

FLOODPLAIN AND EROSION HAZARD MANAGEMENT ORDINANCE NO. 1988-FC2

FOR PIMA COUNTY, ARIZONA

PASSED AND ADOPTED BY THE BOARD OF SUPERVISORS

SITTING AS THE BOARD OF DIRECTORS OF THE

PIMA COUNTY FLOOD CONTROL DISTRICT

DECEMBER 6, 1988

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DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

1313 S. MISSION ROAD

TUCSON, ARIZONA 85713

WILLIAM T. HOWELLS

DIRECTOR AND COUNTY ENGINEER

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PIMA COUNTY ORDINANCE NO. 1988-FC2

TITLE: An Ordinance for Pima County, Arizona, adopting regulations for the subdivision of land, construction of dwelling units and commercial and industrial structures, or uses which may divert, retard or obstruct flood water and threaten public health, safety or the general welfare; adopting maps and criteria outlining regulatory floodplain and floodway areas; providing for the coordination by the Floodplain Management Board with all other interested and affected political subdivisions and State agencies; establishing appeals; providing for the adjustment, amendment, and enforcement of said Ordinance; and prescribing penalties for the violation thereof. Replacing Ordinance No. 1988-FC1 adopted by the Board of Supervisors on April 12, 1988 replacing Ordinance No. 1985-FC1 adopted by the Board of Supervisors on May 7, 1985 replacing Ordinance No. 1983-FC1 adopted by the Board of Supervisors on July 12, 1983 which replaced Ordinance No. 1974-86 adopted by the Board of Supervisors on December 16, 1974.

ARTICLE I

SHORT TITLE: This Ordinance may be referred to as the Floodplain and Erosion Hazard Management Ordinance.

ARTICLE II

STATEMENT OF PURPOSE: INTERPRETATION; APPLICATION AND AREA OF JURISDICTION

- A. This Ordinance shall apply only within regulatory floodplain and erosion hazard areas.
- B. This Ordinance is one aspect of land and resource management planning for Pima County. Floodplain management must be seen in perspective, not only as flood hazard minimization; but as one element of an integrated program of natural resource management and flood and erosion hazard reduction.

The Floodplain Management Board recognizes that it is both necessary and desirable to maintain a balanced and cooperative relationship between human communities and the land and resources which sustain them. Maintaining the stability, health, diversity and natural flora and fauna of the environment is essential.

It is the intent of the Floodplain Management Board that:

1. The highest and best use of regulatory floodplains in Pima County be for maintenance of hydrologic and hydraulic processes, with consideration for groundwater recharge, aesthetics, natural open space, recreation areas and wildlife habitat.
 2. Any human habitation or structural developments which limit natural processes within floodprone or erosion hazard areas be discouraged and limited to the extent allowable by law.
 3. The county acquire, by appropriate means, lands within the regulatory floodplain and erosion hazard areas, and that these lands be managed by the Pima County Flood Control District to preserve or enhance natural values and expressed resource management goals.
 4. Regulatory land use control for floodplain management emphasize overall watershed management, and that floodplain management be used to prevent unwise human occupation or encroachment into regulatory floodplain and erosion hazard areas.
 5. Natural floodprone areas, streams, washes, arroyos, rivers, and drainage courses, whenever possible, be preserved in their natural riverine condition and that any land use proposal which utilizes this approach be considered superior to all others.
- C. The purpose of this Ordinance is to protect the public health, safety, and general welfare of the citizens of Pima County by adopting regulations designed:

1. To minimize flood and erosion damages;
2. To meet or exceed state and federal requirements relating to floodplain management, thereby enabling Pima County residents to purchase low cost flood insurance, receive disaster relief should the need arise, and to seek residential and commercial real estate loans;
3. To establish minimum flood protection elevations and damage prevention requirements for structures and other types of development which may be vulnerable to flood and erosion damage;
4. To regulate encroachment and building development within areas subject to flooding or erosion, and to assure that the flood carrying capacity within the altered and/or relocated portion of any watercourse is maintained;
5. To encourage the most effective expenditures of public money for flood control projects;
6. To minimize the need for rescue and relief efforts associated with flooding and erosion generally undertaken at the expense of the general public;
7. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and ridges located in regulatory floodplain and erosion hazard areas;
8. To help maintain a stable tax base by providing for the protection of regulatory floodplain and erosion hazard areas;
9. To inform the public when property is in a regulatory floodplain or erosion hazard area;
10. To insure that those who occupy the areas within a regulatory floodplain and erosion hazard area assume the responsibility for their actions;

11. To protect, preserve and enhance groundwater recharge;
 12. To encourage the preservation of natural washes and enhance the riverine environment.
- D. In the interpretation and application of this Ordinance, all provisions shall be:
1. Considered as minimum requirements;
 2. Liberally construed in favor of the governing body; and
 3. Deemed neither to limit nor repeal any other powers granted to Pima County under any state statute. Where this Ordinance conflicts with or overlaps any other ordinance or regulation, whichever imposes the more stringent restrictions for the health, safety and welfare of the public shall prevail.
- E. This Ordinance shall be applicable and enforceable in the incorporated as well as the unincorporated areas of Pima County, including public lands, but excluding Indian and military reservations and those incorporated areas of cities or towns which have elected to assume separate floodplain management powers and duties pursuant to Section 48-3610 of the Arizona Revised Statutes.
- F. The performance requirements as specified in this Ordinance are minimum standards and address general floodplain management requirements. Specific projects may warrant additional requirements. The Floodplain Management Board and the County Engineer have the authority to establish standards and/or policies as necessary to carry out the provisions of this Ordinance. All drainage design standards, river and basin management plans, or other land use plans approved by the Board of Supervisors or Floodplain Management Board are hereby incorporated into this Ordinance.

ARTICLE III

WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on occasion or the flood height may be increased by man-made or natural causes, such as bridge openings restricted by debris. This Ordinance does not imply that areas outside floodways and floodway fringe areas, or land uses permitted within such areas, will be free from flooding or flood damage. This Ordinance shall not create liability on the part of Pima County, the Pima County Flood Control District, the Pima County Floodplain Management Board, or any officer or employee thereof for any flood damages that may result from reliance on this Ordinance or any administrative decision based upon this ordinance.

ARTICLE IV

DEFINITIONS

The following definitions shall apply to words and phrases used in this Ordinance.

Balanced Drainage Basin: A drainage basin or watershed which contains floodwater channels, natural or man-made, and/or flood control structures that are adequate to contain existing runoff from the base flood produced by the basin or watershed; but in which additional runoff may not be safely contained by said channels or structures.

Base Flood: The base flood (Q₁₀₀) shall mean the peak discharge of a 100-year flood. The base flood has a one percent probability of being equalled or exceeded in any given year. Said flood shall be determined from an analysis of floods on a particular watercourse and other watercourses in the same general region in accordance with the criteria established by the Director of the Arizona Department of Water Resources, or the Pima County Flood Control District Board, which criteria is hereby incorporated by reference and made a part of this Ordinance.

Base Flood Elevation: The calculated water-surface elevation of the base flood.

County Engineer: An official of Pima County whose duties are set forth in Arizona Revised Statutes 11-562 and 48-3603. Also, the Director of the Pima County Department of Transportation and Chief Engineer of the Pima County Flood Control District.

Critical Drainage Basin: A drainage basin or watershed which contains floodwater channels, natural or man-made, and/or flood control structures that cannot contain existing runoff produced by the base flood within the basin or watershed, and which has a documented history of severe flooding hazards.

Critical or Balanced Drainage Basin Management Plan: A site specific plan for a balanced/critical basin or watershed which has been prepared for and approved by Pima County and provides a conceptual plan for orderly development of flood control/floodplain management measures within the basin or watershed.

Detention System: A type of flood control system which delays the downstream progress of flood waters in a controlled manner, generally through the combined use of a temporary storage area and a metered outlet device which causes a lengthening of the duration of flow and thereby reduces downstream flood peaks.

Development: Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, fencing, excavating or drilling.

Drainage Area: The contributing area to a single point of drainage concentration, expressed in units of area. Also called catchment area, watershed, and river basin.

Dry Well: A deep hole, covered and designed in such a manner so as to hold drainage water until it infiltrates into the ground.

Dwelling Unit: A place of residence which may be located in a single or multiple dwelling building or a manufactured home.

Encroachment, Equal Degree of: Encroachment is the advancement or infringement of uses, fill, or structures into any regulatory floodplain in a manner that impedes the flow capacity of the channel and regulatory floodplain of a watercourse. An equal degree of encroachment is a standard applied to the evaluation of the effects of the encroachment on increases in flood heights. It assumes that an encroachment, if permitted, may confer on all property owners on both sides of the watercourse an equal right to encroach to the same degree within that reach. Since the factors affecting hydraulic efficiency are usually not uniform within a reach, this standard may not result in equal measured distances between floodway limit lines and the regulatory floodplain boundaries of the watercourse.

Erosion Hazard Area: Land adjoining a watercourse regulated by this ordinance which is deemed by the County Engineer to be subject to flood-related erosion losses.

Flood or Floodwaters: A temporary rise in water level, including groundwater or overflow of water onto lands not normally covered by water.

Floodplain Management: The operation of an integrated natural resource management program, encompassing corrective and preventive measures for reducing flood and erosion damage, including but not limited to emergency preparedness planning, flood control works and floodplain management regulations.

Floodplain Management Board: The Board of Supervisors of Pima County sitting as the Board of Directors of the Pima County Flood Control District.

Floodplain Management Regulations: The codes, ordinances and other regulations relating to the use of land and construction within the regulatory floodplain, including zoning ordinances, subdivision regulations, building codes, housing codes, setback requirements, open area regulations and similar methods of control affecting the use and development of these areas.

Floodplain Use Permit: An official document which authorizes specific activity within a regulatory floodplain or erosion hazard area.

Flood Proofing: Provisions, changes, or adjustments primarily used for the reduction or elimination of flood damages to property and improvements subject to flooding.

Floodway Area: The channel of a watercourse and the adjacent land areas necessary in order to discharge the base flood without cumulatively increasing the water surface more than one foot above the base flood elevation and without creating hazardous velocities of flood waters. (See Exhibit 1 on following page).

Floodway Fringe Area: Land outside the floodway but within the regulatory floodplain and below the base flood elevation.

Geologic Floodplain: That portion of the land that has, in the geologic past, been subject to fluvial processes. The geologic floodplain may be different than the regulatory floodplain.

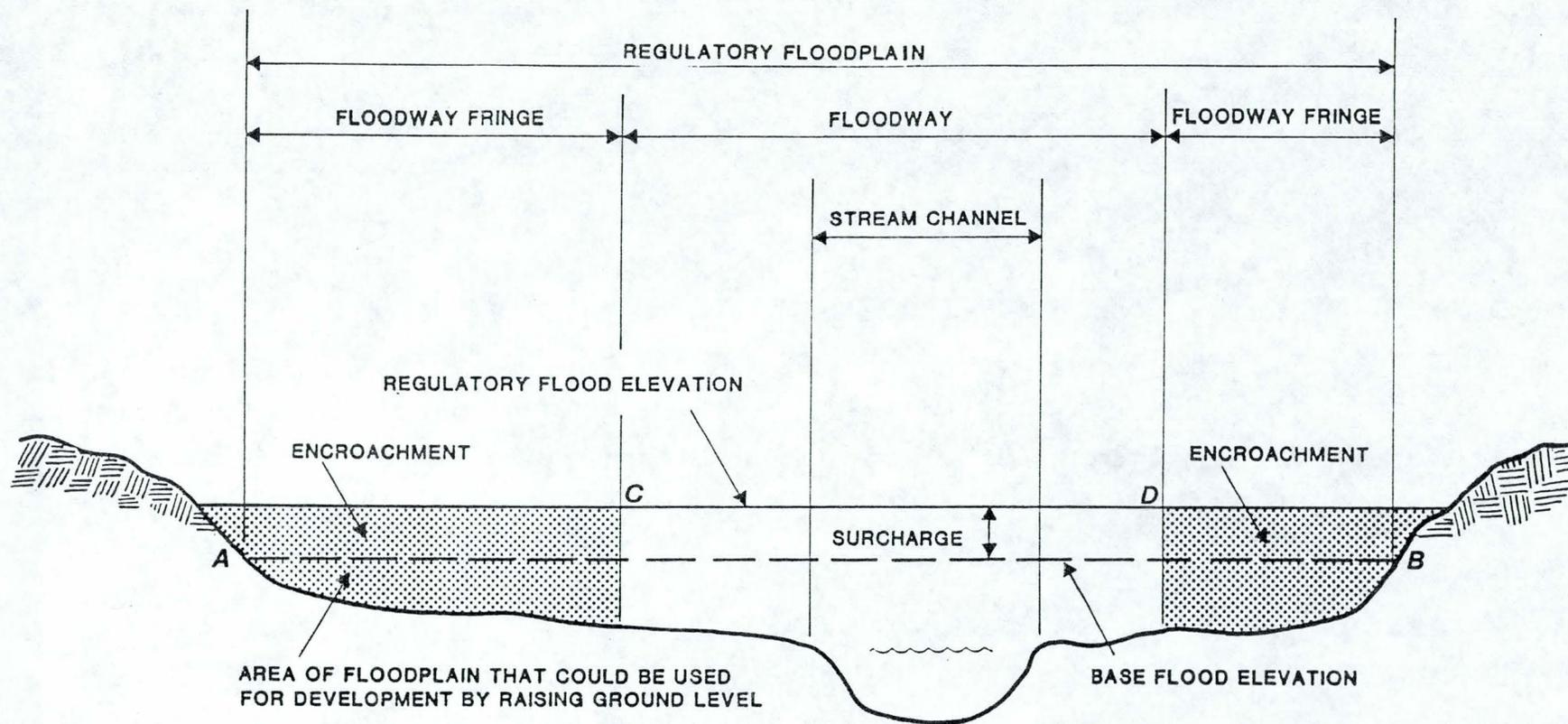
Levee: A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

Lowest Floor: The floor of the lowest enclosed area of any development.

Manufactured Home: A structure transportable in one or more sections which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term manufactured home also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than 180 consecutive days.

Manufactured Home Park or Subdivision: A parcel (or contiguous parcels) of land divided into four or more manufactured home lots for sale or rent.

Mean Sea Level: For purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.



LINE *AB* IS THE BASE FLOOD ELEVATION (100 YEAR FLOOD)
 LINE *CD* IS THE REGULATORY FLOOD ELEVATION (1.0 FOOT ABOVE BASE FLOOD ELEVATION)
 SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT), OR LESS IF SPECIFIED BY COUNTY

EXHIBIT 1

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Obstruction: Any physical alteration in, to, along, across, or projecting into any watercourse which may impede, retard or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water, or that is placed where a flow of water might carry the same downstream. Examples include, but are not limited to, the following: any dam, wall, embankment, levee, dike, pile, abutment, projection, excavation, channel rectification, bridge, conduit, culvert, building, wire, fence, rock, gravel, refuse, fill, structure or vegetation.

Person: Any individual or his agent, firm, partnership, association, corporation, or agent of the aforementioned groups, or the State or any agency or political subdivision thereof.

Reach: A hydraulic engineering term used to describe longitudinal segments of a stream or watercourse. In an urban area an example of a reach would be the segment of a watercourse between two consecutive bridge crossings.

Reclamation Plan: A plan for sand and gravel operations which defines hydrologic and hydraulic constraints; outlines methods of extraction, operation and site development, and provides for backfilling procedures and final site reclamation.

Regulatory Flood Elevation: The elevation which is one foot above the calculated water-surface elevation of the base flood.

Regulatory Floodplain or Floodprone Area: That portion of the geologic floodplain associated with a watercourse or that area where drainage is or may be restricted by man-made structures and that would be inundated by the base flood where the peak discharge of the flow is one-hundred cubic feet per second (cfs) or greater, or those areas which are subject to sheet flooding, or those areas mapped as being floodprone on existing recorded subdivision plats (See Exhibit 1).

Retention System: A type of flood control system which stops the downstream progress of flood waters by employing methods of total containment.

Setback: The minimum horizontal distance between a structure and a watercourse. On each side of a watercourse, the setback is measured from the top edge of the highest channel bank or edge of the base flood water-surface elevation, whichever is closer to the channel centerline.

Sheet Flooding: Those areas which are subject to flooding with depths of one-half foot or greater during the base flood where a clearly defined channel does not exist and the path of the flooding is often unpredictable and indeterminate.

Structure: Anything constructed or erected, the use of which requires location on the ground or attachment to some foundation having a location on the ground.

Variance: A grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by his ordinance.

Violation: The failure of a structure or other development to be fully compliant with this ordinance.

Watercourse: Any lake, river, stream, creek, wash, arroyo, or other body of water or channel having banks and bed through which waters flow at least periodically.

Watershed: The drainage area above a point on a watercourse.

ARTICLE V

STATUTORY EXEMPTIONS: NON-CONFORMING USES

- A. As specified in Arizona Revised Statute (A.R.S.) §48-3609, the provisions of this Ordinance shall not affect or prohibit:
1. Existing legal uses of property or the right to continuation of such legal use. However, if a non-conforming use of land, or a building or structure is discontinued for twelve consecutive months or destroyed to the extent of fifty percent

of its value, as determined by a competent appraiser, any further use shall comply with this Ordinance.

2. Reasonable repair or alteration of property for the purposes for which the property was legally used on December 16, 1974 except that any alteration, addition or repair to a non-conforming building or structure which would result in increasing its flood damage potential by fifty percent or more shall be either flood-proofed or elevated to, at, or above the regulatory flood elevation.
3. Reasonable repair of structures constructed with the written authorization required by A.R.S. §48-3613 and Article V, Section B of this Ordinance.
4. Facilities constructed or installed pursuant to a certificate of environmental compatability issued pursuant to Title 40, Chapter 2, Article 6.2 of A.R.S. §40-360 *et seq.*

B. As specified in A.R.S. §48-3613, before construction of the following may begin, plans for the construction must be submitted to the Floodplain Management Board for review and comment; however, the following shall not be prohibited and shall not require a Floodplain Use Permit or other written authorization:

1. The construction of bridges, culverts, dikes and other structures necessary for the construction of public highways, roads and streets intersecting or crossing a watercourse.
2. The construction of storage dams for watering livestock or wildlife and structures on banks of a watercourse to prevent erosion of or damage to adjoining land if the structure will not divert, retard or obstruct the natural channel of the watercourse or dams for the conservation of floodwaters as permitted by Title 45, Chapter 6 of A.R.S. §45-1201 *et seq.*
3. Construction of tailing dams and waste disposal areas used in connection with mining and metallurgical operations. This paragraph does not exempt those sand and gravel operations which will divert, retard or obstruct the flow of

of its value, as determined by a competent appraiser, any further use shall comply with this Ordinance.

2. Reasonable repair or alteration of property for the purposes for which the property was legally used on December 16, 1974 except that any alteration, addition or repair to a non-conforming building or structure which would result in increasing its flood damage potential by fifty percent or more shall be either flood-proofed or elevated to, at, or above the regulatory flood elevation.
3. Reasonable repair of structures constructed with the written authorization required by A.R.S. §48-3613 and Article V, Section B of this Ordinance.
4. Facilities constructed or installed pursuant to a certificate of environmental compatibility issued pursuant to Title 40, Chapter 2, Article 6.2 of A.R.S. §40-360 *et seq.*

B. As specified in A.R.S. §48-3613, before construction of the following may begin, plans for the construction must be submitted to the Floodplain Management Board for review and comment; however, the following shall not be prohibited and shall not require a Floodplain Use Permit or other written authorization:

1. The construction of bridges, culverts, dikes and other structures necessary for the construction of public highways, roads and streets intersecting or crossing a watercourse.
2. The construction of storage dams for watering livestock or wildlife and structures on banks of a watercourse to prevent erosion of or damage to adjoining land if the structure will not divert, retard or obstruct the natural channel of the watercourse or dams for the conservation of floodwaters as permitted by Title 45, Chapter 6 of A.R.S. §45-1201 *et seq.*
3. Construction of tailing dams and waste disposal areas used in connection with mining and metallurgical operations. This paragraph does not exempt those sand and gravel operations which will divert, retard or obstruct the flow of

waters in a watercourse from complying with and acquiring authorization from the Floodplain Management Board pursuant to the regulations adopted by the Floodplain Management Board under this Ordinance.

4. Other construction, if it is determined by the Floodplain Management Board that written authorization is unnecessary.
 5. Construction by any flood control district, county, city, town or other political subdivision exercising powers granted to it under Title 48, Chapter 21, Article 1 of A.R.S. §48-3601 *et seq.*
 6. The construction of streams, waterways, lakes and other auxiliary facilities in conjunction with development of public parks and recreation facilities by a public agency or political subdivision.
 7. The construction and erection of poles, towers, foundations, support structures, guy wires, and other facilities related to power transmission as constructed by any utility, whether a public service corporation or a political subdivision.
- C. This article shall not exempt any person from obtaining a Floodplain Use Permit as set forth in this Ordinance for any use which diverts, retards or obstructs the flow of water and creates a danger or hazard to life or property in the area.
- D. These exemptions do not preclude any person from liability if that person's actions increase flood hazards to any other person or property.
- E. Non-Conforming Uses.
1. Improvements to or reconstruction of existing non-conforming uses.
 - a. Any structure which is repaired, reconstructed, or substantially improved at a cost equal to or exceeding fifty percent of the value of the structure as shown on the latest assessment rolls of the Pima County Assessor either (a) before the improvement or repair is started; or (b) if the structure has been damaged and is being restored, before the damage occurred, shall conform to the provisions of this Ordinance. For the purpose of determining the value of any such construction, repair or

alteration, the normal retail value of the materials and the reasonable value of the labor performed shall be used. No person shall repair or alter property in a piecemeal manner so as to avoid the provisions of this section.

- b. For the purpose of this article substantial improvement is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimension of the structure. The term does not, however, include any project for improvement of a structure to comply with existing State or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions.
2. Discontinuance of Non-Conforming Use. In the event that the use of a non-conforming use is discontinued for a period of twelve consecutive months, any further use thereof shall be in conformity with the provisions of this Ordinance.

ARTICLE VI

FLOODPLAIN MAPS AND BOUNDARIES

- A. The boundaries of the regulatory floodplains and the floodways for which adequate hydrologic and hydraulic data is available for their delineation on maps shall be shown on maps maintained by the Pima County Engineer.
 1. The Federal Emergency Management Agency (FEMA) has identified certain flood hazard areas in an engineering report entitled "The Flood Insurance Study for the Unincorporated Areas of Pima County, Arizona", hereinafter referred to as The Flood Insurance Study, dated February 15, 1983, with accompanying Flood Insurance Rate Maps and Flood Boundary and Floodway Maps, as well as Flood Insurance Studies, Flood Insurance Rate Maps and Flood Hazard Boundary Maps for the incorporated cities within Pima County, all of which are hereby incorporated by reference and declared to be a part of this Ordinance. The delineation of the regulatory floodplains and the floodways shown on these

maps shall be the regulatory floodplains and floodways governed by this Ordinance for those watercourses studied with the exception of the Santa Cruz River and Rillito Creek. The Flood Insurance Study and the accompanying maps are on file in the offices of the Pima County Department of Transportation and Flood Control District. Amendments by FEMA to the Flood Insurance Study and its accompanying maps shall be incorporated in the floodplain maps maintained by the County Engineer.

2. Due to continuously and episodically changing hydrologic and hydraulic conditions on the watercourses within Pima County, base flood peak discharges, flow volumes, and associated regulatory floodplain and erosion hazard areas are continuously subject to revision. At a minimum, base flood values will meet or exceed the current values established by the FEMA, and reflect historic flood information and general, current, watershed conditions. Current regulatory floodplain and erosion hazard area maps will be maintained by the County Engineer for the Santa Cruz River and Rillito Creek.
 - a. The regulatory floodplains and floodways for the Santa Cruz River and Rillito Creek shall be based upon the historic flood limit or flood hazard boundary maps prepared by Pima County, whichever is more restrictive, where no flood control improvements exist. As flood repair and flood control improvements are constructed, the County Engineer will prepare revised floodplain maps for the purpose of regulation.
 - b. All watersheds which generate flood peak discharges exceeding 5,000 cfs for the base flood discharge shall have their flood peak discharges listed by the County Engineer and adopted by the Board of Directors of the Flood Control District (See Appendix 1 of this Ordinance). These discharges will be amended, if necessary, as revised base flood discharge estimates become available.
3. In those areas where the regulatory regulatory floodplain and erosion hazard areas are not delineated pursuant to paragraphs 1 and 2 of this article, and upon request for a county permit the County Engineer may require the land owner to establish the regulatory floodplain and floodway limits through a hydrologic and hydraulic study prepared by an Arizona Registered Professional Civil Engineer.

4. In those areas where a hydrologic and hydraulic study has been prepared by an Arizona Registered Professional Civil Engineer which delineates the regulatory floodplains, floodways, and erosion hazard areas and has been approved by the County Engineer, the delineation of those boundaries shown within the study shall be the regulatory floodplain, floodway, and erosion hazard areas governed by this Ordinance.
5. Prior to the release of assurances for subdivisions or certificate of occupancy for development plans, construction of any improvement which changes the configuration of the delineated floodplain contained in the Flood Insurance Study, whether upstream of, downstream from or adjacent to the development, the owner shall provide to Pima County a new delineation of all regulatory floodplains affected by the improvement. The new delineations and reports shall be prepared in conformance with the requirements of FEMA, the Director of Water Resources and this ordinance. Pima County will submit the required flood insurance study information to FEMA within 15 days of receipt.
6. Engineering studies showing the regulatory floodplain and erosion hazard areas may be prepared under the direction of the County Engineer. Upon approval by the County Engineer, these maps shall be the regulatory floodplain and erosion hazard areas governed by this Ordinance.
7. Where a question arises as to the location of any regulatory floodplain, floodway or erosion hazard area, the question shall be decided by the County Engineer, whose decision shall be final except as provided for in Article XV of this Ordinance. Any person contesting the location of any boundary shall be given a reasonable opportunity to present technical evidence if so desired.
8. Where presently platted or mapped regulatory floodplain and erosion hazard areas are different than previously approved regulatory floodplain and erosion hazard areas, the most recent information shall apply.

ARTICLE VII

PERMITS; PENALTY

A. Floodplain Use Permit Required

1. From the effective date of this Ordinance it shall be unlawful to cause or allow any development to occur on any land within the regulatory floodplain as described in Articles VIII and IX of this ordinance, or within erosion hazard areas as described in Article XII of this Ordinance, without first applying for and obtaining a Floodplain Use Permit from the County Engineer, and thereafter complying with each and every written term of the permit. However, no such Floodplain Use Permit shall be required for any repairs or alterations for which the value of the materials and labor thereon does not exceed \$1500.00 except for those improvements which obstruct the flow of flood water. For the purpose of determining the value of any such repairs or alterations, the normal retail value of materials and the reasonable value of the labor performed shall be used. Although no Floodplain Use Permit is required, all other provisions of this Ordinance shall be observed in the performance of said repairs or alterations. Repairs or alterations shall not be done in a piecemeal fashion for the purpose of avoiding applying for a permit when the total cost of said work is in excess of \$1500.00.
2. Every new structure, building, fill, excavation or development located or maintained within any regulatory floodplain or erosion hazard area in violation of this Ordinance and without written authorization from the Floodplain Management Board is a public nuisance per se and may be abated, prevented or restrained by action of the State or any political subdivision of the State.
3. In addition to other penalties or remedies otherwise provided by law, the State of Arizona, any political subdivision thereof, or any person who may be damaged as a result of the diversion, retardation or obstruction of water within

the regulatory floodplain, shall have the right to commence, maintain and prosecute any appropriate action or pursue any remedy to enjoin, abate or otherwise prevent any person from violating or continuing to violate any provision of this Ordinance. If any person is found to be in violation of any provision of this Ordinance, the court shall require the violator to comply with this Ordinance or remove the obstruction and restore the floodplain to its original condition.

4. As a further remedy, Pima County may withhold the issuance of building permits or Floodplain Use Permits for any development or improvement on the same parcel, or on a contiguous parcel of land under the same ownership, where any improvement or development on the property is not in compliance with this Ordinance or any other provision of law relating to that development.

B. Issuance of Permits

1. It shall be the duty of the County Engineer through the Floodplain Management Section of the Pima County Department of Transportation and Flood Control District to issue the Floodplain Use Permits required by this article. The County Engineer may request and shall receive, so far as may be necessary in the discharge of his duties, the assistance and cooperation of all departments, agencies, officials and public employees of Pima County in the enforcement of this Ordinance. No license, permit or other similar approval for any development which would be in conflict with the provisions of this Ordinance shall be issued by any department, official or employee of Pima County; and any such license, permit or approval, if issued in conflict with the provisions of this Ordinance, shall be null and void.
2. The District shall advise any city or town which has assumed jurisdiction over its regulatory floodplains in accordance with Arizona Revised Statute No. §48-3610 in writing and provide a copy of any development plan or any application which has been filed with the County for a Floodplain Use Permit or variance to develop land in a regulatory floodplain, floodway or erosion hazard area within one mile of the boundary between the District's area of jurisdiction and the jurisdiction of that city or town. The District shall also advise any city or town in writing and provide a copy of any development plan

of any major development proposed within a regulatory floodplain, floodway or erosion hazard area which could affect regulatory floodplains, floodways, erosion hazard areas or watercourses within that city's or town's area of jurisdiction. Written notice and a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three working days after having been received by the District.

C. Permit Procedures

1. Upon receiving an application for a Floodplain Use Permit, the County Engineer may require, where applicable, the applicant to submit the following:
 - a. Plans in triplicate, drawn to scale showing the nature, location, dimensions and elevation of the lot, existing or proposed structure, fill, storage of materials, flood proofing measures and the relationship of the above to the location of the channel, regulatory floodplain, floodway and erosion hazard area boundaries and the regulatory flood elevation. All elevations or vertical distances must reference an established datum or base elevation.
2. Where special circumstances necessitate more detailed information, the applicant must furnish any or all of the following as is deemed necessary by the County Engineer for the evaluation of the effects of the proposed use upon flood flows and other factors necessary to render a decision on the suitability of the proposed use:
 - a. One or more cross-sections showing the existing channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development, and high water information (if available).
 - b. Plan (surface view) showing elevations or contours of the ground; pertinent structures, fill, or storage elevations; size, location and spatial arrangement of all proposed and existing structures and channel banks on the site; location and elevation of streets, water supply, sanitary facilities; photographs showing existing land uses and vegetation upstream and downstream, soil types, and other pertinent information.

- c. Profile showing the elevation and slope of the bottom of the channel or flow line of the stream or watercourse.
 - d. Specifications for building construction and materials, flood proofing, filling, excavating, channel improvements, storage of materials, water supply, and sanitary facilities.
 - e. An engineering study prepared by an Arizona Registered Professional Civil Engineer outlining the effects the development will have on the flow of water through the area being developed and the surrounding areas. This study will be for the purpose of evaluating possible flood hazards and shall, where necessary, include consideration of the effects of the development on flood heights, water velocities, direction of flow, sedimentation and/or erosion, volume of flows, channel shape and size, type of channel banks and other items that may be pertinent, and the resultant effects on structures, land, banks, etc. for the adjacent regulatory floodplain and the surrounding area.
3. The Pima County Engineer shall review the proposed development to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1134.

D. Denial of Permit

No permit shall be issued for any development which is not in conformance with this Ordinance or any other provision of law relating to such development. A Floodplain Use Permit may be denied if the proposed development constitutes a danger or hazard to life or property. In making such a determination the County Engineer shall consider the following factors:

1. The danger to life, person, or property due to increased flood heights, velocities, or redirection of flow caused by the development.
2. The danger that materials may be swept on to other lands.

3. The proposed water supply and sanitation systems of any development and the ability of these systems to prevent disease, contamination and unsanitary conditions if they should become flooded or eroded.
4. The susceptibility of the proposed development or its contents to flood or erosion damage and the effect of such damage on the individual owners.
5. The availability of alternative locations for the proposed use on the same property which are not subject to flooding or erosion.
6. The compatibility of the proposed use with existing regulatory floodplain uses and with floodplain management programs anticipated in the foreseeable future.
7. The relationship of the proposed use to any comprehensive plan and floodplain management program for the area.
8. The access to the property line in times of flood for conventional and emergency vehicles.
9. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site under both existing and proposed conditions.
10. Documentation that all necessary permits have been obtained from State and Federal agencies.
11. Such other factors which are relevant to the purposes of this Ordinance.

E. Conditions

Any Floodplain Use Permit may be subject to conditions or restrictions designed to reduce or mitigate the potential danger or hazard to life or property resulting from development within the regulatory floodplain, floodway or erosion hazard areas. The applicant may be required to execute deed restrictions running with the land or be required to post performance bonds, assurances or such other security as may be

appropriate and necessary to assure the performance of the conditions or restrictions that may be imposed. Examples of conditions that may be imposed include, but are not limited to, the following:

1. Modification of waste disposal and water supply facilities.
2. Limitations on periods of use and hours of operation.
3. Institution of operation controls.
4. Requirements for construction of channel modifications, dikes, levees and other protective measures.
5. Indemnification agreements whereby the applicant agrees to hold Pima County, the Pima County Flood Control District, and the Floodplain Management Board and their officers, employees and agents, harmless and defend them from any and all claims for damages now and in the future relating to the use of the property sought to be developed by reason of flooding, flowage, erosion or damage caused by water whether surface, flood or rainfall.
6. Flood proofing measures for non-residential structures, such as the following, which shall be designed to be consistent with the regulatory flood elevation for the particular area, flood velocities, durations, rate of rise, hydrostatic and hydrodynamic forces, and other factors associated with the base flood. The Floodplain Management Board may require that the applicant submit a plan or document certified by an Arizona Registered Professional Civil Engineer that the flood proofing measures are consistent with the regulatory flood elevation and associated flood factors for the particular area. Examples of flood proofing measures that may be required include, but are not limited to:
 - a. Anchorage to resist flotation and lateral movement.
 - b. Installation of watertight doors, bulkheads, and shutters.
 - c. Reinforcement of walls to resist water pressures.

- d. Use of paints, membrane, or mortars to reduce seepage of water through walls.
- e. Addition of mass or weight to structures to resist flotation.
- f. Installation of pumps to lower water levels in structures.
- g. Construction of water supply and waste treatment systems so as to prevent the entrance of flood waters.
- h. Pumping facilities for subsurface external foundation wall and basement floor pressures.
- i. Construction designed to resist rupture or collapse caused by water pressure or floating debris.
- j. Cut-off valves on sewer lines or the elimination of gravity flow basement drains.
- k. Elevation of structures or uses.
- l. Bank protection or armor plating on any proposed fill.

F. Penalty

Any person who fails to obtain the permit required by this article or who fails to comply with the terms and conditions of said permit shall be guilty of a Class 2 misdemeanor.

G. Revocation of Permit

For failure to comply with the terms of the Floodplain Use Permit, Pima County shall be entitled to revoke the Floodplain Use Permit upon written notice by registered mail or personal delivery to the applicant citing the reasons for

revocation. The person holding the Floodplain Use Permit may request a hearing before the County Engineer, where the merits of and reasons for revoking the permit are heard, within ten working days from the receipt of notice or personal delivery. After considering the issues and facts presented during the hearing the County Engineer may revoke a previously issued Floodplain Use Permit. If no request for a hearing is made within ten working days from the receipt of notice or personal delivery, the permit shall be considered revoked. The applicant or any affected party may appeal the decision of the County Engineer by requesting a hearing before the Floodplain Management Board in accordance with Article XVI of this Ordinance.

H. Removal of Violation

Upon written notice, the County Engineer may cause any structure, encroachment or work constructed without a Floodplain Use Permit, or which is in violation with the terms of a permit, to be removed immediately at the expense of the person who caused the structure, encroachment or work if said structure, encroachment or work will cause an immediate danger to life and property.

I. Recovery of Costs

Pima County shall be entitled to recover all costs, administrative, engineering and legal, as well as actual costs to remove or modify the structure, encroachment and any other work in violation of this Ordinance.

J. Certification

Prior to either the pouring of the first slab or the finished floor inspection, the applicant shall submit to the County Engineer certification of elevation in compliance with the provisions of the Floodplain Use Permit prepared by an Arizona Registered Land Surveyor. Such certification shall be maintained in the Floodplain Management Section of the Pima County Department of Transportation and Flood Control District.

ARTICLE VIII

FLOODWAY REQUIREMENTS

A. Uses Allowed

Except as provided for in this article, no other use shall be allowed in any floodway. The following open space uses shall be permitted within a floodway to the extent that they are not prohibited by any provision of this Ordinance or any other ordinance, law or regulation, and provided they do not require fill, excavation, or the storage of materials or equipment:

1. Agricultural uses, including general farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, sod farming, and wild crop harvesting.
2. Industrial-commercial uses such as loading areas, airport landing strips, parking areas.
3. Private and public recreational uses, including golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, parks, wildlife and nature preserves, game farms, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, hiking and horseback riding trails.
4. Accessory residential uses, including lawns, gardens, parking areas and play areas.

B. Excavations; Including Sand and Gravel Operations

Sand and gravel excavations, including proposed operations and existing operations subject to permit renewal, are subject to the following:

1. Extraction of sand, gravel, and other materials is allowed within a floodway provided that excavations are not so located nor of such depth, or width, or length, or combination of depth-width-length as to present a hazard to

structures (including but not limited to roads, bridges, culverts, and utilities), to the banks of watercourses, to other property, or which adversely affect groundwater recharge.

2. Within a floodway there shall be no stockpiling of materials or tailings that may obstruct, divert, or retard the flow of floodwaters except as reviewed and approved by the Pima County Engineer on an individual Floodplain Use Permit basis.
3. Excavations may be allowed only in those reaches of watercourses which have, at a minimum, a balanced sediment system, i.e. the sediment coming into the reach is equal to or greater than the sediment leaving the reach and the long term sediment balance for the entire river system indicates that the stream channel will aggrade.
4. Due to the rapidly changing hydraulic characteristics of watercourses in Pima County, and the effects excavations have on these characteristics, Floodplain Use Permits for excavations shall only be issued for a limited time period, not to exceed one year, subject to annual renewal upon review by the County Engineer.
5. In addition to those conditions provided for elsewhere, Floodplain Use Permits for excavations may impose conditions regarding the area and location in which excavations are allowed, the maximum amount of material to be excavated, and other reasonable restraints on the methods of operating, including time restraints.
6. Any extraction of sand and gravel or related materials in a floodway shall be allowed after the effective date of this Ordinance only if a reclamation plan is also provided for the extraction operation. The reclamation plan shall show in sufficient detail the actions which are proposed to reclaim the excavated areas so that all adverse effects of extraction are mitigated. The plan shall also contain a timetable and financial assurances for accomplishing reclamation.
7. The County Engineer may require bonds or other financial assurances appropriate for the sand and gravel extraction operation.

8. The County Engineer may require hydrologic, hydraulic and geomorphic analyses addressing the existing conditions as well as the impacts under the proposed method of operation.
9. The Floodplain Management Board may grant variances as provided by Article XVII of this Ordinance.

C. Limitations

No use shall be allowed which:

1. Acting alone or in combination with existing or future uses creates danger or hazard to life or property. In determining whether a use creates a danger or hazard to life or property, the County Engineer may require a certification by an Arizona Registered Professional Civil Engineer that the proposed use will not result in any increase in the floodway elevations during the occurrence of the base flood, nor will the proposed use divert, retard or obstruct the flow of flood waters.
2. Increases the floodway elevations.
3. Adversely affects groundwater recharge.
4. Increases erosion potential upstream and/or downstream.
5. Places a waste disposal system wholly or partially in a floodway.

D. Flood Control Structures

Flood control structures designed to protect life or property from the dangers or hazards of floodwaters are permitted provided all other provisions of this Ordinance are met.

ARTICLE IX

FLOODWAY FRINGE AREA REQUIREMENTS

A. Uses allowed

Any use to the extent not prohibited by this Ordinance or any other ordinance or law is allowed within the floodway fringe area.

B. General conditions

The following general conditions shall apply to all uses within the floodway fringe area. No development, storage of materials or equipment, or other uses shall be permitted which, acting alone or in combination with existing or future uses, create a danger or hazard to life or property. Consideration of the effects of a proposed use or development shall be based on the assumption that there will be an equal degree of encroachment extending for a significant reach on both sides of the watercourse.

1. Fill

- a. Any fill proposed to be deposited in the floodway fringe must be shown to have some beneficial purpose and the amount thereof not greater than is necessary to achieve that purpose, as demonstrated by a plan submitted by the owner showing the uses to which the filled land will be put and the final dimensions of the proposed fill or other materials.
- b. Such fill or other materials shall be protected against erosion by riprap, vegetative cover, bulk-heading, or other approved methods.

2. Structures

- a. Structures shall be constructed so as to offer the minimum obstruction to the flow of flood waters. Wherever possible, structures shall be

constructed with the same alignment as the direction of flood flow and so far as practicable shall be placed approximately on the same alignment as those of adjoining structures.

- b. All structures shall be firmly anchored to prevent their flotation, which might otherwise result in damage to other structures or restriction of bridge openings and other narrow sections of the watercourse.
- c. Service facilities such as electrical and heating equipment shall be constructed at or above the regulatory flood elevation for the particular area or be adequately flood proofed.
- d. Any structure designed or utilized for human habitation, whether full or part time, shall have the lowest floor elevated at or above the regulatory flood elevation. Prior to the pouring of the first slab or finish floor inspection the applicant shall submit to the County Engineer certification by an Arizona Registered Land Surveyor that the elevation of the lowest floor is in compliance with the Floodplain Use Permit.
- e. Enclosed areas within the regulatory floodplain and below the regulatory flood elevation shall be designed to equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters.
- f. If fill is used to elevate any structure, the minimum elevation of the fill shall be at or above the base flood elevation and shall extend at such elevation for a distance of at least twenty-five feet beyond the outside limit of the structure unless a study/analysis prepared by an Arizona Registered Professional Civil Engineer demonstrates that a lesser distance is acceptable.
- g. Structures designed or utilized for human habitation, whether full or part time, shall only be permitted where the product of the flow depth d , in feet, times the square of the flow velocity v , in feet per second, of the surrounding floodwaters of the base flood does not exceed the numerical value of eighteen ($dv^2 \leq 18$) for a period in excess of thirty minutes, and the surrounding floodwaters of the base flood do not exceed three feet in depth .

3. Storage of Materials and Equipment

- a. The storage and/or processing of materials that are buoyant, flammable, explosive or that could be injurious to human, animal or plant life in time of flooding is prohibited.
- b. Storage of other material or equipment may be allowed if it is not subject to major damage by floods and is firmly anchored to prevent flotation or is readily removable from the area within the limited time available after flood warning.

4. Utilities

- a. Water supply, water treatment, and sewage collection and disposal systems built in a regulatory floodplain shall be designed to prevent or minimize infiltration of floodwaters into these systems and discharge of materials from these systems into flood waters.
- b. On-site sanitary waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

5. Excavations; Including Sand and Gravel Operations

- a. Extraction of sand, gravel, and other materials is allowed within the floodway fringe and erosion hazard areas provided that excavations are not so located nor of such depth, or width, or length, or combination of depth-width-length as to present a hazard to structures (including but not limited to roads, bridges, culverts, and utilities), to banks or watercourses, to other property, or which adversely affect groundwater recharge.
- b. There shall be no stockpiling of material or tailings within the floodway fringe areas that may obstruct, divert, or retard the flow of floodwaters except as reviewed and approved by the Pima County Engineer on an individual Floodplain Use Permit basis.

- c. Due to the rapidly changing hydraulic characteristics of watercourses in Pima County, and the effects excavations have on these characteristics, Floodplain Use Permits for excavations shall only be issued for a limited time period, not to exceed one year, subject to annual renewal upon review by the County Engineer.
- d. In addition to those conditions provided for elsewhere, Floodplain Use Permits for excavations may impose conditions regarding the area and location in which excavations are allowed, the maximum amount of material to be excavated, and other reasonable restraints on the methods of operation, including time restraints.
- e. Any extraction of sand and gravel or related materials in the floodway fringe or erosion hazard areas shall be allowed after the effective date of this Ordinance only if a reclamation plan is also provided for the extraction operation. The reclamation plan shall show in sufficient detail the actions which are proposed to reclaim the excavated areas so that all adverse effects of extraction are mitigated. The plan shall also contain a timetable and financial assurances for accomplishing reclamation.
- f. The County Engineer may require bonds or other financial assurances appropriate for the sand and gravel extraction operation.
- g. The County Engineer may require hydrologic, hydraulic and geomorphic analyses addressing the existing conditions as well as the impacts under the proposed method of operation.
- h. The Floodplain Management Board may grant variances as provided by Article XVII of this Ordinance.

ARTICLE X

STANDARDS FOR MANUFACTURED HOMES AND MANUFACTURED HOME PARKS AND SUBDIVISIONS

A. Permit Required

From the effective date of this ordinance it shall be unlawful to place a manufactured home within a regulatory floodplain, as described in Articles VIII and IX of this Ordinance, or erosion hazard areas as described in Article XII of this Ordinance, for more than 180 consecutive days without first applying for and obtaining a Floodplain Use Permit from the County Engineer, and thereafter complying with each and every written term of the permit. However, no such Floodplain Use Permit shall be required for any repairs or alterations for which the value of the materials and labor thereon does not exceed \$1500.00 except for those improvements which obstruct the flow of floodwaters. For the purpose of determining the value of any such repairs or alterations, the normal retail value of materials and the reasonable value of labor performed shall be used. Although no Floodplain Use Permit is required, all other provisions of this Ordinance shall be observed in the performance of said repairs or alterations. Repairs or alterations shall not be done in a piecemeal fashion for the purpose of avoiding applying for a permit when the total cost of said work is in excess of \$1500.00.

B. General Provisions

All manufactured homes and additions to manufactured homes located within a regulatory floodplain or erosion hazard area shall be anchored to resist flotation, collapse, or lateral movement by one of the following methods:

1. By providing an anchoring system designed to withstand horizontal forces of 25 pounds per square foot and uplift forces of 15 pounds per square foot; or
2. By providing over-the-top and frame ties to ground anchors. Specifically:

- a. Over-the-top ties be provided at each of the four corners of the manufactured home, with two additional ties per side at intermediate locations, except that manufactured homes less than fifty feet long require only one additional tie per side; and
- b. Frame ties be provided at each corner of the home with five additional ties per side at intermediate points, except that manufactured homes less than fifty feet long require only four additional ties per side; and
- c. All components of the anchoring system be capable of carrying a force of 4,800 pounds.

C. Application and Requirements:

Where:

- (a) manufactured homes not placed in manufactured home parks or subdivisions,
- (b) new manufactured home parks or subdivisions,
- (c) expansions to existing manufactured home parks or subdivisions and,
- (d) repair, reconstruction, or improvements to existing manufactured home parks or subdivisions that equal or exceed fifty percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced, are located within a regulatory floodplain or erosion hazard area, the following standards shall apply:
 1. Adequate surface drainage and access for a hauler shall be provided.
 2. All manufactured homes shall be placed on pads or lots elevated on compacted fill which shall be, at a minimum, at or above the base flood elevation or on a stem wall or on pilings so that the bottom of the structural frame or the lowest point of any attached appliances, whichever is lower, is at or above the regulatory flood elevation. If elevated on pilings:
 - a. The lots shall be large enough to permit steps;

- b. The pilings shall be placed in stable soil no more than ten feet apart and,
- c. Structures designed or utilized for human habitation, whether full or part time, shall only be permitted where the product of the flow depth d , in feet, times the square of the flow velocity v , in feet per second, of the surrounding floodwaters of the base flood does not exceed the numerical value of eighteen ($dv^2 \leq 18$) for a period in excess of thirty minutes, and the surrounding floodwaters of the base flood do not exceed three feet in depth.

D. Certification

Certification that the installation of a manufactured home meets all of the requirements of this section is required. Such certification shall be provided by the person installing the manufactured home, the owner, the developer of the manufactured home park or subdivision, or an agency regulating manufactured home placement, whichever is deemed appropriate by the County Engineer. Certification of elevations listed on the Floodplain Use Permit shall be prepared by an Arizona Registered Land Surveyor and provided to the County Engineer prior to habitation of the structure.

ARTICLE XI

SUBDIVISION AND DEVELOPMENT REQUIREMENTS

A. Suitability of Land

Land may not be parceled or subdivided in such a manner as to create lots unsuitable for development because of flood or erosion hazards.

B. Delineation on Plats and Development Plans of Areas Subject to Flooding and Erosion

1. All tentative plats and development plans submitted shall show location by survey, or photographic methods, of streams, watercourses, canals, irrigation laterals, private ditches, culverts, lakes and other water features, including those areas subject to flooding or erosion. The plats/plans shall also include the direction of any flow and drainage area, as well as water surface elevations and the limits of inundation for the base flood if such a flood has a peak flow rate equal to or greater than 100 cfs.
2. All tentative plats and development plans shall show proposed grading and improvements for areas which are subject to flooding or which have drainage problems, and shall also show a description and location of all facilities proposed to alleviate flooding or drainage problems within or outside the boundaries of the subdivision or development.
3. All development plans and tentative plats must be accompanied by conceptual grading plans and conceptual drainage improvement plans as necessary to demonstrate:
 - a. The methods for flood proofing and/or drainage control for the development including sufficient lot grading information to demonstrate adequate finished pad elevations and/or drainage slopes to protect building foundations.
 - b. That improvements are compatible with the existing upstream and downstream drainage conditions and that any proposed grading and/or grade change will not have an adverse impact on surrounding property.
 - c. The methods of erosion and sediment control.
 - d. The methods of mitigating increased urban peak and volumetric flood water runoff or discharge on downstream properties created as a result of the development.
4. Prior to commencement of any site improvements or grading, a grading plan must be submitted to the Pima County Department of Transportation and Flood

Control District for review and approval. Detailed improvement plans for storm drains or channel improvements must also be submitted to the same Department for review and approval.

5. All final plats and development plans shall indicate the limits of the regulatory floodplains, erosion hazard boundaries and the limits of the federally established regulatory floodplains and floodways (if applicable), and be delineated in a surveyable manner and certified by an Arizona Registered Land Surveyor.
6. All final plats shall indicate both the drainage areas and their respective base flood peak discharges, with a note contained on the final plat that the drainage areas and base flood peak discharges are provided by the owner only for information purposes.
7. The District shall advise any city or town which has assumed jurisdiction over its regulatory floodplains in accordance with Arizona Revised Statute 48-3610 in writing and provide a copy of any development plan or any application which has been filed with the County for a Floodplain Use Permit or variance to develop land in a regulatory floodplain or floodway within one mile of the boundary between the District's area of jurisdiction and the jurisdiction of that city or town. The District shall also advise any city or town in writing and provide a copy of any development plan of any major development proposed within a regulatory floodplain or floodway which could affect floodprone areas or watercourses within that city's or town's area of jurisdiction. Written notice of a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three working days after having been received by the District.

C. Street Elevations

Streets required for paved permanent access shall be designed and constructed so that the flow depths over them do not exceed one foot in depth during the base flood. At least one paved permanent access shall be provided to each lot over terrain which can be traversed by conventional motor vehicles in times of flooding. In specific instances at drainage crossings where it can be demonstrated that this requirement is either impractical, based upon low hazard to life and property, or where construction of a drainage crossing may create problems which override the

corresponding benefits; this requirement may be waived by the County Engineer. Fill may be used for streets in areas subject to flooding provided such fill does not unduly increase flood heights. The developers may be required to provide profiles and elevations of streets for areas subject to flooding.

D. Building Sites

Land which contains areas within a regulatory floodplain or erosion hazard area shall not be platted for residential occupancy or building sites unless each lot contains a building site, either natural or man-made, which is not subject to flooding or erosion by the base flood.

1. It is preferred that building sites be located outside of the regulatory floodplain.
2. In regulatory floodplain areas where fill is to be used to raise the elevation of the building site, the building shall be located not less than twenty-five feet landward from any edge of the fill unless a study/analysis prepared by an Arizona Registered Professional Civil Engineer demonstrates a lesser distance is acceptable. No fill shall be placed in any regulatory floodplain or floodway, nor shall any fill be placed where it diverts, retards or obstructs the flow of water to such an extent that it creates a danger or hazard to life or property.
3. Any dwelling unit built within a regulatory floodplain shall be constructed so as to place the minimum floor elevation of the dwelling unit at or above the regulatory flood elevation.

E. Setbacks from Channels

Along reaches of watercourses where hazards from eroding banks or channel meandering are considered by the County Engineer to be severe, special engineering studies prepared by an Arizona Registered Professional Civil Engineer shall be required of the property owner or developer and requirements for setbacks from banks of watercourses and/or other protection measures shall be established in accordance with those approved studies. Also see Article XII of this Ordinance.

F. Rights-of-Way for Drainage

Whenever a subdivision plat or development plan contains a watercourse which is regulated by this Ordinance, all right-of-way associated with the watercourse shall be designated "Drainageway".

1. If the watercourse is an improved major watercourse, the Drainageway shall include the channel, the channel improvements, and a fifty foot wide area measured outward from the front face of the top of the bank protection for Pima County or for Pima County Flood Control District uses.
2. If the watercourse is an improved minor watercourse, the Drainageway shall include the channel, the channel improvements, and necessary maintenance access.
3. If the watercourse is to remain natural, the Drainageway shall be the boundaries of the regulatory floodplain.
4. Along major watercourses where the peak discharge during the base flood is 10,000 cubic feet per second or greater, the Drainageway shall be dedicated in fee simple to the Pima County Flood Control District.
5. Along other watercourses, the County Engineer shall determine whether it is necessary for Pima County or the Pima County Flood Control District to have control of the Drainageway. If the County Engineer determines that public control is necessary, the owner shall dedicate the Drainageway in fee simple or grant an easement.

G. Detention/Retention Systems

(See Article XIV of this Ordinance.)

H. Fees and Public Cost Recovery for Drainage or Flood Control Improvements

The Floodplain Management Board may establish a cost recovery system or fee system for the improvement or installation of public flood control systems. The

purpose of the fee is to provide a method for off-site improvements necessary to mitigate the effect of urbanization and to provide a systematic approach for the construction of public flood control improvements. If such a system is adopted it shall demonstrate that the fee will in some manner benefit the property from which the fee is collected and be applied equitably to all property in proportion to floodwaters generated by urban use of the property. The fees will also be restricted to providing flood control improvements necessary for the allowed use of the properties from which the fee is collected, and the fees shall be reasonably related to the actual cost of providing flood control improvements beneficial to the site or surrounding area. The fees will be reviewed by the Flood Control District Advisory Committee prior to action by the Board of Directors of the Pima County Flood Control District.

ARTICLE XII

EROSION HAZARD AREAS AND BUILDING SETBACK REQUIREMENTS

In erosion hazard areas where watercourses are subject to flow related erosion hazards, building setbacks are required as follows:

A. Major Watercourses

For major watercourses, with base flood peak discharges of 2,000 cfs or greater, the following building setbacks shall be required where approved bank protection is not provided:

1. Along the following major natural watercourses where no unusual conditions exist, a minimum building setback, as indicated below, shall be provided at the time of the development unless an engineering analysis which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. Unusual conditions include, but are not limited to, historical meandering of the watercourse, large excavation pits, poorly defined or poorly consolidated banks, natural channel armoring, proximity to stabilized structures such as bridges or rock outcrops, and changes in the direction, amount and velocity of the flow of waters within the watercourse.

- a. The building setback shall be five-hundred feet along the Santa Cruz River, Rillito Creek, Pantano Wash, Tanque Verde Creek and the Canada del Oro Wash downstream of the confluence with Sutherland Wash.
 - b. The building setback shall be two-hundred and fifty feet along major watercourses with base flood peak discharges greater than 10,000 cfs.
 - c. The building setback shall be one-hundred feet along all other major watercourses with base flood peak discharges of 10,000 cfs or less, but more than 2,000 cfs.
2. Along major watercourses where unusual conditions do exist, building setbacks shall be established on a case-by-case basis by the County Engineer, unless an engineering study which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. When determining building setback requirements the County Engineer shall consider danger to life and property due to existing flood heights or velocities and historical channel meandering. Unusual conditions include, but are not limited to, historical meandering of the watercourse, large excavation pits, poorly defined or poorly consolidated banks, natural channel armoring, proximity to stabilized structures such as bridges or rock outcrops, and changes in the direction, amount, and velocity of the flow of waters within the watercourse.

B. Minor Washes

For minor washes with a base flood peak discharge of 2,000 cfs or less, the following building setbacks shall be required where approved bank protection is not provided.

1. Along minor watercourses where no unusual conditions exist, a minimum setback of fifty feet shall be provided at the time of development unless an engineering analysis which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. Unusual conditions include, but are not limited to, historical

meandering of the watercourse, large excavation pits, poorly defined or poorly consolidated banks, natural channel armoring, proximity to stabilized structures such as bridges or rock outcrops, and changes in the direction, amount, and velocity of flow of the waters in the watercourse.

2. Along minor washes where unusual conditions do exist, building setbacks shall be established on a case-by-case basis by the County Engineer, unless an engineering study which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. When determining building setback requirements, the County Engineer shall consider danger to life and property due to existing flood heights or velocities and historical channel meandering.

ARTICLE XIII

ACCESS REQUIREMENTS

A. Purpose

It is recognized that private vehicular access may become impassable to ordinary and emergency vehicles during times of flooding. It is the intent of this Article to allocate the responsibility for private vehicular access which crosses a regulatory floodplain.

B. Application of Article

This Article shall apply in all situations where private vehicular access crosses any regulatory floodplain located between the point where the private access leaves a paved, publicly maintained roadway and the end of the private access.

C. Requirements for Private Vehicular Access

In all situations where private vehicular access crosses a regulatory floodplain located between the point where the private access leaves a paved, publicly

maintained roadway and the end of the private access, the owner of the property requiring the private vehicular access shall:

1. Construct a private vehicular access in such a manner that it is permanent and is over terrain which can be traversed by conventional motor vehicles during a base flood; or
2. Execute and record a covenant running with the land enforceable by Pima County and the Pima County Flood Control District which contains the following:
 - a. An acknowledgement that the private vehicular access may be impassable to conventional motor vehicles and emergency vehicles in times of flooding,
 - b. A hold harmless provision, holding Pima County and the Pima County Flood Control District harmless from and against all injuries and damages resulting from traversing or attempting to traverse the private vehicular access during times of flooding, and
 - c. A provision which either:
 - (1) Requires the covenantor, successors and assigns to erect and maintain a sign(s) in a location(s) and size(s) acceptable to the Pima County Department of Transportation and Flood Control District stating "DO NOT ENTER WHEN FLOODED"; or
 - (2) Causes the covenantor, successors and assigns to assume responsibility to notify users of the private vehicular access that it may be impassable in times of flooding and agreeing to indemnify and defend Pima County, the Pima County Flood Control District, their officers, employees, servants and agents, against all claims for injuries to persons or damages to property due to the construction, installation, location, operation, safeguarding, maintenance, repair and condition of the private vehicular access.

ARTICLE XIV

DETENTION/RETENTION SYSTEMS

All proposed residential densities of three or more units per acre and all proposed commercial and industrial developments greater than one acre in size shall provide some method of peak or volumetric runoff reduction. The amount of reduction is stipulated within the Stormwater Detention/Retention Manual. The Stormwater Detention/Retention Manual approved for use by the Board of Supervisors as of the effective date of this ordinance is made a part of this ordinance. Any revisions to the Stormwater Retention/Detention Manual will be reviewed by the Flood Control District Advisory Committee.

A. Balanced and Critical Basins

Balanced and critical drainage basins which have been identified by the County Engineer as unsuitable for added development because of the high probability of increased flooding, or flooding of existing improvements or property not previously flooded, or ponding of flood water, may be developed further only upon the incorporation of adequate detention/retention systems or flood control facilities as reviewed and approved by the County Engineer. Drainage basins which have not been previously identified as unsuitable for additional urban development but upon any study are so identified shall be subject to the provisions of this Article. These detention or retention systems or flood control facilities shall be incorporated into any and all future basin development proposals regardless of size or land use density.

B. Alternative Improvements

Structural flood control measures may be proposed in conjunction with or in place of detention/retention systems if it can be clearly demonstrated that such measures will not alter the water and sediment equilibrium of the affected watercourse and will mitigate environmental impacts.

Appropriate structural flood control measures, such as channelization to a logical conclusion downstream of the proposed development and/or improvements to existing off-site flood control systems within the effected drainage or stream reach, shall be completed in accordance with plans reviewed and approved by the County Engineer.

C. Fees in Lieu of Detention/Retention Requirements

A fee may be utilized in place of a detention/retention system when it can be clearly demonstrated that detention at the site does not provide off-site flood relief due to the parcel size, location within the drainage basin, or other factors. The fees collected will be used to construct public flood control improvements which will mitigate the potential damage of flood waters originating from the property contributing the fees. In balanced and critical basins, and where development is less than three units to the acre, use of a fee system will be encouraged in lieu of a detention system in order to preserve the natural drainage patterns.

D. Balanced and Critical Basin Map

The County Engineer shall prepare and retain for public inspection and use an official map designating balanced and critical basins within Pima County.

ARTICLE XV

SEDIMENT AND EROSION CONTROL

A. Grading

Any grading or alteration of any watercourse regulated by this Ordinance shall be controlled to minimize the loss of soil through erosion from rainfall or storm water flowage. Methods to control erosion and sedimentation must be demonstrated to the satisfaction of the County Engineer prior to the granting of a Floodplain Use Permit for any work in any floodplain. Both temporary and permanent measures for sediment and erosion control must be clearly delineated on plans or other written documents prior to receiving a Floodplain Use Permit. The Grading Design Manual prepared pursuant to Chapter 18.81 of the zoning code shall be used to prepare these plans or documents.

B. Soil Investigations

The County Engineer may require appropriate soil investigation reports for the purpose of determining the erosive properties of areas or lands to be graded or disturbed which may create sediment deposition or erosion in any watershed regulated by this Ordinance.

C. Applicability

Any activity which may have an effect on the flood water carrying capacity of any watercourse regulated by this Ordinance is subject to the provisions of this Article.

ARTICLE XVI

APPEALS

A. Appeals Process

Any property owner appealing any written decision concerning the interpretation or administration of this Ordinance shall first appeal in writing to the County Engineer who shall make a written response within fifteen working days of receipt of the appeal. Within 10 working days of receipt of the written appeal the County Engineer may hold hearings and request such additional information as he deems necessary in order to render his written decision.

Any property owner aggrieved by the written decision of the County Engineer may file with the Clerk of the Board a written appeal which shall be heard by the Floodplain Management Board.

B. Procedures for Public Hearing

1. The Floodplain Management Board shall hold a public hearing concerning the appeal within forty-five days after the written appeal is received by the Clerk of the Board.

2. The appeal shall contain a detailed explanation of all matters in dispute and the Floodplain Management Board, through the County Engineer, may require the submission of such additional information as it deems necessary.
3. The Floodplain Management Board shall render its decision within thirty days of the close of the hearing.
4. The Floodplain Management Board may meet monthly or at such times as it deems necessary for the transaction of business including the hearing of appeals.
5. The Floodplain Management Board may refer matters of a highly technical nature, where an appeal is made to the Floodplain Management Board for interpretation, to a technical review board which shall make findings and recommendations to the Floodplain Management Board for decision. The technical review board shall consist of three Arizona Registered Professional Civil Engineers, one named by the County Engineer, one named by the appellant, and one named by the first two members. This review board shall not be permanent in nature, but shall be formed as required to hear individual appeals.

ARTICLE XVII

VARIANCES

A. Authorization

The Floodplain Management Board shall hear and decide all requests for variances from the requirements of this Ordinance to the extent permitted by A.R.S. §48-3609. A variance is subject to conditions to ensure that the variance does not constitute a grant of special privileges inconsistent with the limitations on similar property in a regulatory floodplain or erosion hazard area.

B. Requirements for a Variance

Variations shall only be issued if the Floodplain Management Board makes the following five determinations:

1. A determination that the variance is the minimum necessary, considering the flood hazards to afford relief;
2. A determining of good and sufficient cause;
3. A determination that failure to grant the variance would result in exceptional hardship to the applicant; and
4. A determination that the granting of the variance will not create a danger or hazard to persons or property in a regulatory floodplain or erosion hazard area in the area of jurisdiction or result in increased flood heights, additional threats to public safety, the creation of a nuisance, the victimization of or fraud on the public, or that the variance is not in conflict with other local laws or ordinances.
5. Special circumstances, such as size, shape, topography, location or surroundings of the property, would cause strict application of the regulations to deprive the property of the privileges enjoyed by similar property in a regulatory floodplain or erosion hazard area. A variance is subject to conditions to ensure that the variance does not constitute a grant of special privileges inconsistent with the limitations on similar property in the regulatory floodplain.

C. Covenants

Upon granting of a variance, permit or waiver for the construction of a dwelling unit or commercial of industrial structure, where the construction of such unit or structure is otherwise contrary to this Ordinance, the Floodplain Management Board shall provide written notice to the grantees of such a variance, permit, or waiver that, if the structure is a dwelling unit or business as defined by A.R.S. §26-321, the land upon which the structure is located is ineligible for exchange of state land

pursuant to the flood relocation and land exchange program provided for by Title 26, Chapter 2, Article 2 (A.R.S. §26-321 *et seq.*). A copy of the notice shall be recorded by the Floodplain Management Board in the office of the County Recorder and shall be recorded in manner so that it appears in the chain of title of the affected parcel of land.

D. Notification of Adjacent Jurisdictions

The District shall advise any city or town which has assumed jurisdiction over its regulatory floodplains in accordance with A.R.S. §No. 48-3610 in writing and provide a copy of any development plan or any application which has been filed with the County for a Floodplain Use Permit or variance to develop land in a floodplain or floodway within one mile of the boundary between the District's area of jurisdiction and the jurisdiction of that city or town. The District shall also advise any city or town in writing and provide a copy of any development plan of any major development proposed within a regulatory floodplain or floodway which could affect regulatory floodplains, floodways or watercourses within that city's or town's area of jurisdiction. Written notice and a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three working days after having been received by the District.

ARTICLE XVIII

AMENDMENTS

A. Public Hearing Process

This Ordinance may be amended only after a public hearing at which parties in interest and other citizens have an opportunity to be heard.

B. Petition for Amendments

The County Engineer or any affected person may petition for an amendment to this Ordinance and shall initiate such proceeding by filing with the Floodplain Management Board a proper and complete petition for such change on the form or forms provided by the Floodplain Management Board.

1. Staff Report: Upon receipt of such petition the County Engineer, with the assistance, advice and counsel of the County Zoning Inspector and the County Planning Director, shall make a study and report the findings to the Floodplain Management Board. The report shall be made available to the applicant and other interested parties at least thirty days before the date of any public hearing for the respective petition.

2. Floodplain Management Board Action: Upon receipt of the County Engineer's report and recommendation the Floodplain Management Board shall hold a public hearing thereon at which petitioner and other parties in interest have an opportunity to be heard. At least thirty days prior to the hearing, a notice of the time and place of hearing shall be published in a newspaper of general circulation within the area of jurisdiction of the Floodplain Management Board; or, if no newspaper of general circulation is regularly published within the area of jurisdiction, a newspaper of general circulation regularly published nearest the area of jurisdiction. A notice of any hearing accompanied by a copy of each of the proposed amendments shall be furnished to the Director of the Arizona Department of Water Resources at least thirty days prior to the date of such hearing. A copy of any amendment adopted by the Floodplain Management Board shall within five days thereafter be filed with the Director of the Arizona Department of Water Resources.

ARTICLE XIX

UNLAWFUL ACTS, PENALTY

A. Unlawful Acts

It is unlawful for any person to divert, retard or obstruct the flow of waters in a regulatory floodplain whenever such actions create a hazard to life or property without first securing the permit required by any provision of this Ordinance.

B. Penalty

Any person or entity violating the provisions of this Ordinance shall be guilty of a class 2 misdemeanor.

ARTICLE XX

MISCELLANEOUS

A. Cooperative Agreements and Consultants

The Floodplain Management Board may retain consultants and experts and may enter into cooperative agreements for the delineation of regulatory floodplains, floodways, and erosion hazard areas, or for such other assistance and guidance considered appropriate and necessary.

B. Severability

This Ordinance and the various parts thereof are hereby declared to be severable. Should any section or paragraph of this Ordinance be declared by the court to be unconstitutional or invalid, such decision shall not affect the validity of the Ordinance as a whole, or any portion thereof, other than the section or paragraph declared to be unconstitutional or invalid.

C. Units of Measure

All units of measure contained in this Ordinance, whether expressed or implied, are intended to be in the English system of units.

ARTICLE XXI

EFFECTIVE DATE:

Sec. 2001: This Ordinance shall become effective on December 6, 1988.

PASSED AND ADOPTED by the Board of Supervisors of Pima County, Arizona,
this 6th day of December, 1988.

PIMA COUNTY BOARD OF SUPERVISORS

Joris O. Devoherst
Chairman

ATTEST:

Jane Williams
Clerk, Board of Supervisors

APPROVED AS TO FORM:

John R. Neubauer
Deputy County Attorney
Civil Division

William Housler
Director, Chief Engineer and County Engineer
Pima County Department of Transportation
and Flood Control District

APPENDIX 1

TABLE OF REGULATORY PEAK DISCHARGES

Note: List is not all inclusive; remaining watersheds are also subjected to Pima County Floodplain Management Ordinance Restrictions. Listed discharges are subject to review and revision due to urbanization and improvements; check with Floodplain Management Section staff before their use.

	<u>REGULATORY</u>	<u>DESIGN¹</u>
Agua Caliente Wash		
@ Tanque Verde Wash	13,000	18,000
@ Soldier Canyon	12,000	17,000
@ Molino Canyon	9,000	14,000
above La Milagrosa Canyon	4,966	
Airport Wash		
@ Santa Cruz River	8,100	13,100
@ Alvernon Road	7,090	
Ajo Wash		
@ .5 miles west of La Cholla and Ajo	2,938	
Alamo Wash		
@ Ft. Lowell	8,235	
Anklam Wash		
@ Anklam Road	3,461	
Attebury Wash		
@ Stella Road	4,168	

¹Unless otherwise noted, design discharges shall be 20 percent greater than regulatory discharges.

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN</u> ¹
Attebury Wash		
@ Stella Road	4,168	
Big Wash		
@ Canada del Oro	18,300	23,300
@ Honey Bee Wash	16,900	21,900
Black Wash		
@ Ajo - Benson Highway	8,872	
@ Valencia	8,430	
Blanco Wash		
@ Los Robles Wash	17,000	22,000
Bowes Wash		
@ Tres Lomas Wash	2,006	
Brawley Wash		
@ Los Robles Wash	35,000	40,000
Caliente Hills Wash		
@ National Forest	2,899	
@ Agua Caliente Wash	2,473	
Camino del Oeste Wash		
@ Santa Cruz River	6,747	
Camino Real Wash		
@ Rillito Creek	2,516	
Campbell Wash		
@ Rillito Creek	2,899	

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN</u> ¹
Canada Wash		
@ Mission Road	782	
Canada del Oro Wash		
@ Santa Cruz River	28,000	33,000
@ Big Wash	21,000	26,000
@ Sutherland Wash	17,500	22,500
Canyon del Salto Wash		
@ Tanque Verde Wash	6,190	
Carmack Wash		
@ Hardy Road	5,595	
@ Thornydale Road	4,980	
Casas Adobes Wash	3,252	
Castle Rock Wash		
@ Tanque Verde Road	2,148	
Christmas Wash		
@ Rillito Creek	4,500	
Cienega Creek		
@ Pantano	18,000	28,000
Citrus Wash		
@ Roller Coaster Road	1,562	
Craycroft Wash		
@ Rillito	4,228	
@ Center Village Drive	4,130	

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN¹</u>
Cuprite Wash @ Fagan Wash	3,171	
Dakota Wash @ Mission Road	4,190	
Davidson Canyon Wash @ Vail	19,000	
Deep Well Ranch Wash @ Redington Road	770	
Dodge Tank Wash @ Canada del Oro Wash	11,004	
Enchanted Hills Wash @ Mission Road	4,054	
Esperero Wash @ Ventana Canyon Wash	8,440	
@ Sunrise Drive	9,116	
Fagan Wash (includes Cuprite Wash) @ Lee Moore Wash	7,817	
Ferreo Wash @ Tanque Verde Creek	968	
Finger Rock Wash @ Rillito River	5,779	
Flato Wash @ Lee Moore Wash	2,652	

(Appendix 1 continued)

REGULATORY

DESIGN¹

Flecha Caida Wash @ Swan Road	1,604
Flowing Wells Wash @ Ft. Lowell Road	5,698
Forty-Niners Wash @ National Forest Boundary	4,578
@ Tanque Verde Road	3,500
Franco Wash @ Santa Cruz River	6,388
Freeman Wash @ Tanque Verde Creek	2,467
@ St. James Road	2,785
Friendly Village Wash @ Rillito River	2,250
Fuller Wash @ Fuller Road	4,162

(Appendix 1 continued)

		<u>REGULATORY</u>	<u>DESIGN</u> ¹
<u>GREEN VALLEY DRAINAGEWAYS</u>		<u>Present</u>	<u>Future</u>
1	@ Santa Cruz River	732	873
2	"	564	
3	"	2,921	3,686
6	"	2,363	4,169
7	"	1,167	1,794
8	"	672	
9	"	3,043	4,292
10	"	108	
11	"	290	
12	"	117	
14	"	170	
15	"	42	
16	"	271	
17	"	1,718	1,973
18	"	210	
19	"	314	
20	"	440	
22	"	298	
23	"	892	910
24	"	1,160	1,207
25	"	1,150	1,189

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN¹</u>
Garfield Wash		
@ La Cholla Road	1,949	
Geronimo Wash		
@ Orange Grove Road	3,650	
Gibson Arroyo - Ajo, AZ		
@ 2nd Avenue	2,400	
@ Highway 85	3,990	
@ Rasmussen Road	5,100	
Golder Wash		
@ Confluence w/Sutherland	5,200	
Gunnery Range Wash		
@ Lee Moore Wash	5,736	
Hardy Wash		
@ Camino de Oeste Road	4,536	
Hughes Wash		
@ Hughes Access	2,416	
@ Old Nogales Highway	7,946	
@ Santa Cruz River	6,021	
Idle Hour East		
@ Santa Cruz River	9,257	
Idle Hour Wash		
@ Sunset Road	5,743	
Indian Hills Wash		
@ Bear Canyon Road	1,935	
@ Catalina Highway	1,340	

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN¹</u>
Julian Wash		
@ Ajo Gage	8,500	13,500
@ Wilmot Road	7,500	12,500
King Canyon Wash		
@ Kinney Road	3,902	
La Milagrosa Canyon		
above Agua Caliente Wash	3,892	
Lee Moore Wash		
@ Santa Cruz River	20,866	
Little Brawley Wash		
@ 32° 7' 25"		
111° 19' 45"	13,440	
Los Robles Wash		
@ Blanco Wash	37,000	42,000
Main Interceptor Channel		
@ DMAFB	5,450	
Mescal Arroyo		
@ Pantano Creek	12,000	
Monument Wash		
@ Speedway Road	9,495	
Mountain Wash		
@ Rillito Creek	450	
Nanini Wash		
@ Rillito Creek	3,071	

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN¹</u>
Old Granddad Tank Wash @ Redington Road	4,278	
Painted Hills Wash @ Ironwood/Greasewood Roads	3,848	
Pantano Creek @ Rillito Creek	32,000	37,000
@ Houghton Road	31,000	36,000
@ Rincon Creek	29,000	34,000
@ Vail	30,000	35,000
Pegler Wash @ Rillito Creek	4,000	
Petty Ranch Wash @ Lee Moore Wash	783	
Picture Rock Wash @ Picture Rocks Road	3,479	
Pima Wash @ Rillito Creek	5,300	10,300
@ Geronimo Wash	4,250	9,250
Pusch Ridge Wash @ Highway 89	2,803	
Race Track Wash @ Rillito Creek	2,100	
Rillito Creek @ Santa Cruz River	32,000	37,000

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN</u> ¹
Rincon Creek		
@ Pantano Creek	21,000	26,000
@ Coyote Wash	18,500	24,000
@ Sentinel	16,000	21,000
Rinconado Wash		
@ Redington Road	949	
Robb Wash		
@ Tanque Verde Creek	3,526	
Roller Coaster Wash		
@ Rillito Creek	2,300	
Rooney Wash		
@ Highway 89	3,960	
Sabino Creek		
@ Tanque Verde Creek	18,000	23,000
@ Bear Creek	12,500	17,500
Santa Cruz River		
@ Continental Road	45,000	55,000
@ Congress Road	60,000	70,000
@ Cortaro Road	70,000	80,000
San Pedro River		
@ Redington Road	50,000	70,000
Soldier Wash		
@ Soldier Trail Road	5,050	

(Appendix 1 continued)

	<u>REGULATORY</u>	<u>DESIGN</u> ¹
Sopori Wash @ Highway 89	19,900	24,900
South Interceptor Channel @ DMAFB	3,252	
Summit Wash @ Lee Moore Wash	874	
Sutherland Wash @ National Forest	12,800	
@ Catalina State Park	13,656	
Sycamore Canyon @ Lee Moore Wash	7,793	
Sweetwater Wash @ Silverbell Road	6,011	
Tanque Verde Wash @ Rillito Creek	34,000	39,000
@ Sabino Creek	28,000	33,000
@ Agua Caliente Wash	23,000	28,000
@ Canyon del Salto Wash	16,000	21,000
Tanuri Wash @ River Road	2,682	
Tanuri Wash (east branch) @ Tanuri Wash	1,131	

(Appendix 1 continued)

REGULATORY

DESIGN¹

Tortolita Fan

@ Canada Agua Canyon @ I-10	5,255	
Cochie Canyon @ I-10	5,779	
Cottonwood Canyon @ I-10	5,439	
Derrio Canyon @ I-10	5,229	
Eastern Limit of Fan @ I-10	4,084	
Guild Canyon @ I-10	4,561	
Ruelas Canyon @ I-10	4,604	
Unnamed Canyon @ I-10	4,340	
Wild Burro @ I-10	5,831	

Tres Lomas Wash

@ Tanque Verde Wash	4,379	
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Twenty-Seven Wash

@ Sec 3/4 T11 R14	3,796	
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Valley View Wash

@ River Road	3,947	
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Ventana Canyon Wash

@ Tanque Verde Creek	9,371	
Above Esperero Wash	11,082	
Below Esperero Wash	14,775	
@ Sunrise Drive	10,770	

Via Entrada Wash

@ Rillito Creek	2,500	
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West Branch Santa Cruz

@ Valencia Road	8,100	13,100
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(Appendix 1 continued)

REGULATORY

DESIGN¹

Wyoming Wash

@ Mission Road

2,235