
Rawhide Wash Detention Basin Feasibility Study Phase II Funding Analysis

Prepared for

**Rawhide Wash
Regional Improvement Committee**
Arizona State Land Department
Home Builders Association of Central Arizona
City of Phoenix
City of Scottsdale

APRIL 1996

CHM HILL
RW Group, Inc.



April 29, 1996

Michael J. Phalen, Manager
Planning & Asset Management Section
Arizona State Land Department
1616 West Adams
Phoenix, Arizona 85007

Dear Mr. Phalen:

Subject: Final Report- Rawhide Wash Detention Basin Feasibility Study, Phase II
Funding Analysis

Pursuant to our conference call on April 2, 1996, with Jon Sorensen, the comments received from project sponsors and our responses have been added to the report. The comments add considerable value to the report and should therefore be reviewed carefully by the entire Rawhide Wash Regional Improvement Committee (Committee).

Several of the comments suggest different methods for implementing the recommended funding strategy and bring other new ideas and concerns to the table. These comments are noted, but the recommended funding strategy and supporting methods of implementation have not been revised, because the remaining project participants have not yet agreed to the changes in implementation. The Committee should review and discuss the comments concerning implementation, and other comments, and reach a consensus on how to proceed with implementation. We suggest that these discussions and Committee decisions be documented for the project decision record.

It is important to note the following statements in your February 22, 1996 letter to Steve Walker, CH2M HILL:

First, in a meeting held on January 17, 1996 at the offices of the Home Builders Association, the parties unanimously agreed to accept Cost Allocation - Method One, from your study, which allocates costs based upon the area removed from the FEMA AO Zone in each city. Based on this method, the costs of the Detention Basin project would be allocated 55.71 percent to the City of Phoenix and 44.29 percent to the City of Scottsdale.

The second issue, raised in the comments, is the cost of disposition of excavated materials from the Detention Basin. It is my understanding that estimating that cost is beyond the scope of your contract. The State Land Department agrees the cost must be determined to estimate the true cost of the basin. But, the State Land Department objects if it is to be used as a vehicle to continue debate over the relative merits of the Detention Basin proposal and the channelization option. If the latter is the issue, then in such a comparison, we must insist that the cost of disposing of excavation materials from the channels also be determined in order to reach a fair comparison. In this case, since we have been told expressly by Steve Hogan and Mark Landseidel at the City of Scottsdale, that the City now supports the Detention basin project and is no longer pursuing the channelization option, a cost comparison of disposing of excavation materials is not necessary. But we concur with the other parties, that it is a cost that eventually needs to be addressed.

A list of the comments received and the response to each comment is included as a new report section following this letter. For ease of reading, comments have been numbered and italicized, and responses follow immediately thereafter. The body of the *Phase II Funding Analysis* report is left intact.

Thank you for the opportunity to be of service on this project.

Sincerely,

CH2M HILL



Steven R. Walker, P.E.
Project Manager

phx/sww/111278/fundanal/ltr4_30.doc

Draft Report Comments and Responses

Flood Control District of Maricopa County

1. *Correct page 9 to reflect that the only IGAs which have been executed to date between the District and the City of Scottsdale are for the right-of way acquisition on the Reata Pass Channel and design costs of the Pima Road and Reata Pass Channels.*

Response: The correction is noted.

2. *Cost for disposition of excavated material should be included in the cost estimate.*

Response: Excess fill disposition costs have been added as an additional contingency to the overall cost estimate.

3. *Landscape costs stated as minimum seem disproportionately high (\$3 to \$4 million).*

Response: The landscape costs included are higher than the costs typically incurred by the District for a project of this nature and reflect the City of Scottsdale's landscape requirements. The cost assumptions used were negotiated and agreed to by the project participants during the Feasibility Study.

4. *The District is supportive of the regional Desert Green Belt Plan for North Phoenix and Scottsdale. Presently 50% funding for the Rawhide Wash, Pima Road, and Reata Pass elements of the plan are included in the proposed 5-year Capital Improvement Program. The program proposes to fund District participation beginning in the 96/97 fiscal year through the 00/01 fiscal year. The total district participation for the three elements is \$26.8 million based on available estimates.*

Response: This comment is generally consistent with the plan in the Draft Report, however, the specific funding available for the Rawhide Wash Detention Basin Project will require identification as an element of the overall Desert Green Belt funding.

5. *The District is prepared to negotiate an IGA with the Cities of Scottsdale and Phoenix or others, if appropriate, to implement the Rawhide Detention Basin project.*

Response: This comment is consistent with the plan in the Draft Report.

Arizona State Land Department

1. *We are in agreement that basin Alternative #3 is preferred, because the lower discharge (approximately 380 CFS) will have less downstream impact and result in lower channel costs. These alternatives were developed to assist in evaluating the feasibility of the project and will be further developed as part of the preliminary and final design process*

Response: No revision necessary.

2. *It is understood that the area in Phoenix removed from the AO Zone is 3,790.57 acres, 55.71% of the total acres involved (Table 2, page 10). This figure will change somewhat when the AO Zone boundaries and property lines are surveyed and engineered. It would be useful to break out acreage section by section and include acreage for the outer loop; Scottsdale Road may be totally in Scottsdale. This needs to be verified.*

Response: A listing of the property owners, acreage, and assessments will be issued as an addendum to this report.

3. *What is the length of the channel from Scottsdale Road to where it terminates at the apex? Is it less than 17,500 feet as shown in Table 3, page 11?*

Response: A check of our measurement shows that it is approximately 17,500 feet along the center of the AO Zone from Scottsdale Road to Jomax Road which is indicated as the Scottsdale City boundary per the December 3, 1993 FIRM. However, the proposed channel location shown on Figure 1 would result in a channel approximately 12,000 feet long within the City of Scottsdale. This channel length, and a revised length within Phoenix (17,000 feet) from Figure 1, result in a revised percentage of the channel in Phoenix of 59% and in Scottsdale of 41%.

4. *Would ADOT be a source of some funding, as the Rawhide Wash Detention Basin removes much of the Pima Freeway between 56th Street and Scottsdale Road from the AO Zone?*

Response: From a benefit-cost standpoint, it would be logical to include ADOT as a project sponsor, as well as other infrastructure owners. The benefit ADOT receives could be computed by several different methods. The first method includes assessing ADOT the same as private developers, or at the rate of approximately \$985 per acre. The second method includes determining the benefit to ADOT in reduced drainage construction costs with the detention basin in place.

5. *MCFCDD is the logical party to bear the O&M responsibilities. In the alternative, would the City of Scottsdale be responsible for maintenance of the basin (O&M: annual sediment removal and other maintenance tasks)?*

Response: Refer to Landmark comment and response 3A.

6. *The concept of Phoenix forwarding impact fees to the City of Scottsdale for construction of the basin is an attractive option, but SLD has concern of its legality.*

Response: The authors suggest a legal opinion to sort this out.

7. *Fees should be collected from owners of both developed and undeveloped lands to pay for construction of the basin since both will benefit from the basin.*

Response: The authors agree with this strategy and have included developed lands in the acreage to be assessed.

Arizona Department of Transportation by Stanley Consultants, Inc.

1. *The report states that the excavated materials will be wasted or sold. The intended purchaser could be ADOT. The timing of availability could be critical since it appears some difficult political agreements will need to be struck between the affected cities and various agencies in the Arizona State government.....*

Response: It is agreed that timing for disposal of the excess excavation material is critical. The unknowns with respect to the timing of the Rawhide Detention Basin construction and that of Pima Freeway and other projects that may need embankment material also makes it difficult to estimate the costs of excavated material. We have now included a contingency cost for disposing of this material that is our best professional judgment given the unknowns.

2. *Since earthwork is the largest single cost item, the excavation cost should be considered closely. The unit cost assigned to this item will most likely not cover the cost of haul and placement in roadway embankments. (The report indicates the unit cost has been viewed in this manner.)*

Response: Same response as for # 1 above.

3. *The downstream channel improvement costs seem low and do not appear to include the land acquisition for channels. Additional land and construction costs may need to be considered to bleed off water detained in the basin and to convey local runoff to the Bureau of Reclamation CAP Dike No. 2.*

Response: The authors concur with this comment, however, our scope of services stipulated we use other sources for the downstream channel cost estimate.

City of Scottsdale

1. *Our major concern with this report is the assumption that Scottsdale is willing to front the entire construction cost of the basin. This concept is not workable from either a fiscal or policy perspective. The Rawhide Wash project is extremely important to Scottsdale. However, our current priorities are the Reata Pass Wash and Pima Road Channel Desert Greenbelt projects. These are required to meet our commitments to ADOT to protect the Pima Freeway. Scottsdale's share of funding for the Rawhide Wash will be generated through an improvement district with some City contribution. The ultimate City contribution for this project is anticipated to be approximately \$700,000.*

Response: The author's chose Scottsdale for front-end financing because the City appeared to be in the best position of any of the project sponsors to provide such funding. If this is not the case, the project sponsors will need to identify a new source of front-end financing. Possibilities include the Arizona State Land Department, the developers, the City of Phoenix and/or a lending institution.

2. *The City of Scottsdale and Flood Control District of Maricopa County do not currently have an intergovernmental agreement for cost participation on the Rawhide Wash. FCD staff has not been supportive of Scottsdale's effort to establish a long-term IGA which would allow a guaranteed revenue stream for the Desert Greenbelt projects.*

Response: See comment #4 and #5 from the Flood Control District of Maricopa County.

3. *The committee must commit to active participation in Scottsdale's general plan amendment for the Rawhide Wash. This should be written into the commitments section of the report.*

Response: This should be discussed and resolved by the Committee.

4. *The project cost section must be presented in a much clearer manner. Rather than referencing the Feasibility Report, the project which is anticipated to be constructed should be well defined and a cost estimate included which only uses this preferred alternative. The preferred alternative should be stated clearly (our assumption was Alternative #3, with the smallest outflow possible) with the associated land area impacts. It appears that the report currently incorporates Alternative #2 with the land area of Alternative #4. A committee meeting with CH2M HILL should be held to insure that we all have a full understanding of the reports contents.*

Response: A revised and simplified cost summary has been attached. The preferred alternative is assumed to be Alternative #3. The feasibility study initially recommended Alternative #4, however following discussions with project participants, Alternative #3 was preferred due to its lower downstream discharges. For this funding assessment, the costs have been based on Alternative #2 due to its higher quantities of waste material and land requirements. This approach resulted in a higher cost and therefore more conservative discussion of the funding options.

It is important to note that the four alternatives were presented to allow a more complete assessment of the overall feasibility of the detention concept, not as final design recommendations. The important conclusion to be drawn from the comparison

of the alternatives and their concept level costs is that the range of the costs is relatively small.

The land area required for Alternative #2 is estimated at 150 acres, which would result in a land cost of \$2,793,600.

CH2M HILL will be glad to have a meeting to discuss the report.

5. *The cost to handle the excess excavated material must be part of the cost estimate. We have had several meetings to discuss the tremendous quantity of earth which must be exported from the general area. Finding a disposal site is going to be a major challenge.*

Response: As described previously, the costs were developed assuming that a demand for the excess material would eliminate any hauling or disposal costs. This assumption was made based on direction from the project participants. To account for the possibility that this assumption is not born out at the time of construction, the revised cost estimate includes a contingency for disposing of the excess material. The contingency assumes a 10-mile haul at \$5 per yard for 1,622,400 cubic yards for a total of \$8,320,000 (Alternative #2). Alternative #3 would have a disposal cost of about \$3,220,000. During the design phase of this project the demand for fill in the area must be reassessed as part of the final alternative consideration.

6. *A cost for engineering and administration to develop the final plans should be included in the cost estimate.*

Response: Costs for engineering, services during construction and administration have been added.

7. *On Page 11, the length of Scottsdale's Desert Greenbelt from the alluvial fan apex to Scottsdale Road is 10,500 feet (not 17,500 feet) as shown in the Greiner study plans.*

Response: Refer to the response to comment #3 for the Arizona State Land Department.

City of Phoenix

1. *The December 8, 1995, Funding Analysis has been reviewed by the appropriate City staff. Before going into specific comments, however, there appears to be a missing funding possibility from the alternatives that, from our perspective, is the most viable one of all. Specifically, allowing the State Land Department to pay at the time of sale. Because the value of the land is established based on improvements (existing or required), the positive value to the land, once the detention basin is installed, can be paid for at the time of sale by the State Land Department. This provides the project with the quickest cash flow (from the City of Phoenix's side); it goes right along with our (State Land Department and City of Phoenix) development plan; and it is by far the simplest from a bookkeeping perspective.*

Response: This is an idea that should be discussed and resolved by the entire Committee.

2. *Entering into an Intergovernmental Agreement (IGA) with Maricopa County Flood Control District for funding of 50% of the detention basin is not necessary. The City will continue to support the project as we have previously stated; entering into an IGA makes no sense at this point.*

Response: The City and the FCD should consider an IGA prior to the exchange of funds, the implementation of the project, or at another point in time when the City is counting on the implementation of the project to enable other projects to function properly.

3. *Entering into an IGA with the City of Scottsdale does not help the project because, as stated earlier, the logical funding mechanism for the Phoenix portion of the project (which we accept on a geographical basis of 55.71%) is the State Land Department's due to original seller and subsequent timing. The City, because of its ordinances, etc., is unwilling to amend them to allow collection of the "impact fees" at the recording of the plat (as suggested) versus collecting at house of building permit stage. Because of the lengthy delay between acquisition of land, platting of land, and purchasing building permits, it appears that the best solution is at acquisition. This would greatly improve the project's cash flow and the timing of moneys would be much more predictable. In summary, from a timing (cash flow) perspective, the best solution is for the State Land Department to factor the savings into the land value, collect it at the time of sale, and forward it to the project.*

Response: Phoenix and Scottsdale should consider an IGA prior to the implementation of the project, or at another point in time when Phoenix is counting on the implementation of the project to insure that other projects dependent on the lower discharges from the Rawhide Wash Basin function properly.

Landmark Land Company of Arizona, Inc.

1. *Landmark appreciates that you, as head of the ASLD Asset Management Section, are taking an active role in coordinating the ASLDs participation in defining the project and formulating a sound and equitable method of funding the Rawhide Wash Detention Basin (RWDB). Given the amount of State Trust land that will be removed from the AO Flood Zone if this regional flood control system is developed, the State Trust will be the greatest benefactor from the development of the RWBD; therefore, it is appropriate that the ASLD take an active role.*

Response: No response.

2. *Define the Project--The first step is to define the project (Landmark supports Alternative #3) and determine the following:*
 - A. *Time line*
 - B. *Total cost to complete*
 - C. *Construction management*
 - D. *Projected cost to maintain*
 - E. *Operational management*
 - F. *Phasing of costs (landscape, land payment, removal of excess material, etc.)*

Response: Determination of the above items is needed as part of the management of the project from this point forward.

3. *Funding Method--The second step is to determine the following:*
 - A. *The percentage of allocable, approved costs that the FCD will assume. In regard to the long-term management and maintenance of the facility, the County will collect secondary property taxes on developed and undeveloped property within the RWDB that are earmarked for flood control and which will exceed the cost to manage and maintain RWDB, there fore the FCD should assume the obligation to manage and maintain the RWDB after construction of the facility.*

Response: Refer to FCD policy and criteria for project funding, ranking and maintenance, FCD comments and Scottsdale comments. A suggestion by Steve Hogan in his interview for the December 1994 Draft Final Report was to form a Community Facility District to provide maintenance.

- B. *We concur with the concept that the approved costs over and above those costs assumed by FCD should be allocated Equitable to Scottsdale and Phoenix after consideration of all pertinent factors.*

Response: No response.

- C. *We agree that within each city that the city's allocated share of approved cost should be allocated equally on a per-acre basis to each acre of benefited land; land that is removed from the FEMA AO Flood Zone.*

Response: No response.

- D. *A determination should be made whether the allocated, approved costs are applied to both developed and undeveloped land benefited by removal from the FEMA AO Flood Zone. (Property on developed land would be relieved from flood insurance requirements.)*

Response: Developed and undeveloped property is included in the acreage to be assessed.

- E. *Determine a time certain to repay those entities that provide capital.*

Response: This will be negotiated and included in the terms of the agreement with the lending entity(s).

- F. *Determine whether or not ADOT would contribute freeway-construction savings resulting from the RWDB.*

Response: Refer to Arizona State Land Department Comment #4 above.

- G. *Determine whether or not Phoenix can contribute front-end capital. (The Phoenix Department of Economic Development should be consulted.)*

Response: The authors recommend pursuing all reasonable sources of front-end funding.

4. *The boundaries and all property within the boundaries of the Rawhide Wash and within FEMA's AO Flood Zone classification should be surveyed so as to account for all of the benefited acres on a section-by-section basis which will, in turn, determine the amount of benefited land within the City of Phoenix and the City of Scottsdale. The survey should also show lands in the FEMA AO Flood Zone that might be excluded, if any, from the benefited acre calculation (right-of-ways, freeway, permanent drainage ways, Chauncey property, Scottsdale Road, etc.)*

Response: A survey should be completed according to policy established by the Committee.

5. *Cost Estimates- We realize that the projected cost estimates from the Rawhide Wash Detention Basin are conservative estimates. In our opinion, they are overestimated by as much as 40%. In particular, the salvage, revegetation and landscaping are in excess of \$4.3 million of the total estimated cost; that is excessive. Projected land cost of approximately \$18,600 per acre, in our opinion, is overstated. Considering the location and constraints on the land being considered for the site of the Basin and the amount of the benefited Trust Land if the Basin is built, we believe that the land cost for the Detention Basin should be as low as possible. Excavation and removal of excess material expense is a concern of ours. Can the ASLD find a buyer for this material?*

Response: Refer to the response to FCD comment 3, to ADOT comment #1, to Scottsdale comment #4, and to Scottsdale comment #5.

6. *Long-Term Funding Commitments--The City of Phoenix and the City of Scottsdale need authority to:*

- D. *Form an IGA to enable them to assume long-term payment obligations.*
- E. *Authority to collect fees from all undeveloped property prior to the issuance of building permits or prior to initiating development of the property.*
- F. *ASLD should consider lease versus sale and favorable terms for the land.*

Response: Refer to Phoenix comments #1 and #3, and responses.

7. *Control of 100-year Outflows--The 100 year outflows released from the Basin should be minimized so as to minimize mitigating flood control construction and maintenance costs downstream from the Basin. The goal should be to keep the permitting requirements for downstream flood control to a minimum by keeping the aggregate of 100-year outflows and on-site runoff at acceptable levels.*

Response: These goals should be considered in the overall project context of initial project costs, maintenance costs, permitting costs, and the drainage policy and criteria of the cities of Phoenix and Scottsdale.

Mike, as you are aware, Landmark is in full support of the Rawhide Wash Detention Basin. The analysis needs refinement but is a big step in the right direction. We need to complete the analysis and be sure that all parties contribute their equitable share based on an acceptable definition of the project, costs to complete and a sound method of funding the project, with time-certain pay backs.

Grayhawk Development

1. *Our support of any financing alternative for the Rawhide Wash is predicated on three basic assumptions: First, at least 50% of the total funding should come from the FCD due to the regional benefit of the drainage improvement. Second, the remaining balance of the improvement cost should be allocated geographically to the downstream properties that would benefit from the improvement. Third, the total project cost to be allocated (including FCD Participation) shall not exceed \$14,000,000.*

Response: The first two assumptions are in line with the plan proposed in the Draft Report. The third assumption needs to be discussed and resolved with the Committee.

2. *We support the proposed methodology with the per acre assessment equal to the project cost (less FCD contribution) divided by the total number of acres within the flood hazard area. There are 595 acres within Grayhawk that are subject to the flood hazard area. With the proposed assessment per acre of \$985 , the Grayhawk assessment would be \$585,075.*

Response: No response.

3. *We support a financing alternative where private land owners pay their share upon final plat approval with one exception. No funds should become due until FEMA has given written approval for the improvements as a project that will eliminate the flood hazard zone.*

Response: Refer to Phoenix comment #1. With respect to FEMA approval, we suggest obtaining a Conditional Letter of Map Revision (CLOMR) prior to project construction. We also suggest reviewing the requirements and timing for all other required permits as part of the overall project management.

Jeff Minch

1. *Since earthwork is the largest single construction cost, the excavation unit cost should be verified. The decision to not consider costs associated with wasting excess fill material could significantly impact the feasibility of the project. Additionally, minor changes in the excavation unit cost could result in a different recommended alternative.*

Response: Refer to Scottsdale comments and responses #4 and #5.

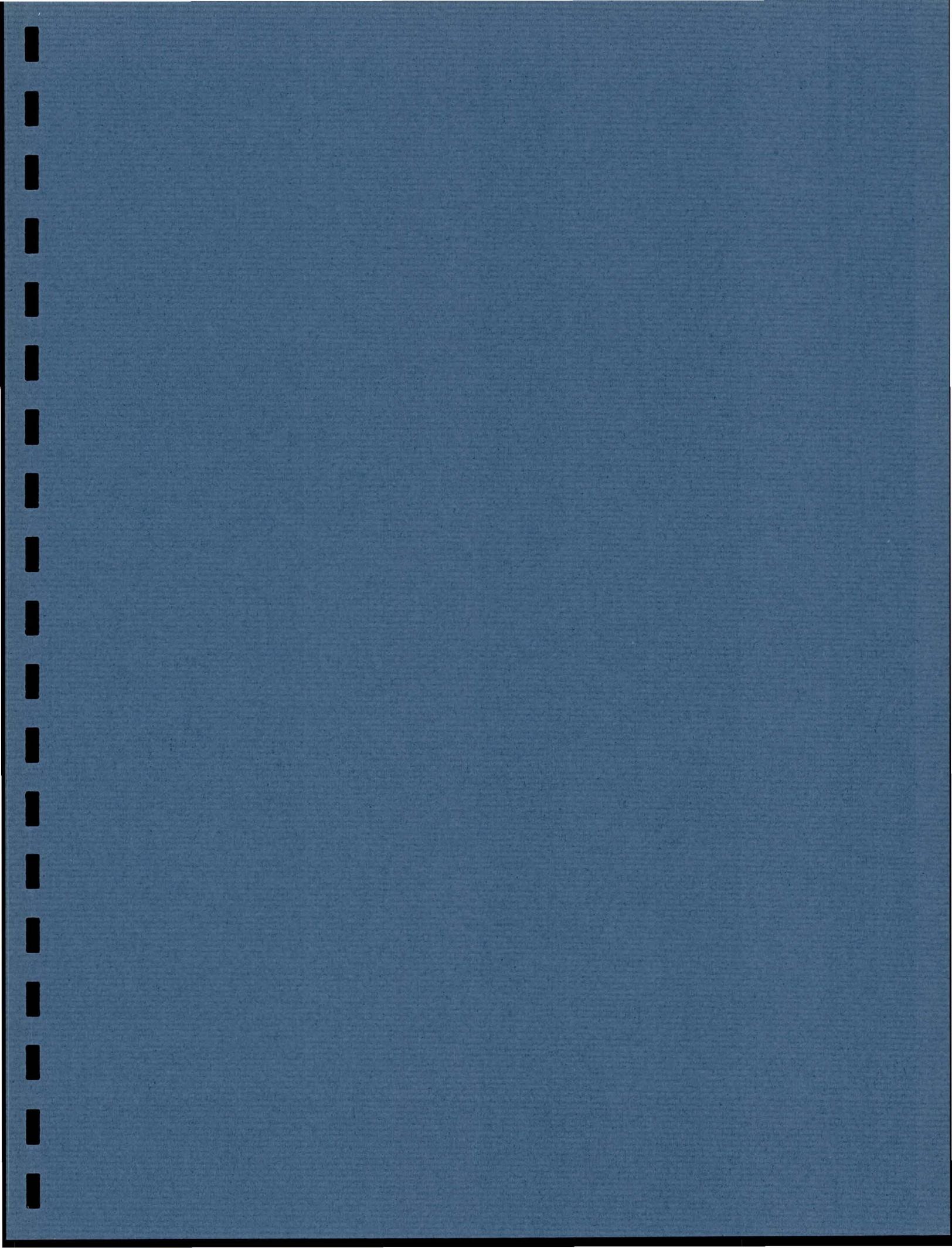
2. *The downstream channel improvement costs seem low and do not appear to include land costs. Additional land and construction costs may need to be considered to bleed off water detained in the basin and to convey local runoff to the BOR CAP Dike No. 2 (especially in Phoenix).*

Response: The authors agree with these comments.

3. *A number of legal issues and governmental agreements require closure prior to the design and construction of the proposed detention basin. Therefore, I would recommend ADOT design the Pima Freeway offsite drainage system assuming existing conditions.*

Response: The authors would like to see the Pima Freeway designed with and without the assumption of the Rawhide Detention Basin in place to determine the cost savings with it in place.

Estimate Summary		
Project: Rawhide Detention Basin, Feasibility Study		
Alternative #2 : Non-Avoidance Option		
#	Description	Total
A	Reservoir Construction	57.8 AC \$3,548,332
B.	Earth Dam Embankment Construction	33 FT \$962,100
C.	Spillway	200 FT \$900,000
D.	Downstream Improvements	\$50,000
E.	Site Development	\$3,055,000
SUBTOTAL Basin and Embankment Construction Cost		\$8,520,000
MARK-UPS:		
	Overhead and Profit	5% \$430,000
	Mobilization, Bonds and Insurance	4% \$360,000
	Contingency	20% \$1,860,000
	Escalation @ 3% per year - one year	3% \$340,000
TOTAL Basin and Embankment Construction Cost		\$11,510,000
Additional Contingencies		
	Waste Fill Disposal	1,664,000 cy@ \$5.00/cy \$8,320,000
	Engineering, SDC, Permitting and Administration	15% \$1,726,500
TOTAL with all contingencies		\$21,556,500



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Executive Summary

Introduction

The recommended funding option for land acquisition and construction of the proposed Rawhide Wash Detention Basin calls for 50 percent funding from the Flood Control District of Maricopa County (FCDMC) and the balance of the funding from land developers in the City of Scottsdale and the City of Phoenix. Because the FCDMC funding will not be available for 10 to 15 years and private land developer money will be generated throughout a similar time frame, it is proposed to have the City of Scottsdale provide front-end financing for construction (\$11,500,000) and the Arizona State Land Department (ASLD) provide front-end financing for the land (\$1,909,000). The City of Scottsdale would be repaid as land developers in Phoenix and Scottsdale develop land which would include assessments on areas located in the Federal Emergency Management Agency (FEMA) "AO" flood zone. Scottsdale would also receive their share of the FCDMC funds when available. The ASLD would be repaid for the land from the FCDMC funds.

The per acre assessments on AO zone land would be approximately \$985 in Scottsdale and in Phoenix.

Several issues involving the project cost are still outstanding. One issue is the excess excavation material that may or may not cost money to have removed from the site, depending on market conditions. The cost estimate in this report does not include a cost for disposing of the material offsite.

A second issue is the cost of the ASLD land where the detention basin would be located. The cost assumed in this report is \$18,624 per acre for 102.5 acres which equals a total cost of \$1,909,000. This cost appears high for floodplain land based on the experience of the authors, however, the ultimate cost will be determined by an appraiser.

Arizona State Land Department Commitment

A lease purchase agreement would be developed for the acquisition of the detention basin site by both the City of Phoenix and the City of Scottsdale under an IGA. The lease/purchase agreement would provide payments to the ASLD from funds budgeted for the project by the MCFCD. The lease/purchase agreement would require a balloon payment at the end of the 10- to 15-year lease/purchase when MCFCD funding becomes available.

The ASLD will receive the full return for the sale of the parcel required for the Detention Basin site as required by State Statutes. The Cities will not have to raise the funding required for site acquisition up front to construct the project.

City of Scottsdale Commitment

The City of Scottsdale would provide front-end funding for the construction of the detention basin and apply for the transfer of the funding commitment from the Desert Greenbelt project by the MCFCD to the Detention Basin project. In addition, Scottsdale will have to enter into an IGA with the City of Phoenix for long-term repayment from development impact fees in Phoenix.

The total cost to the City of Scottsdale is approximately the same as or less than the funding required to do the Desert Greenbelt Rawhide Wash. With the offset of development impact fees from the City of Phoenix, the net cost to the City and ultimately its property owners is half of what the costs would be for their project alone.

City of Phoenix Commitment

The City of Phoenix would enter into an IGA for the purchase of the detention site utilizing the MCFCD funding commitment. In addition, the City of Phoenix will have to enter into an IGA with the City of Scottsdale committing to forward any payments received for development impact fees for the project area to the City of Scottsdale. A provision needs to be developed which requires payment of the development impact fee upon recording of any plat in the subject area. All development fees for the area will be forwarded to the City of Scottsdale upon payment.

The City of Phoenix will not have to come up with any funding to initiate construction of the project.

Private Developers' Commitments

The developers would have to pay the development impact fee upon approval of each plat instead of when pulling a building permit.

The ultimate savings for private developers will be a large portion of the costs for flood channels which would have to be incorporated into their development costs. The sites would be released from development requirements for grading in the AO Zone and would incur less infrastructure cost when developing. The sites would be more marketable due to being released from the AO Zone.

Flood Control District of Maricopa County (FCDMC) Commitment

The FCDMC needs to support establishment of the authority to enter into long term funding commitments. In addition, the FCDMC needs to support transfer of their commitment for the Desert Greenbelt to the Rawhide Wash Detention Basin project.

Recommended Financing Plan Concept

The Rawhide Wash study area contains approximately 11 square miles which are within the FEMA "AO" designated flood hazard zone. The project area lies within both the City of Phoenix and the City of Scottsdale jurisdictions. A small portion on the City of Phoenix side of Scottsdale Road remains under Maricopa County jurisdiction. The area affected by the proposed project is shown on Figure 1.

The recommended solution for protecting all property located within the Rawhide Wash project boundaries from flooding requires an estimated capital expenditure of \$1,909,00 for land acquisition and \$11,500,000 for the construction of a large detention basin facility on property owned by the ASLD north of Jomax Road, between Scottsdale Road and Pima Road (Figure 1). The total project costs could potentially be shared by the City of Phoenix, the City of Scottsdale, the FCDMC and private property owners in the project area.

To facilitate completion of all Rawhide Wash Detention Basin drainage improvements within a 10-year schedule (1996-2006), which is the objective of the financing plan, requires the formation of one or more special taxing districts with authority to issue debt instruments secured by assessable land within the district's boundaries. These special districts could be in the form of Municipal Improvement Districts or Community Facilities Districts.

Security for the debt created by a special district can be achieved through assessments on the private property within the district boundary and through IGAs between the FCDMC, the City of Phoenix, and the City of Scottsdale. In addition, the City of Phoenix, the City of Scottsdale, the ASLD, and the property owners may participate with cash contributions to the taxing district from the sale of general obligation bonds or other funding sources.

Private property owners with undeveloped property have the option of allowing their property to be assessed over a 10-year period, or make a cash contribution equal to the total project costs allocated to their property. The City of Phoenix, City of Scottsdale, or ASLD can pay the assessment against any existing developed residential property. Contributions from the FCDMC must be secured through an IGA between the FCDMC, the City of Phoenix, and the City of Scottsdale. The IGA must provide for contributions of at least 50 percent of project costs (\$6,704,500 plus interest) equal to the debt service requirements on the total FCDMC contribution. To establish statutory authority for a 10-year IGA, it is our understanding that an addition to Arizona Revised Statutes 11-952 is required, which allows public agencies to enter into long-term payment obligations (We suggest a legal opinion to confirm our understanding).

Equitable allocation of project costs to all lands lying within the FEMA "AO" zone is imperative. To achieve this objective, the City of Phoenix and the City of Scottsdale need authority to collect fees from all undeveloped property prior to initiation of development on the property. A Drainage Facilities Development Fee ordinance must be adopted granting

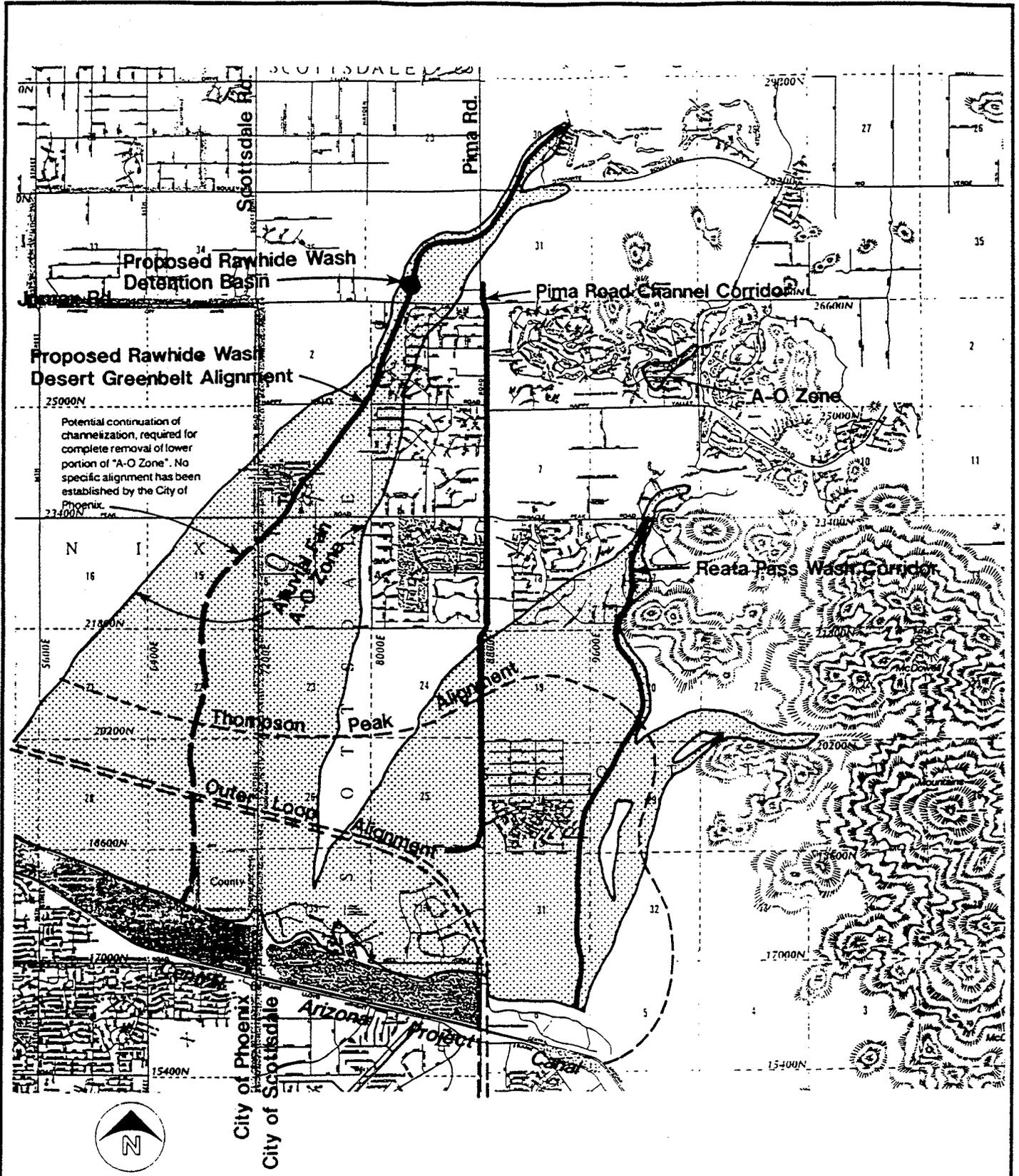


Figure 1
General Location Map



authority for each City to require payment of all drainage fees assessed, on a per acre basis, prior to the issuance of a building permit or other authority to initiate development of the property.

Alternative sources and types of funding are included in Appendix 1.

Project Cost Review

Project cost estimates have been developed for four conceptual cost alternatives. The basis for the estimates is outlined in a CH2M HILL memorandum dated December 8, 1994 and revised in CH2M HILL memorandum dated March 1, 1995 (Appendix 2).

Cost estimate summaries for each of the following proposed alternatives are included in Appendix 2. Each alternative listed does not include a spillway option, the spillway is added later.

Alternative No.	Alternative Title
------------------------	--------------------------

- | | |
|----|--|
| 1. | Avoidance Option (Not including spillway option) |
|----|--|

For this alternative, the basin embankment avoids affecting the archaeological sites documented by ASLD. The spillway height is limited to 24 feet with a maximum embankment height of 33 feet. The basin area at the spillway crest is about 57 acres with a total area of disturbance of about 78 acres

- | | |
|----|--|
| 2. | Non-Avoidance Option (Not including spillway option) |
|----|--|

For this alternative, the basin embankment will bury the archaeological sites located in the southwest portion of the site. Treatment of the archaeological sites will be required prior to implementation of Alternative No. 2. Alternative No. 2 results in a slightly smaller area of disturbance than Alternative No 1. Other basin characteristics are essentially identical to Alternative No 1.

- | | |
|----|--|
| 3. | Zoned Basin Option (Not including spillway option) |
|----|--|

For this alternative, the bottom elevation of the detention basin is terraced to focus water storage from the more frequent floods in localized zones of the basin. The terraced areas will allow more permanent landscaping to be used in the higher elevation portions of the basin bottom. The basin embankment alignment for Alternative No. 3 will be nearly identical to Alternative No 2, although terracing will require a larger basin (approximately 63 acres) and total disturbance area (approximately 84 acres).

4. Minimum Grading (Not including spillway option)

Alternative No. 1, 2, and 3 result in significant volumes of excavation which must be wasted onsite or hauled offsite. Alternative No. 4 has more balanced earthwork volumes, with the excavated volume substantially reduced compared to Alternative No. 1 to No. 3. A complete earthwork balance is not possible without substantially increasing the basin size and/or the embankment height. To minimize the excavation, the spillway height was raised to 29 feet, the maximum embankment height to 37 feet, and the low flow outlet capacity was increased to about 920 cubic feet per second. To compensate for the reduced spillway head, the spillway was lengthened to 700 feet. The increased spillway and embankment height will not significantly affect views from adjacent parcels. The total ponding area for Alternative No. 4 was reduced to about 45 acres with a total disturbance area of about 50 acres.

The total construction costs for each of the above listed alternatives are shown in Table 1. The construction costs used in this study will be for Alternative No. 2 (\$11,500,000). This cost includes the \$10,560,000 from the detailed estimate summary rounded to \$10,600,000, plus \$900,000 for the spillway. The total project costs include construction costs of \$11,500,000 plus land acquisition costs of \$11,909,000 for a total cost of \$13,409,000 used for this study.

Excavation

The Rawhide Wash Detention Basin Feasibility Study recommended that no costs be included for removal of excess earthfill. It further stipulates that the excess fill will be stored onsite and sold to developers upon request. However, the City of Scottsdale was recently projected a significant quantity of excess fill being available on many jobs in the immediate vicinity of the Detention Basin project. This could result in an increased cost for the Detention Basin project (1,705,400 C.Y. at \$1.00/C.Y. = \$1,705,400). This cost could increase significantly if the cost for disposal is higher than the \$1.00/C.Y. projected. We therefore suggest considering a contingency cost for disposal of the extra fill.

Land Costs

The cost for land acquisition is projected at \$15,000 per acre for 102.5 acres for a total of \$1,538,000 plus a 20 percent contingency of \$309,000. This land acquisition cost of \$1,853,000 was escalated at 3 percent for 1 year (\$56,000) bringing the total land acquisition cost used for the report to \$1,909,000 (\$18,624 per acre). The unit price of \$18,624 per acre may be significantly different from the actual costs for acquisition. The Desert Greenbelt

project used \$25,000 per acre for projecting land acquisition costs. If the \$25,000 per acre costs were used it would result in a land acquisition cost of \$3,182,000. This increased land costs could affect the conclusions when comparing the City of Scottsdale Desert Greenbelt Rawhide Wash alternative to the Rawhide Wash Detention Basin. This report uses the \$1,909,000 for analysis and recommendation, but should be modified if the cost per acre for the site acquisition is determined to be different from the \$18,624 used.

While average land costs in the Rawhide Wash floodplain appear to be in the \$15,000 to \$25,000 per acre range (based on other studies), the cost per acre where the detention facility is proposed may be less. Land costs in this area would be lower because of the narrower than average floodplain. The narrower floodplain results in higher depths and/or velocities, and therefore greater expenses in floodplain mitigation to allow for land development. It is possible that a developer would have to invest significantly in flood control improvements which would decrease the market value of the land to less than \$15,000 per acre.

In summary, it is difficult to project land acquisition costs because they are dependent on market conditions and on the value of the land to a developer who would be required to invest significantly in flood control improvements. We therefore believe that the \$18,624 per acre estimate is prudent until an appraisal is completed.

Alternative Cost Allocation Strategies

FCDMC Cost Participation Assumption

The City of Scottsdale has negotiated an agreement for participation by the FCDMC for 50 percent of the Desert Greenbelt project which includes the Rawhide Wash Channel. This FCDMC participation for the Rawhide Wash Channel portion of the Desert Greenbelt is estimated at \$6,616,993. This compares closely to the 50 percent of the proposed cost for the land acquisition and construction of the Rawhide Wash Detention Basin estimated at \$6,704,500. Therefore, FCDMC participation would be equivalent for either the Channelization or the Detention Basin options if 50 percent funding is also requested for the Rawhide Wash Detention Basin.

The difficulty incurred with any funding from the FCDMC is that it can only be committed on a one-year fiscal basis. Unless an alternative source of funding is made available by either City or other parties to the project, it is impossible to proceed until the funding required has accumulated in the FCDMC Capital Improvement Program.

Authority for the FCDMC to enter into long-term IGAs has been investigated. Statutory authority for a long-term agreement (5 to 10 years) is possible with revisions to Arizona Revised Statutes 11-952. With this statutory authority, an IGA could be entered into between FCDMC, the City of Phoenix, and City of Scottsdale which could provide annual contributions to the project equal to the FCDMC debt service requirement plus interest.

The project costs allocation for the remainder of this report will be based on the assumption that a vehicle will be provided to allow the FCDMC to participate for 50 percent of the land acquisition and construction costs for the Rawhide Wash Detention Basin Option. The remaining costs to be financed locally are therefore 50 percent as well, or \$6,704,500.

Local Jurisdiction Cost Allocation

There are several equitable methods for allocating the 50 percent local share of project costs between Phoenix and Scottsdale. Three methods are discussed below.

The first method of proportioning the costs between the two cities is based upon area within the FEMA AO Zone removed as a result of the proposed detention basin project. The second method is based on the length and discharges of alternate channels to contain the floodplain. A third method for proportioning the costs is based upon the cost avoidance each city achieves. The three methods are summarized below.

Method One—AO Zone Area. Table 2 shows the project cost allocations between the two cities based on areas removed from the FEMA AO Zone.

Table 2 Project Cost Allocation Based on Area Removed from FEMA AO Zone		
City	Area Removed from AO Zone	Project Cost Allocation
Phoenix	3,790.57 acres	55.71%
Scottsdale	3,013.14 acres	44.29%
Total	6,803.71 acres	100.00%

This method assumes that all AO land receives equivalent benefit which is a viable way to allocate costs. This method of distributing the costs for the Detention Basin Project results in a cost allocation of 55.71 percent for Phoenix land and 44.29 percent for Scottsdale land. The acreage used in this method for the City of Phoenix AO Zone was determined from the Flood Insurance Rate Map (FIRM) Panel 1230, 1234, 1240, and 1245 dated December 3, 1993. This acreage does not include the acreage just north of the Central Arizona Project indicated on the maps as Zone A. The acreage for the City of Scottsdale was taken from the Desert Greenbelt Report prepared by Greiner Engineering.

Method Two—Alternative Channel Lengths. Method Two is based on the size (discharge capacity) and length of channels necessary to contain the floodplain. Assuming that the channel size (and discharge) would be the same in both jurisdictions, Table 3 shows the approximate lengths of channels **at the center of the AO Zone** within each jurisdiction.

Table 3 Project Cost Allocation Based on Channel Length		
City	Channel Length	Project Cost Allocation
Phoenix	15,500 feet	47%
Scottsdale	17,500 feet	53%
Total	33,000 feet	100%

This method is also considered equitable, because the cost of conveyance is proportional to benefit received. However, channel slope is another factor that influences channel cost. If slopes are steeper in Scottsdale for, example, this would place a higher percentage of the costs on the Scottsdale side. Additional costs can also enter into this method, but it is apparent from a cursory analysis that the cost allocation for this method is in the same range as Method One.

Method Three—Alternate Channel Costs Estimates. Method Three allocates costs based on alternate project cost avoidance. In other words, what would it cost to build flood channels to allow development in the City of Phoenix and Scottsdale without the Rawhide Wash Detention Basin. Table 4 presents the allocation of project costs based on this method.

Table 4 Project Cost Allocation Based on Cost Avoidance		
City	Alternative Project Cost	Project Cost Allocation
Phoenix	\$53,666,000	79.71%
Scottsdale	\$13,657,000	20.29%
Total	\$67,323,000	100.00%

This method of distributing the costs for the Detention Basin Project results in 79.71 percent for Phoenix and 20.29 percent for Scottsdale. The ultimate developer would be spared the costs for channelization and its related improvements if the Detention Basin project is constructed resulting in significant reduction in total development costs. Before this method of distributing the costs for the Detention Basin could be used, a complete preliminary design would have to be completed using similar design parameters and assumptions. Since it is beyond the project scope to complete such an analysis and since the numbers result in a significantly higher percentage than Method One and Two, it is not recommended that this method be used.

The costs for this method are based on the estimates in Appendix 3 to construct full channelization in both the City of Phoenix and the City of Scottsdale. The sheets include estimate summaries titled: *Additional Detention Basin Costs (Phoenix Channelization)* and *Additional Detention Basin Costs (Scottsdale Channelization)*. The summary sheet is titled: *Rawhide Wash Detention Basin and Green Belt-Conceptual Cost Alternatives*.

The costs shown in the table titled: *Rawhide Wash Detention Basin and Greenbelt Conceptual Alternatives* for Channelization in Phoenix and Scottsdale were furnished by the ASLD Drainage and Engineering Section. The costs determined for channelization in the City of Scottsdale (\$13,657,000) seems appropriate when comparing to the estimate included in the City of Scottsdale's Desert Greenbelt Report (\$14,420,738.15). No detail was furnished for the costs determined for channelization in the City of Phoenix (\$53,666,000). The City of Phoenix channelization costs would require additional analysis to determine if they were based on similar assumptions and design parameters when compared to the work projected to be completed in the City of Scottsdale. The Phoenix channel is more complicated in that it splits into multiple channels thus requiring a full drainage analysis to determine the total project costs.

Additional Local Jurisdiction Cost Allocation Methods

Current Valuation Method. The properties included in the AO Zone in the City of Phoenix and the City of Scottsdale are directly east and west of Scottsdale Road and are within 2-1/2 miles of the jurisdictional boundary (Scottsdale Road). The type of developments projected within each jurisdiction are similar in zoning use and densities. This should result

in similar valuations when placed on the tax roles. If this assumption is true, the result in split of costs for the Detention Basin project would be the same as the acreage method. There is some speculation that the value of developments in Scottsdale will be higher than the City of Phoenix side due to name recognition with Scottsdale which may drive land values higher. If this would result, the valuation method would swing to a higher percentage in Scottsdale.

Future Valuation Method. This method would be very difficult to use due to the valuations being tied to the actual type of developments constructed. There is always a great deal of debate associated with the zoning of any property as to the ultimate density allowed. Without the resolution of all zoning issues in each city, the future valuation is subject to a great deal of variation which when translated into value could swing the ratio back and forth between each city.

Fair Market Value Increase Method. The market value for the properties within the AO Zone will be significantly increased when removed. The property will be freed from restrictions that the AO Zone places for elevation requirements which then control the design parameters for any development. This removal from elevation requirements should result in lower infrastructure costs which then makes the property more marketable and more developable. These two factors should result in a greater market value. Since the major property lying in the AO Zone in both the City of Phoenix and the City of Scottsdale is controlled by the ASLD, this increased marketability could lead to earlier sale of trust lands.

Recommendation

The most equitable method presented is Method One AO Zone area. The method is recommended because it is directly tied to the land receiving benefit by removal from the AO Zone. This method is more closely aligned with traditional methods of assessing drainage improvement in improvement districts by tying the benefits directly to the acres benefiting. The method has the advantage of not depending on complex design and cost calculations and assumptions. A straight forward method like Method One is usually best because it is easy to explain to people that will be buying into it.

FEMA Compliance/Insurance Equity Fee

Properties within the Rawhide Wash Channel FEMA AO Zone are required to construct building pads to specific elevations and are impacted by either Federal Flood Insurance or normal insurance premiums.

The assessment calculations for the Rawhide Wash Detention Basin can include an insurance equity fee based on the benefit derived in foregoing flood insurance costs. All residential properties in the AO Zone for the Rawhide Wash Channel are required to carry Federal Flood Insurance. All non residential properties are impacted by insurance premium if development occurs within an AO Zone.

The amount of assessment can vary widely from as low as no assessment up to the savings received by the property owners for 10 years. The 10 years is derived from the normal period for redemption of the bonds issued for construction of the improvements. The amount to assess is recommended to equal 1 year's insurance expense. The actual insurance rate savings will vary significantly since the flood insurance rate table takes into consideration many individual features on each dwelling. The average annual rate paid for single family residential properties is approximately \$360. It is recommended that the \$360/dwelling unit with an average density of 2.50 dwellings per acre be used. The rate of savings for industrial and commercial properties be estimated at a minimum of \$900/ acre which is the same as residential property.

This assessment for insurance equity fee is easy to explain and is well within the benefit that each property owner derives from the proposed project. The balance of the project costs can be assessed as drainage improvements.

**Cost Allocations for Scottsdale and Phoenix
Land Owners/Developers
Assuming 50% Funding by FCDMC**

City of Scottsdale Participation

Total Construction Costs	\$11,500,000.00
Land Acquisition	\$ 1,909,000.00
Total Project Costs	\$13,409,000.00
50% FCDMC Participation	\$ 6,704,500.00
Total Assessable	\$ 6,704,500.00
Scottsdale Participation (44.29 percent)	\$ 2,969,423.00
Insurance Equity Fee (3,013.14 acres at \$900/Acre)	\$ 2,711,826.00
Drainage Assessment (With Insurance Fee)	\$ 257,597.00
Costs per Acre (Assessable acres = 3,013.14 acres)	\$ 85.49
Drainage Assessment (Without Insurance Fee)	\$ 2,969,423.00
Costs per Acre (Assessable acres = 3,013.14 acres)	\$ 985.49
City of Scottsdale Property (41.59 acres)	\$ 40,986.58
State Land (694.97 acres)	\$ 684,885.98
Developed Lots (2 percent of Res. acres 2,653.14)	\$ 52,292.86
Total City Participation	\$ 778,165.42
Property Owner Assessment	\$ 2,191,257.58

The City of Scottsdale has Bond authorization from the voters which could provide the required funding for their participation in this project. The current estimated participation for the Desert Greenbelt Rawhide Wash Channel for the City of Scottsdale is \$2,391,127.67. The current Maricopa County Flood Control participation is estimated for the Desert Greenbelt Rawhide Wash Channel is \$6,616,993.00. An improvement district could be formed for the assessment of costs to the benefiting property owners. **The costs per acre would total \$985.49** and could be justified either as an insurance equity fee in part or total with the balance assessed as a drainage fee or the total costs assessed as a drainage fee.

The project calls for the City of Scottsdale to advance the funds necessary to cover the assessments on State and Federal lands (\$684,885.98). With the adoption of a Drainage Impact Ordinance by the City, the funds advanced could be partially or totally recovered. The Ordinance would need to specify definition of benefiting regions, offset of fees or assessments already paid by the property, and procedures for payment or assumption of any assessments.

**Cost Allocations for Scottsdale and Phoenix
Land Owners/Developers
Assuming 50% Funding by FCDMC**

City of Phoenix Participation

Total Construction Costs	\$11,500,000.00
Land Acquisition	\$ 1,909,000.00
Total Project Costs	\$13,409,000.00
50% FCDMC Participation	\$ 6,704,500.00
Total Assessable	\$ 6,704,500.00
Phoenix Participation (55.71 percent)	\$ 3,735,077.00
Insurance Equity Fee (3,790.57 acres at \$900/Acre)	\$ 3,411,513.00
Drainage Assessment (With Insurance Fee)	\$ 323,564.00
Costs per Acre (Assessable acres = 3,790.57 acres)	\$ 85.36
Drainage Assessment (Without Insurance Fee)	\$ 3,735,077.00
Costs per Acre (Assessable acres = 3,790.57 acres)	\$ 985.36
Bureau of Reclamation (1.00 acres)	\$ 985.36
Central Arizona Project (.49 acres)	\$ 482.83
State Land (3,628.85 acres)	\$ 3,575,724.62
Total Government Lands	\$ 3,577,192.81
Property Owner Assessment	\$ 157,884.19

The City of Phoenix normally funds flood control projects through Local Improvement Districts (LIDs) and does not have budgeted City funds available for projects of this nature. Since the majority of the acres on the City of Phoenix side of the project are under the control of the ASLD, a method for raising funding is required. State Lands can be assessed within an improvement district under certain conditions but cannot be collected on while the land remains under State control. The party purchasing the property may assume the balance due on the assessment but cannot be held liable for any amount due prior to the sale of the land.

The project will require a party (ASLD, City of Phoenix, City of Scottsdale, Private Developers, etc.) to advance the funds required (\$2,146,329.62). With the adoption of a Drainage Impact Ordinance by the City, the funds advanced could be partially or totally recovered. The Ordinance would need to specify definition of benefiting regions, offset of fees or assessments already paid by the property, and procedures for payment or assumption of any assessments.

**Cost Allocations for Scottsdale and Phoenix
Assuming 70% Funding by FCDMC**

City of Scottsdale Participation

Total Construction Costs	\$11,500,000.00
Land Acquisition	\$ 1,909,000.00
Total Project Costs	\$13,409,000.00
70% FCDMC Participation	\$ 9,386,300.00
Total Assessable	\$ 4,022,700.00
Scottsdale Participation (44.29 percent)	\$ 1,781,653.83
Insurance Equity Fee (3,013.14 acres at \$900/Acre)	\$ 2,711,826.00
Drainage Assessment (With Insurance Fee)	\$ 0.00
Costs per Acre (Assessable acres = 3,013.14 acres)	\$ 0.00
Drainage Assessment (Without Insurance Fee)	\$ 1,781,653.83
Costs per Acre (Assessable acres = 3,013.14 acres)	\$ 591.29
City of Scottsdale Property (41.59 acres)	\$ 24,591.95
State Land (694.97 acres)	\$ 410,928.81
Developed Lots (2 percent of Res. acres 2,653.14)	\$ 31,375.50
Total City Participation	\$ 466,896.26
Property Owner Assessment	\$ 1,314,757.57

**Cost Allocations for Scottsdale and Phoenix
Land Owners/Developers
Assuming 50% Funding by FCDMC**

City of Phoenix Participation

Total Construction Costs	\$11,500,000.00
Land Acquisition	\$ 1,909,000.00
Total Project Costs	\$13,409,000.00
70% FCDMC Participation	\$ 9,386,300.00
Total Assessable	\$ 4,022,700.00
Phoenix Participation (55.71 percent)	\$ 2,241,046.17
Insurance Equity Fee (3,790.57 acres at \$900/Acre)	\$ 3,411,513.00
Drainage Assessment (With Insurance Fee)	\$ 0.00
Costs per Acre (Assessable acres = 3,790.57 acres)	\$ 0.00
Drainage Assessment (Without Insurance Fee)	\$ 2,241,046.17
Costs per Acre (Assessable acres = 3,790.57 acres)	\$ 591.22
Bureau of Reclamation (1.00 acres)	\$ 591.22
Central Arizona Project (.49 acres)	\$ 289.70
State Land (3,628.85 acres)	\$ 2,145,448.70
Total Government Lands	\$ 2,146,329.62
Property Owner Assessment	\$ 94,716.55

Appendix 1.
Possible Sources and Types of Funding

Appendix 1

Possible Sources and Types of Funding

The primary sources of funding for the Rawhide Wash Detention Basin identified in the interviews include the City of Scottsdale, the City of Phoenix, private landowners, possible private sources, and the FCDMC. Secondary sources of project funds may include the Heritage Fund, the Historic Preservation Fund, and the Land and Water Conservation Fund. Representatives of these secondary funding organizations have not been interviewed. In addition, owners of existing developments and infrastructure not listed above should be considered for funding based on the benefits they would receive from the project. Such benefits may include protection of roads and underground or overhead utilities from flood flows, flood scour, and sediment deposition.

Cash Contributions

Potential cash contributions from the primary funding sources such as the City of Scottsdale, the City of Phoenix, the FCDMC, and landowners are outlined below.

City of Scottsdale

The City of Scottsdale may have bond money available for its share of the project, if:

1. It selects the project in place of the flood control elements of the Desert Greenbelt alternative for Rawhide Wash,
2. The City determines that this project has a high enough priority compared to other potential bond projects, and
3. Equity is achieved with other project beneficiaries.

The bond money could be used to purchase land rights, complete studies and designs, construct and maintain the project.

City of Phoenix

The City of Phoenix normally funds flood control projects through its Capital Improvement Program, bond programs, or Local Improvement Districts (LIDs). It does not, currently, or in the foreseeable future, have budgeted City funds available for projects of this nature. However, the City is not reevaluating development impact fees in the area which may offer a potential source of funds for the project.

FCDMC

The FCDMC has placed the City of Scottsdale's Desert Greenbelt Project on its list of Capital Improvement Projects to receive matching funds. If Scottsdale replaces the flood control elements of the Greenbelt Project with the Rawhide Wash Detection Basin Option, the FCDMC will prioritize the detention option according to FCDMC criteria (Appendix B) and place it on its list of approved projects. It is more likely to be approved because of its regional benefits. FCDMC funds can be used for project design, construction, and purchase of land rights. According to FCDMC Board of Directors Resolution FCD 93-02 "For projects providing mitigation of future flood damage potential, the agreements shall stipulate that district contributions toward land acquisition, construction and operations and maintenance be repaid or otherwise credited to the District. Such repayment or credit is to be based on predetermined schedules that are not tied to the rate of future development." This direction makes assessment of benefits and essential factor in any future funding provided by the District.

Private Landowners

Landowners typically make cash contributions through LIDs or similar districts. The LID approach is a viable alternative for the private land owner beneficiaries of the project, but is more complex for the Arizona State Land Department. ASLD can agree to be included in an LID or in impact fee agreements, but cannot pay district assessments (the local jurisdiction would have to pay the assessment). When ASLD sells their land, the new private owner could be bound by the agreement, and would have to pay the district assessment for the years the private owner owns the land (the private landowner could not be required to pay the assessment for years they did not own the land). A possible strategy to work within this limitation is to have the local jurisdiction or another organization pay the assessments and later recoup the money from the eventual private landowner or another source. Impact fees may also be a possibility for ASLD land. If the impact fee agreement meets certain ASLD requirements, the impact fee could be assessed on the purchaser of the ASLD land, but not on the ASLD.

Private Funding Sources

The possibility of a private or private/public partnership (alternative project delivery) funding mechanism warrants further investigation. These types of arrangements that could be implemented for this project include total turn-key projects, design-build, privatized ownership and operation, and various program management/design/construction mechanisms. Typical combinations include:

- Program Management - Procurement of all project services required, with or without financing.

- Design-Build only, with or without financing
- Public involvement, permitting, studies, design - then contractors public bid
- Financing only
- Other combinations may be optimal depending on project timing, and participant needs.

This project may benefit from one of the alternatives above because of the multiple participants, financing needs, and immediacy. Private program management/funding of the project could expedite it significantly because of the ability of the private organization to focus on project issues and facilitate the equitable involvement of all participants.

The availability and degree of private involvement is somewhat market driven. A procurement process that solicited bids/letters of interest would help define what is available for this project.

Non-Cash Contributions

Cities

The cities of Phoenix and Scottsdale may be able to provide non-cash contributions in the form of zoning and/or density trade-offs, if certain conditions are met. The cities also may consider alternative locations of developer required infrastructure such as roads, under certain conditions, and other non-cash contributions.

Landowners

Private landowners may have the ability to provide the construction of public infrastructure not normally required and to provide land and/or certain land rights either outright or in trades. For example, a private developer may be able to trade land needed for the construction of a public facility in return for more developable land out of a flood zone.

The ASLD is somewhat limited in what it can do in non-cash contributions. The ASLD cannot make land trades or exchanges, they must sell land for fair market value. The ASLD does have the ability to develop and install infrastructure through infrastructure contracts. A density transfer may be possible on land owned by the ASLD, but any transfer would be difficult and would have to be considered carefully because of the effects on the 14 different beneficiaries of ASLD land.

Appendix 2.
Basis for Alternative Cost Estimates

TO: Steve Walker/PHX
FROM: Willie Paiz/PHX
DATE: December 8, 1994
SUBJECT: Rawhide Detention Basin - Feasibility Study Conceptual Estimates
PROJECT: SWW37338

The attached conceptual cost estimates have been prepared based on the following assumptions and conditions.

1. Earthwork
 - Waste (excess cut) is disposed near the site, within 1/4 mile and stockpiled. No cost have been included for sale or hauling material off site.
2. Landscaping
 - A bare minimum effort of level to landscape the basin area and slopes of the embankment have been included.
3. Markups
 - Contractor markups included are for Overhead & Profit.
 - Mobilization cost of contractor equipment as well as Bonding & Insurance is included.
 - A Contingency of 20% is included. This is recommended for a conceptual level design estimate.
 - Escalation is included to account for the duration of time between the estimate and the mid point of the construction period. A 3% per year escalation factor is allowed.
4. Cost Not Included
 - Land purchases or Right of Way easements and permits
 - Engineering Fees
 - Administration or Legal Costs
 - Surveying
 - Services during construction
5. Cost Development
 - Unit cost represent average cost for the Phoenix metropolitan area. Labor, material and equipment are considered to be available with out additional cost to the contractor to import these resources.
 - Cost references include City of Scottsdale cost estimates, Local developers costs, Arizona Dept. of Transportation bid tabs, and CH2M HILL estimating data bases.

MEMORANDUM

Page 2

December 8, 1994

SWW37338

6. Opinion of costs

Include the following in the text of your report when discussing the cost alternatives. The opinions of cost shown, and resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation and implementation from the information available at the time the opinion was prepared. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. As a result, the final project costs will vary from the opinions of cost presented herein. Because of these factors, project feasibility, benefit/cost ratios, risks, and funding needs must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

TO: Steve Walker, P.E./CH2M HILL

COPIES: Clyde Anderson, P.E./Arizona State Lands Department

FROM: William A. Paiz Jr./CH2M HILL

DATE: March 1, 1995

SUBJECT: Rawhide Wash Detention Basin and Green Belt Cost Estimates

PROJECT: SWW37338.A0.T3

The attached revised conceptual cost estimates have been prepared based on the comments made at the February 16, meeting with Dave Moody/City of Phoenix, Mark Landsiedel/City of Scottsdale, V.Ottosawa-Chatupron and Clyde Anderson/Arizona State Lands Department, and Steve Walker and Willie Paiz/CH2M HILL. The revised cost also include review comments made on March 1, with Mark Landsiedel/City of Scottsdale

The following outlines the revisions to the previous cost tables dated February 16, 1995.

RAWHIDE DETENTION BASIN

Recommended Option of Basin and Spillway: Changes made to Detention Basin cost estimate.

1. Clarify the description for the placement and disposal of fill material. A portion of the excess waste would be disposed on the down-stream side of the dam embankments. For the recommended alternative (Alt. No. 4), the total waste volume was calculated to be approximately 622,500 cubic yards.

Hauling of excess fill material: At the recommendation of ASLD, hauling of excess fill material will not be included with this project. ASLD has indicated the fill material will be immediately hauled off-site to projects such as the ADOT 101 Loop, private developers, state land mineral lessees for mitigation work. Therefore, the disposal rate of excess fill material will eliminate the need to stockpile the material.

2. Landscaping acreage will include additional area for wasting fill material on the down-stream side of the dam, approximately 6.5 acres. The type of landscaping in the basin area will include both Revegetation using salvaged desert plants and a low vegetation application such as hydro seeding. Mark suggested a 60/40 split between Revegetative areas and hydro seeding areas.

Land Costs: Changes made to Additional Detention Basin cost estimate.

1. Correct the acreage of land according to the feasibility report and include the additional acreage for wasting a portion of the excess fill material on the down-stream side of the dam embankment.

MEMORANDUM

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DESERT GREENBELT

Phoenix Channelization - Option w/ Detention Basin

1. Add culverts similar to the Scottsdale Option w/ Detention Basin
2. Add Salvage and Revegetation cost at one-third the subtotal, per City of Scottsdale standard estimating approach.
3. Add Bike Paths / Multi-Use Trails same unit cost as COS, approx. \$16.57/lf.

Phoenix Channelization - Option w/o Detention Basin (high flow)

1. Recalculate the area of Salvage and Revegetation per method described above.
2. Grade Control Structures required are 2.5 each per mile of reach.
3. Bridges required will be 12 each (4 per wash).

O&M Annual Costs - Option w/ Detention Basin

1. Change the number of structures for sediment removal from 19 each to 11 each.

After recalculating these revisions to the cost estimates, the order of least cost option for the construction of the detention basin is now alternative No. 2, Non-Avoidance at \$11.5 million. The reason for this is both the revised changes noted above and there was a data error entry for the amount of fill required for the embankment. This reduced the earthwork cost by about \$400,000.

Copies of all cost tables are included for your review. If you have any questions, please do not hesitate to contact me.

ESTIMATE SUMMARY

**PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
 ADDITIONAL DETENTION BASIN COSTS**

**ESTIMATOR: W PAIZ / PHX
 PROJ. MANAGER: S WALKER / PHX
 PROJ.NO.: SWW 37338**

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	RESOURCE
1.	LAND COSTS:					
	Acreage, footprint of Basin	50.0	AC	\$15,000.00	\$750,000	Acreage per Feasibility Study, Dec. 1994, Table E-1, Alt #4.
	Acreage, footprint of wasted fill matl on slope of embankment. Approx 128,000 cy	6.5	AC	\$15,000.00	\$97,500	
	Acreage, footprint of stockpile area.	40.0	AC	\$15,000.00	\$600,000	Unit cost per Rawhide Mtg 2/6/95
	Acreage downstream of spillway, north of Jomax to foot of spillway, approx 500 ft wide x 500 ft long	6.0	AC	\$15,000.00	\$90,000	
SUBTOTAL					\$1,538,000	
MARK-UPS:						
	OVERHEAD & PROFIT	0%			\$0	
	MOBILIZATION, BONDS & INSURANCE	0%			\$6,000	
	CONTINGENCY	20%			\$309,000	
	ESCALATION TO MID PT OF CONSTRUCTION @ 3% per year one year	3%			\$56,000	
TOTAL					\$1,909,000	

ESTIMATE SUMMARY

PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
ALTERNATIVE #1 : AVOIDANCE OPTION
NOT INCLUDING SPILLWAY OPTION

ESTIMATOR: W PAIZ / PHX
PROJ. MANAGER: S WALKER / PHX
PROJ.NO.: SWW 37338

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
A. RESERVOIR CONSTRUCTION					
1.	Clear & grub	65.6	AC	\$1,600.00	\$105,025
2.	Prewetting Operation:				
	Develop water supply	1	LS	\$50,000.00	\$50,000
	Water for embankments (@88gal/cy of fill material)	756	MGAL	\$2.00	\$1,511
3.	Exc. reservoir, haul fill to embankment. Waste partial excess fill on down slope of reservoir. Remainder of excess fill hauled off-site by others.	2,110,500	CY	\$1.60	\$3,376,800
4.	Finish Grading	146,800	SY	\$0.25	\$36,700
	Slope protection at Inlet to Reservoir, Riprap w/geotextile	16,000	SY	\$8.00	\$128,000
B. EARTH DAM EMBANKMENT CONSTRUCTION					
Earth Embankment Construction					
	Spread fill, received from scraper operation	332,500	CY	\$0.75	\$249,375
b.	Compact fill material	332,500	CY	\$3.00	\$997,500
	Finish grading slopes	170,900	SY	\$0.25	\$42,725
Chimney Drain Construction:					
a.	Excavation for chimney drain, (1500LFx 5'Wx15'Havg)	4,200	CY	\$2.50	\$10,500
	Placement of drain material	4,200	CY	\$8.00	\$33,600
	Drain collection pipe	1,000	LF	\$5.00	\$5,000
C. SPILLWAY					
	Not included, see options for 200 LF spillway.				
D. DOWNSTREAM IMPROVEMENTS					
1.	Downstream improvements to channel	1	LS	\$50,000.00	\$50,000
E. SITE DEVELOPMENT					
1.	Access Road at Dam crest	1,500	LF	\$5.00	\$7,500
Landscaping W/ salvaged native plants					
	Salvage of existing plants, to be reused as Reveg.	65.6	AC	\$21,780.00	\$1,429,650
b.	Exterior slopes of embankment, Max. vegetation	35.3	AC	\$43,560.00	\$1,538,100
c.	Basin vegetation w/ Revegetation and hydro seeding	30.3	AC	\$27,000.00	\$818,926
	Archaeological Site	1	LS	\$10,000.00	\$10,000
SUBTOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$8,890,000
MARK-UPS:					
	OVERHEAD & PROFIT	5%			\$440,000
	MOBILIZATION, BONDS & INSURANCE	4%			\$370,000
	CONTINGENCY	20%			\$1,940,000
	ESCALATION @ 3% per year - one year	3%			\$350,000
TOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$11,990,000

ESTIMATE SUMMARY

PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
ALTERNATIVE #2 : NON-AVOIDANCE OPTION
NOT INCLUDING SPILLWAY OPTION

ESTIMATOR: W PAIZ / PHX
PROJ. MANAGER: S WALKER / PHX
PROJ.NO.: SWW 37338

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
A	RESERVOIR CONSTRUCTION				
1.	Clear & grub	57.8	AC	\$1,600.00	\$92,430
2.	Prewetting Operation:				
a.	Develop water supply	1	LS	\$50,000.00	\$50,000
b.	Water for embankments (@88gal/cy of fill material)	536	MGAL	\$2.00	\$1,073
3.	Exc. reservoir, haul fill to embankment. Waste partial excess fill on down slope of reservoir. Remainder of excess fill hauled off-site by others.	2,023.800	CY	\$1.60	\$3,238,080
4.	Finish Grading	155,000	SY	\$0.25	\$38,750
5.	Slope protection at Inlet to Reservoir, Riprap w/geotextile	16,000	SY	\$8.00	\$128,000
B	EARTH DAM EMBANKMENT CONSTRUCTION				
	Earth Embankment Construction				
a.	Spread fill, received from scraper operation	236,000	CY	\$0.75	\$177,000
b.	Compact fill material	236,000	CY	\$3.00	\$708,000
c.	Finish grading slopes	124,600	SY	\$0.25	\$31,150
2.	Chimney Drain Construction:				
a.	Excavation for chimney drain, (1400LFx 5'Wx15'Havg)	3,900	CY	\$2.50	\$9,750
b.	Placement of drain material	3,900	CY	\$8.00	\$31,200
c.	Drain collection pipe	1,000	LF	\$5.00	\$5,000
C	SPILLWAY				
	Not included, see options for 200 LF spillway.				
D	DOWNSTREAM IMPROVEMENTS				
1.	Downstream improvements to channel	1	LS	\$50,000.00	\$50,000
	SITE DEVELOPMENT				
1.	Access Road at Dam crest	1,400	LF	\$5.00	\$7,000
	Landscaping W/ salvaged native plants				
a.	Salvage of existing plants, to be reused as Reveg.	57.8	AC	\$21,780.00	\$1,258,200
b.	Exterior slopes of embankment, Max. vegetation	25.7	AC	\$43,560.00	\$1,121,400
c.	Basin vegetation w/ Revegetation and hydro seeding	32.0	AC	\$27,000.00	\$864,669
	Archaeological Site	1	LS	\$10,000.00	\$10,000
SUBTOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$7,820,000
MARK-UPS:					
	OVERHEAD & PROFIT	5%			\$390,000
	MOBILIZATION, BONDS & INSURANCE	4%			\$330,000
	CONTINGENCY	20%			\$1,710,000
	ESCALATION @ 3% per year - one year	3%			\$310,000
TOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$10,560,000

ESTIMATE SUMMARY

PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
ALTERNATIVE #3 : ZONED BASIN OPTION
NOT INCLUDING SPILLWAY OPTION

ESTIMATOR: W PAIZ / PHX
PROJ. MANAGER: S WALKER / PHX
PROJ.NO.: SWW 37338

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
A	RESERVOIR CONSTRUCTION				
1.	Clear & grub	61.8	AC	\$1,600.00	\$98,843
2.	Prewetting Operation:				
a.	Develop water supply	1	LS	\$50,000.00	\$50,000
b.	Water for embankments (@88gal/cy of fill material)	787	MGAL	\$2.00	\$1,574
3.	Exc. reservoir, haul fill to embankment. Waste partial excess fill on down slope of reservoir. Remainder of excess fill hauled off-site by others.	1,868,800	CY	\$1.60	\$2,990,080
4.	Finish Grading	189,000	SY	\$0.25	\$47,250
5.	Slope protection at Inlet to Reservoir, Riprap w/geotextile	16,000	SY	\$8.00	\$128,000
B	EARTH DAM EMBANKMENT CONSTRUCTION				
1.	Earth Embankment Construction				
a.	Spread fill, received from scraper operation	346,300	CY	\$0.75	\$259,725
b.	Compact fill material	346,300	CY	\$3.00	\$1,038,900
c.	Finish grading slopes	110,000	SY	\$0.25	\$27,500
2.	Chimney Drain Construction:				
a.	Excavation for chimney drain, (1500LFx 5'Wx15'Havg)	4,200	CY	\$2.50	\$10,500
b.	Placement of drain material	4,200	CY	\$8.00	\$33,600
c.	Drain collection pipe	1,000	LF	\$5.00	\$5,000
C	SPILLWAY				
	Not included, see options for 200 LF spillway.				
D	DOWNSTREAM IMPROVEMENTS				
	Downstream improvements to channel	1	LS	\$50,000.00	\$50,000
	SITE DEVELOPMENT				
1.	Access Road at Dam crest	1,500	LF	\$5.00	\$7,500
2.	Landscaping W/ salvaged native plants				
a.	Salvage of existing plants, to be reused as Reveg.	61.8	AC	\$21,780.00	\$1,345,500
b.	Exterior slopes of embankment, Max. vegetation	22.7	AC	\$43,560.00	\$990,000
c.	Basin vegetation w/ Revegetation and hydro seeding	39.0	AC	\$27,000.00	\$1,054,339
	Archaeological Site	1	LS	\$10,000.00	\$10,000
SUBTOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$8,150,000
MARK-UPS:					
	OVERHEAD & PROFIT	5%			\$410,000
	MOBILIZATION, BONDS & INSURANCE	4%			\$340,000
	CONTINGENCY	20%			\$1,780,000
	ESCALATION @ 3% per year - one year	3%			\$320,000
TOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$11,000,000

ESTIMATE SUMMARY

**PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
 ALTERNATIVE #4 : MINIMUM GRADING
 NOT INCLUDING SPILLWAY OPTION**

**ESTIMATOR: W PAIZ / PHX
 PROJ. MANAGER: S WALKER / PHX
 PROJ.NO.: SWW 37338**

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
A	RESERVOIR CONSTRUCTION				
1.	Clear & grub	46.5	AC	\$1,600.00	\$74,380
2.	Prewetting Operation:				
a.	Develop water supply	1	LS	\$50,000.00	\$50,000
b.	Water for embankments (@88gal/cy of fill material)	783	MGAL	\$2.00	\$1,566
3.	Exc. reservoir, haul fill to embankment. Waste partial excess fill on down slope of reservoir. Remainder of excess fill hauled off-site by others.	967,100	CY	\$1.60	\$1,547,360
4.	Finish Grading	97,000	SY	\$0.25	\$24,250
5.	Slope protection at Inlet to Reservoir, Riprap w/geotextile	16,000	SY	\$8.00	\$128,000
B.	EARTH DAM EMBANKMENT CONSTRUCTION				
1.	Earth Embankment Construction				
a.	Spread fill, received from scraper operation	344,600	CY	\$0.75	\$258,450
b.	Compact fill material	344,600	CY	\$3.00	\$1,033,800
c.	Finish grading slopes	128,000	SY	\$0.25	\$32,000
2.	Chimney Drain Construction:				
a.	Excavation for chimney drain, (1350LFx 5'Wx20'Havg)	5,000	CY	\$2.50	\$12,500
b.	Placement of drain material	5,000	CY	\$8.00	\$40,000
c.	Drain collection pipe	1,000	LF	\$5.00	\$5,000
C.	SPILLWAY				
	Not included, see options for 700 LF spillway				
D.	DOWNSTREAM IMPROVEMENTS				
1.	Downstream improvements to channel	1	LS	\$50,000.00	\$50,000
E.	SITE DEVELOPMENT				
1.	Access Road at Dam crest	1,350	LF	\$5.00	\$6,750
2.	Landscaping W/ salvaged native plants				
a.	Salvage of existing plants, to be reused as Reveg.	46.5	AC	\$21,780.00	\$1,012,500
b.	Exterior slopes of embankment, Max. vegetation	26.4	AC	\$43,560.00	\$1,152,000
c.	Basin vegetation w/ Revegetation and hydro seeding	20.0	AC	\$27,000.00	\$541,116
3.	Archaeological Site	1	LS	\$10,000.00	\$10,000
SUBTOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$5,980,000
MARK-UPS:					
	OVERHEAD & PROFIT	5%			\$300,000
	MOBILIZATION, BONDS & INSURANCE	4%			\$250,000
	CONTINGENCY	20%			\$1,310,000
	ESCALATION @ 3% per year - one year	3%			\$240,000
TOTAL BASIN & EMBANKMENT CONSTRUCTION COST					\$8,080,000

Appendix 3.
Cost Estimates for Channelization in Phoenix and Scottsdale

ESTIMATE SUMMARY

PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
ADDITIONAL DETENTION BASIN COSTS

ESTIMATOR: W PAIZ / PHX
 PROJ. MANAGER: S WALKER / PHX
 PROJ.NO.: SWW 37338

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	RESOURCE
	Phoenix Channelization - High Flow Option					
	1500+ CFS FLOW DESIGN:					
1.	Earthwork	1,168,219	CY	\$2.50	\$2,920,548	Qty & Cost dev per ASLD Rawhide/Pinnacle Peak Wash Alig Stdy 92, cost escalated 3%/yr for 3 yrs = 9% Rawhide/Pinnacle Peak Wash Alig Stdy 92, cost escalated 3%/yr for 3 yrs = 9% Approximated avg cost per structure, per 1992 COS cost detail for Greenbelt. Per 1992 COS cost detail for Green belt, escalated to 1995 \$. Rawhide/Pinnacle Peak Wash Alig Stdy 92, cost escalated 3%/yr for 3 yrs = 9% Rawhide/Pinnacle Peak Wash Alig Stdy 92, cost escalated 3%/yr for 3 yrs = 9%
2.	Berms, \$/LF of alignment	48,000	LF	\$25.00	\$1,200,000	
3.	Soil Cement, \$/LF of alignment	48,000	LF	\$170.00	\$8,160,000	
4.	Grade Control Structures	22	EA	\$57,000.00	\$1,254,000	
5.	Bridges, (approx. 25,000 sf each @ \$50/sf)	12	EA	\$1,250,000.00	\$15,000,000	
6.	Clear & Grub	48,000	LF	\$26.16	\$1,255,680	
7.	Bike Paths/Multi-Use Trails	48,000	LF	\$16.57	\$795,360	
8.	Salvage/Reveg	1	LS	\$9,175,676.25	\$9,175,676	
	SUBTOTAL				\$39,761,264	
	MARK-UPS:					
	OVERHEAD & PROFIT	5%			\$1,988,000	
	MOBILIZATION, BONDS & INSURANCE	4%			\$1,670,000	
	CONTINGENCY	20%			\$8,684,000	
	ESCALATION TO MID PT OF CONSTRUCTION @ 3% per year one year	3%			\$1,563,000	
	TOTAL				\$53,666,000	

ESTIMATE SUMMARY

PROJECT: RAWHIDE DETENTION BASIN - FEASIBILITY STUDY
ADDITIONAL DETENTION BASIN COSTS

ESTIMATOR: W PAIZ / PHX
 PROJ. MANAGER: S WALKER / PHX
 PROJ.NO.: SWW 37338

#	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL	RESOURCE
	Scottsdale Channelization - High Flow Option					
	Per 1992 Study - Rawhide / Pinnacle Peak Wash, escalated to 1995 dollars at 3%/year					
	1. Construction Costs	1	LS	\$12,142,000	\$12,142,000	Does not include land costs
	SUBTOTAL				\$12,142,000	
	MARK-UPS:					
	OVERHEAD & PROFIT	5%			\$607,000	
	MOBILIZATION, BONDS & INSURANCE	4%			\$510,000	
	CONTINGENCY	0%			\$0	Included in 1992 Study, 25%
	ESCALATION TO MID PT OF CONSTRUCTION @ 3% per year one year	3%			\$398,000	
	TOTAL				\$13,657,000	

**Rawhide Wash Detention Basin and Green Belt
Conceptual Cost Alternatives**

Description	Option w/ Detention Basin		Option w/o Detention Basin	
	Capital Costs	O&M Cost	Capital Costs	O&M Cost
Rawhide Detention Basin:				
Detention Basin - Recommended Option	\$11,800,000.			
Land Cost	\$1,909,000			
Excess Fill Hauling	\$0			
O&M Annual Costs:				
Sediment Maintenance		\$19,000		\$0
Subtotal Detention Basin	\$13,709,000	\$19,000	\$0	\$0
Desert Greenbelt Costs				
Phoenix Channelization	\$1,515,000		\$53,666,000	
Scottsdale Channelization	\$356,000		\$13,657,000	
O&M Annual Costs:				
Sediment Maintenance		\$7,000		\$129,000
Subtotal Greenbelt	\$1,871,000	\$7,000	\$67,323,000	\$129,000
TOTAL COSTS	\$15,580,000	\$26,000	\$67,323,000	\$129,000