:1
SWELL FACTOR (ROCK EXCAVATION)	0%	AVERAGE INCREMENTAL AREA (sf)	1488
SHRINKAGE FACTOR (COMPACTION)	0%	TOTAL EXCLUDED AREA (ac)	0.000
		COMPUTATION TIME	00:07:18

VOLUME OF BANK CUT (cy)	0	TOTAL SURFACE AREA (ac)	171.524
VOLUME OF BANK FILL (cy)	831342	AREA OF CUT (ac)	0.000
VOLUME OF ADJUSTED CUT (cy)	0	AREA OF FILL (ac)	170.342
VOLUME OF ADJUSTED FILL (cy)	831342	AVERAGE DEPTH OF CUT (ft)	0.000
SITE BALANCE (cy)	-831342	AVERAGE DEPTH OF FILL (ft)	3.025

$$831342\ yd^3 \times \left(\frac{3ft}{yd}\right)^3 \times \frac{ac}{43560\ ft^2} = 515.3\ ac\text{-}ft.$$

How was volume of pond computed?
What is stage-storage-discharge curve or table?
Was prismoidal formula used or average end area?

CALCULATED BY RAP DATE 11/14/91	CLIENT COA PROJECT NO. M-583-39 (X-19)
CHECKED BY ____ DATE ____	PROJECT SAF - FEMA MAP REVISION
SHEET NO. 1 OF 2	SUBJECT SEDIMENT YIELD

OUR PREVIOUS ANALYSIS USING THE "UNIVERSAL SOIL LOSS EQUATION" (USLE) TOOK TYPICAL VALUES FOR THE VARIABLES IN THE EQUATION. IN THE PAST YEAR, WE HAVE DONE TWO PROJECTS IN THE WEST MESA AREA THAT HAVE YIELDED VALUES MORE REPRESENTATIVE TO THE SITE. THE REVISED ANALYSIS FOLLOWS:

(May need to include these unpublished documents in an appendix.

USLE: $A = RKLSCP$ (USDA AGR. ~~HANDBOOK~~ NO. 537)

$R = 50$
$K = 0.42$
$LS = 0.22$
$C = 0.40$
$P = 1.0$

$\therefore A = 1.85$ TONS/AC-YR

FOR A 50 YEAR PERIOD:

$$(1.85 \text{ TONS/AC})(3686.4 \text{ AC})\left(\frac{2000 \text{ \#}}{\text{TON}}\right)\left(\frac{\text{FT}^3}{110 \text{ \#}}\right)\left(\frac{\text{AC}}{43{,}560 \text{ FT}^2}\right)$$

$= 2.85$ AC-FT/YEAR $\times$ 50 YRS

$= 142.5$ AC-FT

NOTE: THIS ANALYSIS IS CONSERVATIVE AND DOES NOT TAKE INTO ACCOUNT WIND EROSION FROM THE PLAYAS —

CALCULATED BY RAP DATE 11/14/91	CLIENT COA PROJECT NO. X-19 M-583-39
CHECKED BY ____ DATE ____	PROJECT SAF - FEMA MAP REVISION
SHEET NO. 2 OF 2	SUBJECT SEDIMENT YIELD

OUR ANALYSES FOR THE TWO PROJECTS ALSO GENERATED A MULTIPLIER TO COMPARE THE ANNUAL SEDIMENT YIELD TO THE SEDIMENT YIELD FROM A 100-YR STORM. THIS MULTIPLIER IS 6.66.

100-YR SEDIMENT YIELD —

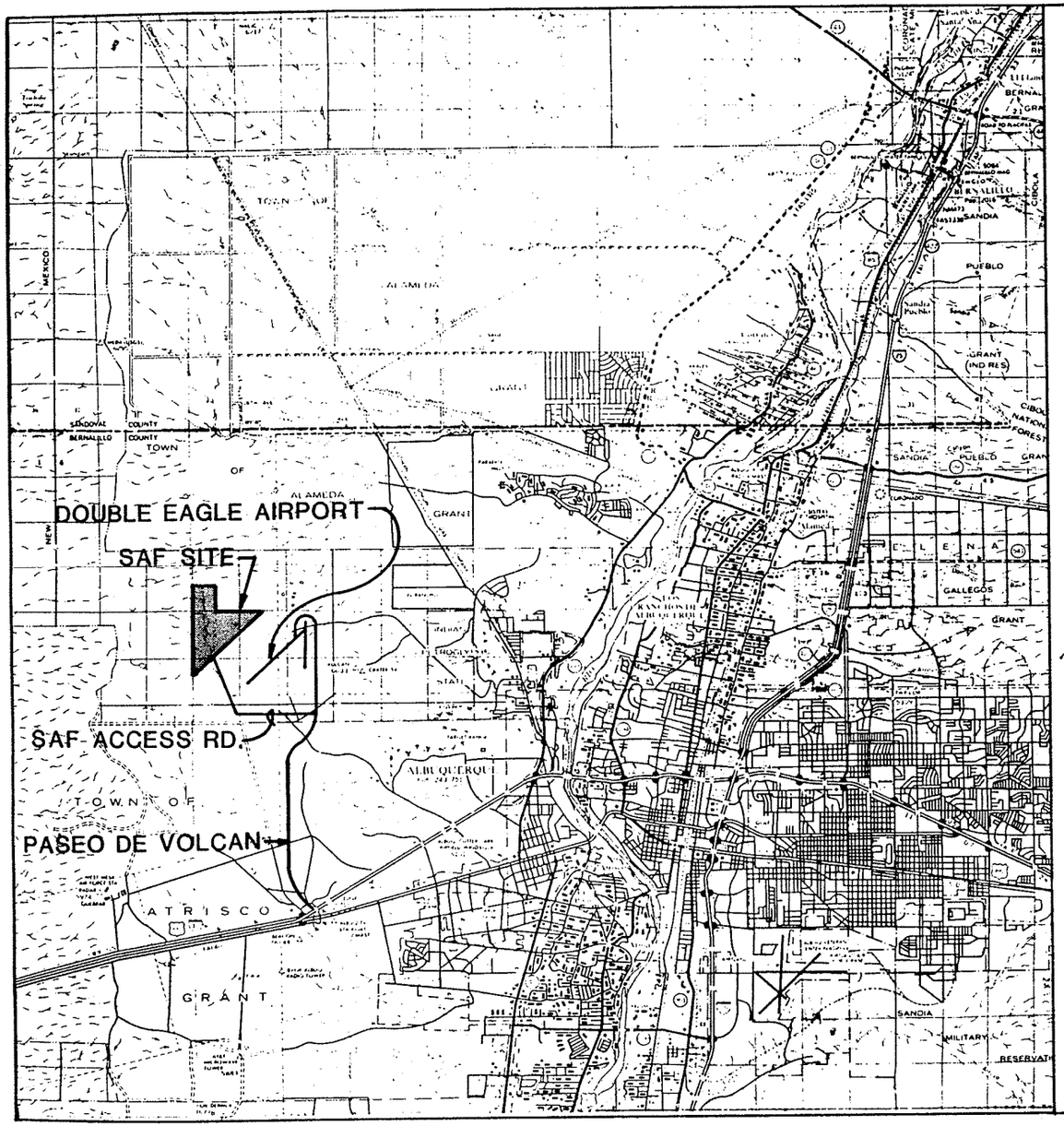
$(1.85\ \text{AC-FT/YR})(6.66) = 18.98\ \text{AC-FT}$

Is 1.85 Ac FT expected volume to accumulate (working level for maintence)?

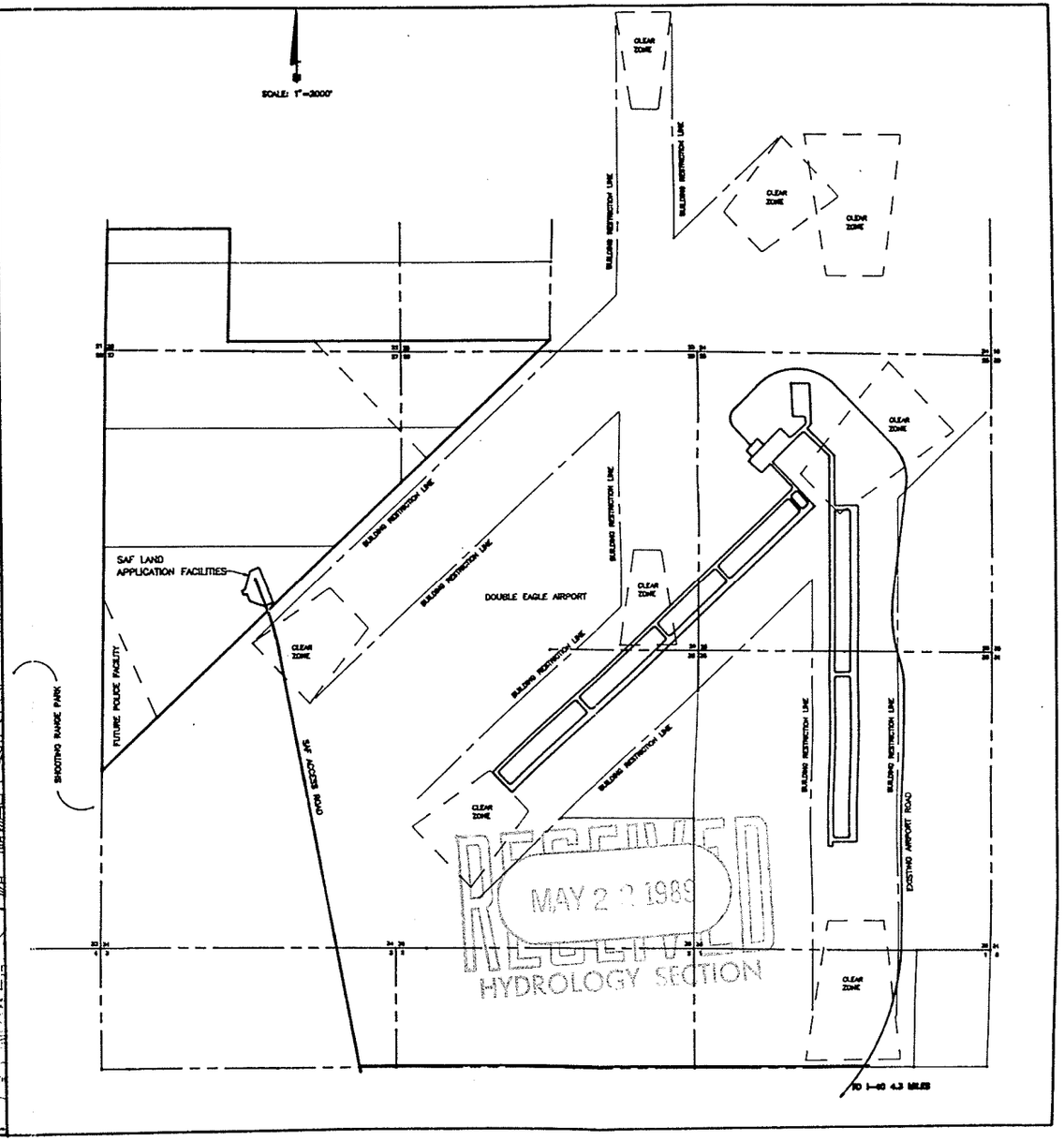
Or on 2 or 3 year cycle.

How high can sediment get without maintenance?

Then add 100-year sediment volume and 100-year storm volume.



LOCATION MAP



VICINITY MAP

DESIGNED C. LEDER DRAWN C. SPINELLO CHECKED C. LEDER APPROVED APPROVED DATE 12-88	MOLZEN-CORBIN STANLEY CONSULTANTS A JOINT VENTURE	CITY OF ALBUQUERQUE, NEW MEXICO SOILS AMENDMENT FACILITY PHASE II B-3, CONTRACT 5	M-C NO. SAF VICINITY MAP EXHIBIT "A"

STA. 5+00.00
CHANNEL B
INV. EL.=5848.00
DEPTH=4.50

111' TO ℄

5848.00
DEPTH=3.00'

℄ CHANNEL B

N 43°-29'-43" W

STA. 0+00 CHANNEL A
STA. 0+00 CHANNEL B

EXISTING
POND A

℄ CHANNEL A

3H:IV TYPICAL

797.33'

N 06°-22'-15" W

5848.00

N 30°-45'-12" E

111'

5830

5840

EXIST.
GAS LINE

DITCH AND DIKE

111' TO ℄

N 43°-29'-43" W

N 10,000
E 10,000

EXISTING
POND B
INV. EL = 5845.00

DITCH & DIKE

5845.00
DEPTH =3.00'

200'

5845.00
DEPTH = 2.00'

EXISTING
POND B

111' TO ℄

5850

50'

720'

23 26
22 27

EXISTING
DITCH & DIKE

5845.00
DEPTH=3.00'

3H:IV TYPICAL

2878.22'

N 43°-29'-43" W

2545'

EXISTING
POND A
INV. EL. = 5848.00

200' S 46°-30'-17" W

5845.00
DEPTH=3.00'

50'

STA. 24-70
CHANNEL A
INV. EL.=5859.03

5860

EXISTING
DRAINAGE CHANNEL
SEE DETAIL THIS SHEET

STA. 5+00.00
CHANNEL A
INV. EL. = 5848.00
DEPTH = 4.00'

DITCH AND DIKE

N 30°-45'-12" E

STA. 20+60.00 P.I.
CHANNEL B
INV. EL. = 5864.85

RETENTION POND DETAILS

STA. 37+20.00
CHANNEL A
INV. EL. = 5866.03

S 10°-32'-18" E

FUTURE BUILDINGS

show limits of natural grnd to remain

SPILLWAY
ELEVATION = 5862

EXISTING
ACCESS ROAD

N

SCALE: 1" = 400'

S 89°-56'-22" E

EXISTING
DRAINAGE
CHANNEL
SEE DETAIL THIS SHEET

5870

EXISTING BUILDING

EXISTING FACILITY

STA. 34+50.00
CHANNEL B
INV. EL. = 5879.86

5880

S 46°-30'-17" W

5870

5880

100 YEAR FLOOD PLAIN
ELEVATION=5858.46

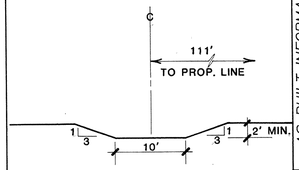
PLAYA LAKE

5860

5870

22 27
21 28

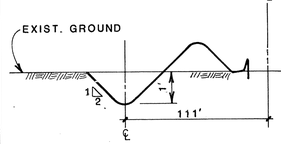
Legend



TYPICAL CHANNEL SECTION

NOTE :

CONTRACTOR SHALL NOT PLACE EXCESS MATERIAL FROM EXCAVATION IN THE DESIGNATED EMERGENCY SPILLWAY AREA. EMERGENCY SPILLWAY IS NOT TO BE CONSTRUCTED BUT SHALL BE LEFT AS UNDISTURBED NATURAL GROUND.



TYPICAL DITCH & DIKE SECTION

RETENTION POND INFORMATION:

POND A	POND B
A=195 AC.	A=21 Ac.
Tc=0.45 Hr.	Tc=0.31 Hr.
P_{100}=2.20 In.	P_{100}=2.20 In
CN=75	CN=75
Q_{100}=94cfs	Q_{100}=13cfs
V_{100}=7.85 AcFt	V_{100}=0.84 AcFt
Vact.=9.20 AcFt	Vact.=1.01 AcFt

JAN 6 1992

CITY OF ALBUQUERQUE, NEW MEXICO
SOLIDS HANDLING FACILITIES
PHASE II B-3, CONTRACT 2

MOLZEN-CORBIN
STANLEY CONSULTANTS
A JOINT VENTURE

AS BUILT INFORMATION

CONTRACTOR — DATE
WORK STAKED BY
INSPECTED BY — DATE
ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

BENCH MARKS

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE

ENGINEER'S SEAL

JACK E. S. McDONNELL
NEW MEXICO
10803
REGISTERED PROFESSIONAL ENGINEER

Rec. 1-31-92

NO.	DATE	REMARKS	BY
1	12/87	MOVED POND A & ADDED POND B	K.S.F

REVISIONS

DESIGN — DATE 4/89
DESIGNED BY KSF/JSH
DRAWN BY STAFF — DATE "
CHECKED BY KSF — DATE "

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
LIQUID WASTE DIVISION

TITLE: SAF-PILOT COMPOST FACILITY

DRAINAGE PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Liquid Waste		
A.C.E.-Design			Traffic		
A.C.E.-Hydrology			Water		

DRAWING NO. | MAP NO. | SHEET OF

EXHIBIT III

STA. 5+00.00
CHANNEL B
INV. EL.=5848.00
DEPTH=4.50

111' TO ℄

5848.00
DEPTH=3.00'

℄ CHANNEL B

N 43°-29'-43" W

STA. 0+00 CHANNEL A
STA. 0+00 CHANNEL B

EXISTING
POND A

℄ CHANNEL A

3H:IV TYPICAL

797.33'

N 06°-22'-15" W

5848.00

N 30°-45'-12" E

111'

5830

5840

EXIST.
GAS LINE

DITCH AND DIKE

111' TO ℄

N 43°-29'-43" W

N 10,000
E 10,000

EXISTING
POND B
INV. EL = 5845.00

DITCH & DIKE

5845.00
DEPTH =3.00'

200'

5845.00
DEPTH = 2.00'

EXISTING
POND B

111' TO ℄

5850

50'

720'

23 26
22 27

EXISTING
DITCH & DIKE

5845.00
DEPTH=3.00'

3H:IV TYPICAL

2878.22'

N 43°-29'-43" W

2545'

EXISTING
POND A
INV. EL. = 5848.00

200' S 46°-30'-17" W

5845.00
DEPTH=3.00'

50'

STA. 24-70
CHANNEL A
INV. EL.=5859.03

5860

EXISTING
DRAINAGE CHANNEL
SEE DETAIL THIS SHEET

STA. 5+00.00
CHANNEL A
INV. EL. = 5848.00
DEPTH = 4.00'

DITCH AND DIKE

N 30°-45'-12" E

STA. 20+60.00 P.I.
CHANNEL B
INV. EL. = 5864.85

RETENTION POND DETAILS

STA. 37+20.00
CHANNEL A
INV. EL. = 5866.03

S 10°-32'-18" E

FUTURE BUILDINGS

show limits of natural grnd to remain

SPILLWAY
ELEVATION = 5862

EXISTING
ACCESS ROAD

N

SCALE: 1" = 400'

S 89°-56'-22" E

EXISTING
DRAINAGE
CHANNEL
SEE DETAIL THIS SHEET

5870

EXISTING BUILDING

EXISTING FACILITY

STA. 34+50.00
CHANNEL B
INV. EL. = 5879.86

5880

S 46°-30'-17" W

5870

5880

100 YEAR FLOOD PLAIN
ELEVATION=5858.46

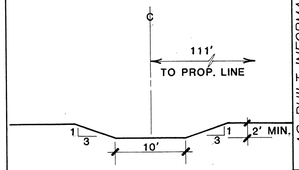
PLAYA LAKE

5860

5870

22 27
21 28

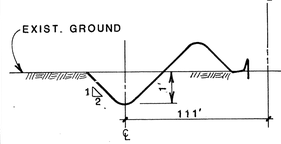
Legend



TYPICAL CHANNEL SECTION

NOTE :

CONTRACTOR SHALL NOT PLACE EXCESS MATERIAL FROM EXCAVATION IN THE DESIGNATED EMERGENCY SPILLWAY AREA. EMERGENCY SPILLWAY IS NOT TO BE CONSTRUCTED BUT SHALL BE LEFT AS UNDISTURBED NATURAL GROUND.



TYPICAL DITCH & DIKE SECTION

RETENTION POND INFORMATION:

POND A	POND B
A=195 AC.	A=21 Ac.
Tc=0.45 Hr.	Tc=0.31 Hr.
P_{100}=2.20 In.	P_{100}=2.20 In
CN=75	CN=75
Q_{100}=94cfs	Q_{100}=13cfs
V_{100}=7.85 AcFt	V_{100}=0.84 AcFt
Vact.=9.20 AcFt	Vact.=1.01 AcFt

JAN 6 1992

CITY OF ALBUQUERQUE, NEW MEXICO
SOLIDS HANDLING FACILITIES
PHASE II B-3, CONTRACT 2

MOLZEN-CORBIN
STANLEY CONSULTANTS
A JOINT VENTURE

AS BUILT INFORMATION

CONTRACTOR — DATE
WORK STAKED BY
INSPECTED BY — DATE
ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

BENCH MARKS

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE

ENGINEER'S SEAL

JACK E. S. McDONNELL
NEW MEXICO
10803
REGISTERED PROFESSIONAL ENGINEER

Rec. 1-31-92

NO.	DATE	REMARKS	BY
1	12/87	MOVED POND A & ADDED POND B	K.S.F

REVISIONS

DESIGN — DATE 4/89
DESIGNED BY KSF/JSH
DRAWN BY STAFF — DATE "
CHECKED BY KSF — DATE "

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
LIQUID WASTE DIVISION

TITLE: SAF-PILOT COMPOST FACILITY

DRAINAGE PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Liquid Waste		
A.C.E.-Design			Traffic		
A.C.E.-Hydrology			Water		

DRAWING NO. | MAP NO. | SHEET OF

EXHIBIT III