

APPENDIX F

Preliminary Water Quality Management Plan
and
Preliminary Hydrology Report

Prepared by

The Altum Group
73-710 Fred Waring Drive, Suite 219
Palm Desert, CA 92260

December 3, 2018

Project Specific Preliminary Water Quality Management Plan

For: **Tentative Map 37639 – DSRT SURF**
Palm Desert, California 92260

Prepared for:

Desert Wave Ventures, LLC
PO Box 147
Solana Beach, CA 92075

Prepared by:

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12/3/18
Date
Exp. 12/31/18



WQMP Preparation Date: December 3, 2018

OWNER'S CERTIFICATION

This project-specific preliminary Water Quality Management Plan (WQMP) has been prepared for:

Desert Wave Ventures, LLC

by The Altum Group for the project known as DSRT SURF, located on Desert Willow Drive within the Desert Willow Golf Resort in the City of Palm Desert.

This Preliminary WQMP is intended to comply with the requirements of the City of Palm Desert and the requirements of the California Regional Water Quality Control Board MS-4 Permit for the Colorado River Region Basin for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Palm Desert ordinances.

If the undersigned transfers its interest in the subject property/project, the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that I am the owner of the property that is the subject of this WQMP, and that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

ATTEST

Owner's Signature

Owner's Printed Name

Owner's Title/Position

Date

Desert Wave Ventures, LLC
PO Box 147
Solana Beach, CA 92075

Notary Signature

Printed Name

Title/Position

Date

THIS FORM SHALL BE NOTARIZED BEFORE ACCEPTANCE OF THE FINAL PROJECT
SPECIFIC WQMP

December 3, 2018

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APPENDICES

- A. Conditions of Approval (See Final WQMP)
- B. Vicinity Map, WQMP Site Plan, and Receiving Waters Map
- C. Supporting Detail Related to Hydraulic Conditions of Concern
- D. Educational Materials
- E. Soils Report
- F. Site Design and Treatment Control BMP Sizing Calculations and Design Details (See attached Preliminary Hydrology Report)
- G. Agreements – CC&Rs, Covenant and Agreements and/or Other Mechanisms for ensuring ongoing Operation, Maintenance, Funding and Transfer of Requirements for this project-specific WQMP (See Final WQMP)
- H. Phase 1 Environmental Site Assessment - Summary of Site Remediation Conducted and Use Restrictions (not applicable)
- I. Project-Specific WQMP Summary Data Form

I. Project Description

Project Owner: Desert Wave Ventures, LLC
PO Box 147
Solana Beach, CA 92075

PWQMP Preparer: The Altum Group
73-710 Fred Waring Drive, Suite 219
Palm Desert, CA 92260
Telephone: (760) 346-4750

Project Site Address: The project is located on Desert Willow Drive within the Desert Willow Golf Resort in the City of Palm Desert.

Zoning and General Plan: PR – (Planned Residential)

Land Use Designation: Town Center Neighborhood, Resort and Entertainment

APN Number(s): 620-420-024, 620-420-023, 620-400-008

Thomas Bros. Map: Riverside Co. Pg. 818, Grid G2

Project Watershed: Whitewater River

Sub-watershed: N/A

Project Site Size: The total site area is approximately 17.8 acres;

Pervious/Impervious: The entire 17.8 acre will be disturbed during construction. The post-development impervious area is 16.0 acres (approximately 90%) of the site. A 6.0 acre Lagoon will be located on-site. Although the Lagoon is “impervious”, it does not contribute to runoff. Pervious area is 1.6 acres (approximately 10%) of the site.

Standard Industrial Classification (SIC) Code: 7999, Amusement and Recreation

Formation of Home Owners’ Association (HOA)

or Property Owners Association (POA): Y N

Additional Permits/Approvals required for the Project:

AGENCY	Permit required
State Department of Fish and Game, 1601 Streambed Alteration Agreement	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
-State Water Resources Control Board, Clean Water Act (-CWA) Section 401 Water Quality Certification	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
US Army Corps of Engineers, CWA Section 404 permit	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
US Fish and Wildlife, Endangered Species Act Section 7 biological opinion	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
City of Palm Desert - Building Permit	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>
City of Palm Desert - Grading Permit	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>
State Water Resources Control Board - Construction Stormwater General Permit (SWPPP and NOI)	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>
South Coast Air Quality Management District - PM10 Approval to comply with Rule 403	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>

Project Description:

The project applicant, Desert Wave Ventures, LLC, is proposing the construction of a surf themed recreation resort (“DSRT Surf”) within the existing Desert Willow resort development in Palm Desert, California. The project site consists of three Assessor’s Parcel Numbers (APNs): 620-420-023 (primary site, approximately 14.65 acres), 620-400-008 and 024 (both consisting of existing clubhouse parking lot or portions thereof). The development will include a Surf Lagoon and Surf Center, two-three story hotels and assorted Villas.

In general, Desert Willow is bounded by Cook Street and adjacent residential/commercial development to the east; Portola Avenue to the west; Country Club Drive to the south; and Frank Sinatra Drive to the north. The proposed project will be located south of the existing clubhouse with access off the Desert Willow Drive Roundabout. The proposed development will disturb all of the vacant parcel on which it is to be constructed. Under both existing and developed conditions, storm drain runoff generated on-site is designed to be conveyed to the adjacent South Golf Course within the Desert Willow development, per the original Desert Willow Resort drainage design. Portions of the existing South Golf Course are designated as drainage “waste” areas (Desert Willow South Golf Course Hydrology Report – February 12, 1997) where flows from all drainage areas within Desert Willow Resort can be diverted and collected either underground or into an existing lake where they are less likely to be visible on the ground surface. Flows exceeding the runoff storage capacity of the Desert Willow South Golf Course would be well in excess of the 100-yr storm and would exist the Resort onto an existing public street bordering the Resort site to the south, continuing easterly then southerly over public surface streets until reaching the Whitewater Storm Channel.

A relatively large (6.1 acres) Surf Lagoon is proposed as part of the development application. Although technically an impervious surface, rainfall tributary to the on-site Lagoon will not be directed off-site. Also, the proposed Surf Lagoon is designed to be evacuated frequently via a 16

inch gravity flow pipe that will convey water stored in the Lagoon to a South Golf Course lake within Desert Willow Resort.

Appendix A of the project-specific Final WQMP will include a complete copy of the final Conditions of Approval. Appendix B of this project-specific PWQMP includes:

- a. A Vicinity Map identifying the project site in sufficient detail to allow the project site to be plotted on Permittee base mapping; and
- b. A Site Plan for the project which typically includes the following project features:
 - Location and identification of all structural BMPs, including Treatment Control BMPs.
 - Landscaped areas.
 - Paved areas and intended uses (i.e., parking, sidewalks, etc.).
 - Number and type of structures and intended uses (i.e., buildings, etc.).
 - Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation.
 - Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins, drywells and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.
 - Location(s) of Receiving Waters to which the project directly or indirectly discharges.
 - Location of points where onsite (or tributary offsite) flows exit the property/project site.
 - Proposed drainage area boundaries, including tributary offsite areas, for each location where flows exit the property/project site. Each tributary area should be clearly denoted.
 - Pre- and post-project topography.

Appendix J to the PWQMP is a one page form that summarizes pertinent information relative to this project-specific WQMP.

II. Site Characterization

Land Use Designation or Zoning: Town Center Neighborhood, Resort and Entertainment
 PR – (Planned Residential)

Current Property Use: Vacant

Proposed Property Use: Commercial Recreation Resort

Availability of Soils Report: Y N *Note: A soils report is required if infiltration BMPs are utilized. Attach report in Appendix E.*

Phase 1 Site Assessment: Y N *Note: If prepared, attached remediation summary and use restrictions in Appendix H.*

Receiving Waters for Urban Runoff from Site

Receiving Waters	303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Whitewater River	None	MUN, AGR, GWR, REC 1, REC 2, WARM, COLD, WILD, POW	Not designated as RARE (2.5 mile)
Coachella Valley Storm Water Channel	Pathogens, Toxaphene, DDT, Dieldrin and PCBs	FRSH, REC 1, REC 2, WARM, WILD, RARE	Designated as RARE (18.5 miles)

Note: 1) The Salton Sea is the terminus for the Coachella Valley Storm Water Channel. However, note that the Salton Sea is not located within the “Whitewater Region” receiving waters as outlined in the Riverside County WQMP.

III. Pollutants

Table 1. Pollutant of Concern Summary

Pollutant Category	Potential for Project	Causing Receiving Water Impairment
Bacteria/Virus (pathogens ¹)	Yes	Yes
Heavy Metals	No	No
Nutrients	Yes	No
Pesticides	Yes	No
Toxaphene ² , DDT and Dieldren	No	Yes
Organic Compounds ³ (PCBs)	Yes	Yes
Sediments and Turbidity	Yes	No
Trash & Debris	Yes	No
Oxygen Demanding Substances	Yes	No
Oil & Grease ⁴	Yes	No

- Notes:
- 1) Pathogens are disease causing virus or bacteria. Pathogens are an impairment in the Coachella Valley Storm Water Channel from Dillon Road to the Salton Sea.
 - 2) Toxaphene is an insecticide which was banned from use in the United States in 1990. Therefore, it is not a potential for the project but is currently a receiving water impairment.
 - 3) Petroleum hydrocarbons are one of the most common organic compounds associated with street and parking lots and are a potential pollutant for the site. See Section V.2 for a description of appropriate Source Control BMPs.
 - 4) Oil and grease associated with landscaping and onsite operations are potential pollutants for the development. See Section V.2 for a description of appropriate Source Control BMPs.

Discussion of Receiving Water Impairment:

Most of the pollutants which have caused impairment to the project’s receiving waters are no longer being used. Many of these pollutants can be traced back to agricultural operations prevalent in the Coachella Valley. In addition, water quality management practices (i.e., the MS4 Permit requirements) have been implemented throughout the region to govern storm and non-storm water discharges to the designated receiving waters. These discharges have the ability to impact the “Beneficial Uses” of the receiving waters and can cause or threaten to cause a condition of “pollution” or “nuisance”.

The purpose of the project WQMP is to provide Best Management Practices (BMPs) which the property owner or their designee will implement and maintain to meet the requirements of the MS4 permit, thus minimizing the pollutant load associated with urban runoff.

IV. Hydrologic Conditions of Concern

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

- Yes The project will be required to retain urban runoff onsite in conformance with local ordinance (See Table 6, Permittees Requiring Onsite Retention of Stormwater, of the Whitewater River Region WQMP). This section does not need to be completed.
- No This section must be completed.

This Project meets the following condition:

- Condition A:** Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4; the discharge is in full compliance with Permittee requirements for connections and discharges to the MS4 (including both quality and quantity requirements); the discharge would not significantly impact stream habitat in proximate Receiving Waters; and the discharge is authorized by the Permittee.
- Condition B:** The project disturbs less than 1 acre and is not part of a larger common plan of development that exceeds 1 acre of disturbance. The disturbed area calculation must include all disturbances associated with larger plans of development.
- Condition C:** The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by minimizing impervious area on a site and incorporating other site-design concepts that mimic pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the Permittee.
- None**
Refer to Section 3.4 of the Whitewater River Region WQMP for additional requirements.

V. Best Management Practices

This project implements Best Management Practices (BMPs) to address the Pollutants of Concern that may potentially be generated from the use of the project site. These BMPs have been selected and implemented to comply with the Section 3.5 of the WQMP and consist of Site Design, Source Control and, if/where necessary, Treatment Control BMPs as described herein.

V.1 *Site Design and Treatment Control BMPs*

Local Jurisdiction Requires On-Site Retention of Urban Runoff:

Yes The project will be required to retain urban runoff onsite in conformance with local ordinance (See Table 6, Permittees Requiring Onsite Retention of Stormwater, of the Whitewater River Region WQMP). Section V.1 does not need to be completed.

No Section V.1 must be completed.

This section of the Project-Specific WQMP documents the Site Design BMPs and, if/where necessary the Treatment Control BMPs that will be implemented on the Project to meet the requirements within Section 3.5.1 of the Whitewater River Region WQMP. Section 3.5.1, includes requirements to implement Site Design Concepts and BMPs, and includes requirements to address the project's Pollutants of Concern with BMPs. Further sub-section 3.5.1.1 of the Whitewater River Region WQMP specifically requires that the projects Pollutants of Concern be addressed with Site Design BMPs to the extent feasible.

This project incorporates Site Design BMPs to fully address the Pollutants of Concern where and to the extent feasible. If and where it has been acceptably demonstrated to the Permittee that it is infeasible to fully meet this requirement with Site Design BMPs, this section includes a description of the conventional Treatment Control BMPs that will be substituted to meet the same requirements.

In addressing pollutants of concern, BMPs are selected using Table 2 below.

Table 2. BMP Selection Matrix Based Upon Pollutant Removal Efficiency ⁽¹⁾

(Excerpted, with minor revision, from the Orange County Water Quality Management Plan dated September 26, 2003
and the San Bernardino Water Quality Management Plan dated April 14, 2004)

Pollutant of Concern	Biofilters ⁽²⁾	Detention Basins ⁽³⁾	Infiltration BMPs ⁽⁴⁾	Wet Ponds or Wetlands ⁽⁵⁾	Filtration Systems ⁽⁶⁾	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁷⁾	Manufactured or Proprietary Devices ⁽⁸⁾
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for Turbidity)	U
Nutrients	L	M	H/M	H/M	L/M	L	L	U
Organic Compounds	U	U	U ⁽⁹⁾	U	H/M	L	L	U
Trash & Debris	L	M	U	U	H/M	M	H/M	U
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U
Oil & Grease	H/M	M	U ⁽⁹⁾	U	H/M	M	L/M	U
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U
Metals	H/M	M	H	H	H	L	L	U

Abbreviations:

L: Low removal efficiency H/M: High or medium removal efficiency U: Unknown removal efficiency

Notes:

- (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
- (2) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.
- (3) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.
- (4) Includes infiltration basins, infiltration trenches, and porous pavements.
- (5) Includes permanent pool wet ponds and constructed wetlands.
- (6) Includes sand filters and media filters.
- (7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.
- (8) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in the WQMP, or newly developed/emerging stormwater treatment technologies.
- (9) Per CASQA BMP TC-11, infiltration basins have high removal efficiency of organics and oil and grease. See attached BMP in Appendix C.

V.1.A Site Design BMPs

This section documents the Site Design BMPs that will be implemented on this project to comply with the requirements in Section 3.5.1 of the Whitewater River Region WQMP.

- Table 3 herein documents the implementation of the Site Design Concepts described in sub-sections 3.5.1.3 and 3.5.1.4 of the Whitewater River Region WQMP.
- Table 4 herein documents the extent to which this project has implemented the goals described in sub-sections 3.5.1.1 of the Whitewater River Region WQMP.

Table 3. Implementation of Site Design Concepts

Design Concept	Technique	Specific BMP	Included			Brief Reason for BMPs Indicated as No or N/A
			Yes	No	N/A	
Site Design Concept 1	Minimize Urban Runoff, Minimize Impervious Footprint, and Conserve Natural Areas (See Whitewater River Region WQMP Section 3.5.1.3)	Conserve natural areas by concentrating or cluster development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Entire site will be disturbed.
		Conserve natural areas by incorporating the goals of the Multi-Species Habitat Conservation Plan or other natural resource plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Will pay MSHCP fees and/or follow guidelines as required.
		Preserve natural drainage features and natural depressional storage areas on the site.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No natural drainage features exist onsite.
		Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use natural drainage systems.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Proposed streets/storm drain system will convey storm flow to existing off-site drainage facilities designed to accommodate them.
		Increase the building floor area ratio (i.e., number of stories above or below ground).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Construct streets, sidewalks and parking lot aisles to minimum widths necessary, provided that public safety and a walkable environment for pedestrians is not compromised.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Reduce widths of streets where off-street parking is available.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
		Design driveways with shared access, flared (single lane at street), or wheel strips (paving only under the tires).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Streets and driveways are designed to City of Palm Desert minimum standards.
		Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Other comparable and equally effective Site Design BMP (or BMPs) as approved by the Permittee (Note: Additional narrative required to describe BMP and how it addresses site design concept).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Runoff tributary to large on-site Lagoon does not surface flow off-site.

Table 3. Site Design BMPs (continued)

Design Concept	Technique	Specific BMP	Included			Brief Reason for Each BMP Indicated as No or N/A
			Yes	No	N/A	
Site Design Concept 2	Minimize Directly Connected Impervious Area (See Whitewater River Region WQMP Section 3.5.1.4)	Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Runoff from impervious areas will be collected underground and conveyed to adjacent landscaped golf course as intended in the original golf course design.
		Incorporate landscaped buffer areas between sidewalks and streets.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Planter areas are designated between buildings, sidewalks and streets.
		Uncovered temporary or guest parking on residential lots paved with a permeable surface, or designed to drain into landscaping.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Parking area runoff to be collected and conveyed to designated drainage collection areas.
		Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs used at street corners, and culverts used under driveways and street crossings.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Street sheet flow runoff to be collected and conveyed to designated drainage collection areas within adjacent golf course.
		Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale or biofilter.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Street sheet flow runoff to be collected and conveyed to designated drainage collection areas within adjacent golf course
		Dual drainage system: first flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder; high flows connect directly to MS4s.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Street sheet flow runoff to be collected and conveyed to designated drainage collection areas within adjacent golf course.
		Maximize the permeable area by constructing walkways, trails, patios, overflow parking, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces such as pervious concrete, porous asphalt, unit pavers, and granular materials.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Permeable hardscape surfaces will be constructed where possible.

Design Concept	Technique	Specific BMP	Included			Brief Reason for Each BMP Indicated as No or N/A
			Yes	No	N/A	
		Incorporate parking area landscaping into the drainage design.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	All drainage collection areas are off-site in the existing adjacent golf course.
		Where soil conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Construct onsite infiltration BMPs such as dry wells, infiltration trenches, and infiltration basins consistent with vector control objectives.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing golf course retention and infiltration system will be used.
		Construct onsite ponding areas or detention facilities to increase opportunities for infiltration consistent with vector control objectives.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing golf course retention and infiltration system will be used.

Table 3. Site Design BMPs (continued)

Design Concept	Technique	Specific BMP	Included			Brief Reason for Each BMP Indicated as No or N/A
			Yes	No	N/A	
Site Design Concept 2 <i>(cont'd)</i>	Minimize Directly Connected Impervious Area (See Whitewater River Region WQMP Section 3.5.1.4)	Direct roof runoff into cisterns or rain barrels for reuse.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Roof runoff directed underground and conveyed to existing off-site golf course retention facilities
		Use vegetated drainage swales in lieu of underground piping or imperviously lined swales.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No open space opportunities exist. Runoff will be conveyed to an existing off-site infiltration system.
		Incorporate tree well filters, flow-through planters, and/or bioretention areas into landscaping and drainage plans.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No open space opportunities exist. Runoff will be conveyed to an existing off-site infiltration system.
		Other comparable and equally effective Site Design BMP (or BMPs) as approved by the Permittee (Note: Additional narrative required describing BMP and how it addresses site design concept).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6 acre Lagoon does not contribute to off-site runoff.

Project Site Design BMPs:

The existing adjacent Desert Willow Resort South Golf Course acts as a drainage retention facility designed to accommodate flows from all drainage areas within Desert Willow Resort.

Alternative Project Site Design BMPs:

No alternatives to the existing adjacent retention basin and storm drain collection facilities have been proposed.

Table 4. Site Design BMPs Meeting the Measureable Goal in WQMP Section 3.5.1.1

(1) DRAINAGE SUBAREA ID OR NO.	(2) SITE DESIGN BMP TYPE * (See Table 2)	(3) POLLUTANTS WITHIN SUBAREA CAUSING RECEIVING WATER IMPAIRMENTS (refer to Table 1)	(4) RELATIVE EFFECTIVENESS OF BMP (COLUMN 2) AT ADDRESSING IDENTIFIED POLLUTANTS (COLUMN 3) (U, L, M, H/M, H; see Table 2)	(5) BMP MEETS WHICH DESIGN CRITERIA? (identify as V _{BMP} OR Q _{BMP})	(6) BMP TRIBUTARY AREA (nearest 0.1 acre)
ALL	INFILTRATION	BACTERIA, NUTRIENTS	U, H/M	V _{BMP}	17.8
TOTAL AREA TREATED WITH SITE DESIGN BMPS (NEAREST 0.1 ACRE)**					17.8 AC

* Site Design BMPs included in this table are those that completely address the Treatment Requirements for their tributary area.

V.1.B Treatment Control BMPs

Conventional Treatment Control BMPs shall be implemented to address the project's Pollutants of Concern as required in WQMP Section 3.5.1 where, and to the extent that, Section V.1.A has demonstrated that it is infeasible to meet these requirements through implementation of Site Design BMPs.

- The Site Design BMPs described in Section V.1.A of this project-specific WQMP completely address the Pollutants of Concern for the entire project site as required in Section 3.5.1.1 of the Whitewater River Region WQMP. Supporting documentation for the sizing of these Site Design BMPs is included in Appendix F (Desert Willow South Golf Course Hydrology – 2/12/18). *Section V.1.B **need not** be completed.

 - The Site Design BMPs described in Section V.1.A of this project-specific WQMP do **NOT** completely address the Pollutants of Concern for the entire project site as required in Section 3.5.1.1 of the Whitewater River Region WQMP. *Section V.1.B **must** be completed.
-
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V.1.C Measureable Goal Summary

This section documents the extent to which this project meets the measureable goal described in the Whitewater River Region WQMP Section 3.5.1.1 of addressing all of the projects Treatment Requirements with Site Design BMPs.

Table 6. Measureable Goal Summary

(1)	(2)	(3)
Total Area Treated with <u>Site Design</u> BMPs	Total Area Treated with <u>Treatment Control</u> BMPs	% of Treatment Requirement addressed with Site Design BMPs
17.8 Ac	N/A	100%

Note – The entire 17.8 acre site is treated with site design BMPs.

V.2 Source Control BMPs

This section identifies and describes the Source Control BMPs applicable and implemented on this project.

Table 7. Source Control BMPs

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Activity Restrictions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Irrigation System and Landscape Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Common Area Litter Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Drainage Facility Inspection and Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Structural Source Control BMPs			
MS4 Stenciling and Signage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No MS4 facilities onsite.
Landscape and Irrigation System Design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protect Slopes and Channels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Provide Community Car Wash Racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not part of project design.
Properly Design*:			
Fueling Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No facilities.
Air/Water Supply Area Drainage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No facilities.
Trash Storage Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Loading Docks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Maintenance Bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No facilities.
Vehicle and Equipment Wash Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No facilities.
Outdoor Material Storage Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Outdoor Work Areas or Processing Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No facilities.
Provide Wash Water Controls for Food Preparation Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

*Details demonstrating proper design must be included in Appendix F.

5.2.1 Non-Structural Source Control BMPs

5.2.1.1 Education

Yes

The owner, as responsible party for implementing the WQMP, will ensure that all residents and others are properly trained and attend continuing education classes.

5.2.1.2 Activity Restrictions

Yes

Certain activities within the project area may be restricted to enable the owner to meet the City's water quality requirements. For example, to eliminate storm water contamination by oil and grease, service or repair of all vehicles may be restricted to a predesignated area (loading-lay down area).

Similarly, washing of vehicles shall be restricted to this predesignated area, so as to not contaminate the storm drain system.

5.2.1.3 Irrigation System and Landscape Maintenance

Yes

Owner shall ensure that the irrigation systems within the project site are operating properly. Owner shall also ensure that the ground's landscaping is maintained regularly so that the project site is in compliance with all City and Coachella Valley Water District water quality requirements.

5.2.1.4 Common Area Litter Controls

Yes

Owner shall ensure that employees regularly patrol the site in an effort to keep it free of litter so that the project site is in compliance with all City water quality requirements.

5.2.1.5 Street Sweeping

Yes

Owner shall ensure that private streets/driveways and parking lots within the project are regularly swept so that the project site is in compliance with all City water quality requirements. Streets and parking lots shall be swept at least quarterly, including just prior to start of the rainy season (October 1st). The frequency shall be no less than the frequency of street sweeping by the Co-Permittee on public streets.

5.2.1.6 Drainage Facility Inspection and Maintenance

Yes

Owner shall ensure that drainage facilities within the project area are regularly inspected (at least annually) and maintained properly so that the project site is in compliance with all City water quality requirements. At a minimum, routine maintenance of drainage facilities should take place in the late summer or early fall prior to the start of the rainy season (October 1st). Drainage facilities must be cleaned if accumulated sediment/debris fills 25% or more of the storage capacity of the facility.

5.2.2 Structural Source Control BMPs

5.2.2.1 MS4 Stenciling and Signage

No

No MS4 facilities exist onsite.

5.2.2.2 Landscape and Irrigation System Design

Yes

The project will be designed to include a variety of plants, including native, drought tolerant plants. These types of plants use less water, and help reduce the use of fertilizers and pesticides. The irrigation system will be programmable and utilize drip emitters, limiting excess irrigation runoff. The landscape and irrigation system will be designed in accordance with the City's water quality requirements and the Coachella Valley Water District's irrigation requirements.

5.2.2.3 Protect Slopes and Channels

Yes

Any proposed slopes and channels on site will be provided erosion control measures.

5.2.2.4 Provide Community Car Wash Racks

No

The project site will not include community car wash racks as part of the project design.

5.2.2.5 Fueling Areas

No

The project site will not include fueling areas.

5.2.2.6 Air/Water Supply Area Drainage

No

The project site will not include air/water supply areas.

5.2.2.7 Trash Storage Areas

Yes

The project site will include trash storage areas. Trash storage (or trash enclosures) will be located near or along the proposed perimeter access road, the north and south ends of the site. Also, trash dumpsters will have attached covers and shall be leak proof. The entire trash storage surface area will be concrete.

5.2.2.8 Loading Docks

Yes

Loading dock areas will be kept clean and spills will be cleaned promptly. Non-storm water discharges are to be kept out of storm drain facilities in the loading dock area. Employees shall be trained on proper spill response procedures.

5.2.2.9 Maintenance Bays

No

The project site will not include maintenance bays.

5.2.2.10 Vehicle and Equipment Wash Areas

No

The project site will not include vehicle and equipment wash areas.

5.2.2.11 Outdoor Material Storage Areas

Yes

Outdoor material storage areas will be equipped with temporary coverings (tarps, plastic sheeting) when not covered permanently to limit or prevent exposure to rainfall which might otherwise result in contaminated runoff.

5.2.2.12 Outdoor Work Areas or Processing Areas

No

The project site will not include outdoor work areas or processing areas.

5.2.2.13 Wash Water Areas for Food Preparation Areas

Yes

All outdoor food preparation areas will be limited to covered, bermed areas with drains connected to sanitary sewer plumbing.

Appendix D includes copies of the educational materials that will be used in implementing this project-specific WQMP.

V.3 Equivalent Treatment Control Alternatives

This project will not include any other treatment control alternatives.

V.4 Regionally-Based Treatment Control BMPs

This project will not include any regionally-based treatment control BMPs.

VI. Operations and Maintenance Responsibility for BMPs

Appendix G of the project-specific Final WQMP will include copies of CC&Rs, an executed Covenant and Agreement, or other mechanism used to ensure the ongoing operation, maintenance, funding, transfer and implementation of the project-specific WQMP requirements as part of the Final WQMP.

Operations and maintenance (O&M) will be performed, as necessary, by Desert Wave Ventures, their agents, and/or their assignees. The BMPs for the project are primarily existing retention basins or storm water collection systems located within the adjacent Desert Willow Resort South Golf Course. Maintenance of the site, retention basins, and storm water collection facilities consists primarily of the removal of trash and debris, repair and removal/reinstallation of the facility if damaged or saturated by native material (due to wind and water erosion) or sediment and organic material from human activity. Any removed material must be hauled away to an approved disposal facility. See Appendix D for a recommended “Infiltration System Maintenance Plan”.

Routine inspection and required maintenance of all BMPs and the site should begin immediately upon completion of construction and continue throughout the life of the project. Records of all inspection and repair/modifications shall be kept by the owner. The following persons shall be responsible for all O&M and inspections, until such time as another staff member is designated:

Doug Sheres – Managing Member
Desert Wave Ventures, LLC
PO Box 147
Solana Beach, CA 92075
Doug@Paramocap.com

John Luff – Managing Member
Desert Wave Ventures, LLC
PO Box 147
Solana Beach, CA 92075
John@FS-Ventures.com

VII. Funding

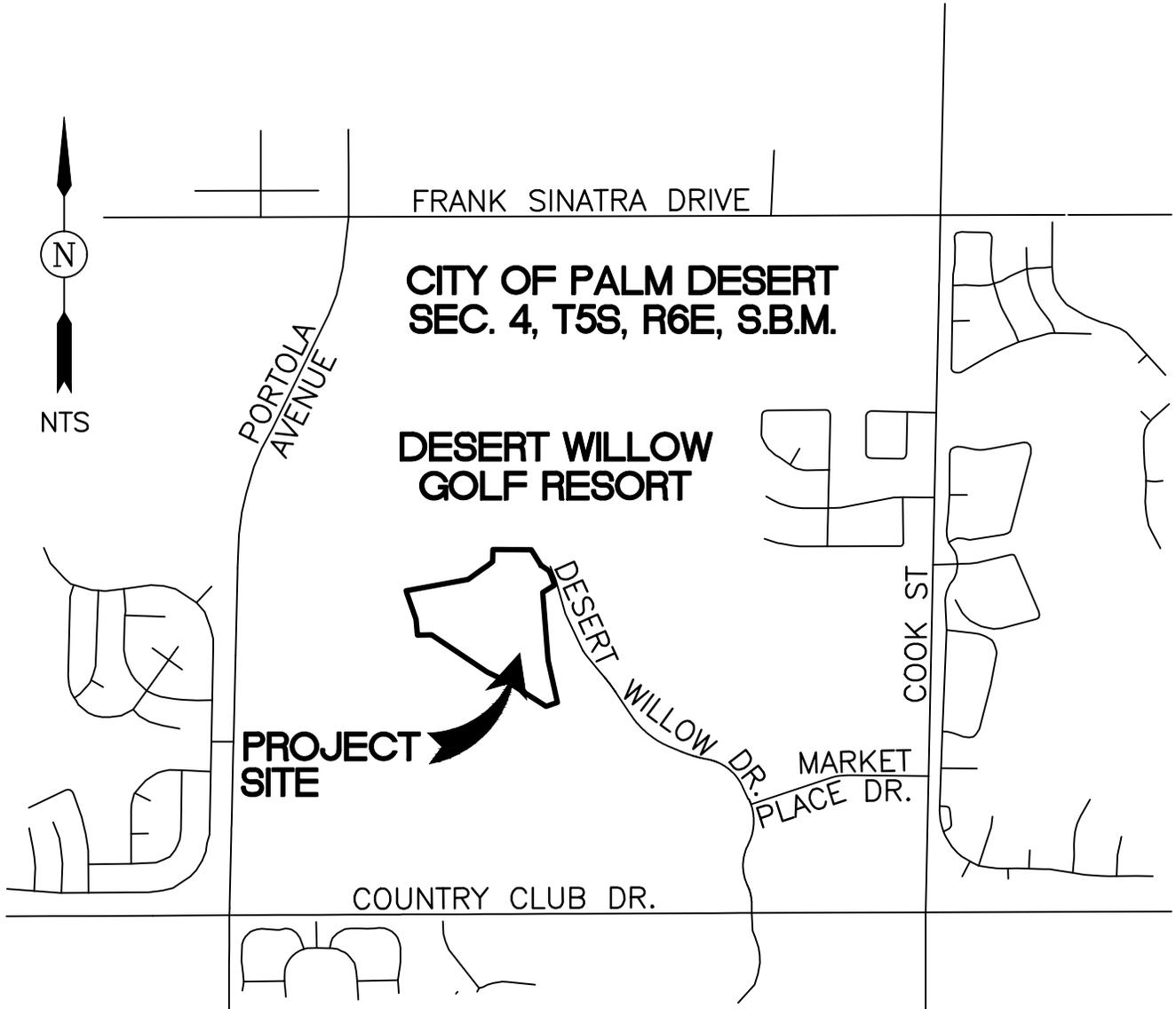
Source funding and long term funding will be provided by Desert Wave Ventures, LLC, their agents, and/or assignees. Operations and maintenance of the project BMPs are to be scheduled and implemented regularly and continuously during the life of the project. Funding is addressed in an agreement which will be included in the Final WQMP.

Appendix A

Conditions of Approval
(See Final WQMP)

Appendix B

Vicinity Map, WQMP Site Plan, and Receiving Waters Map



VICINITY MAP

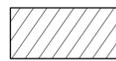
SITE DATA

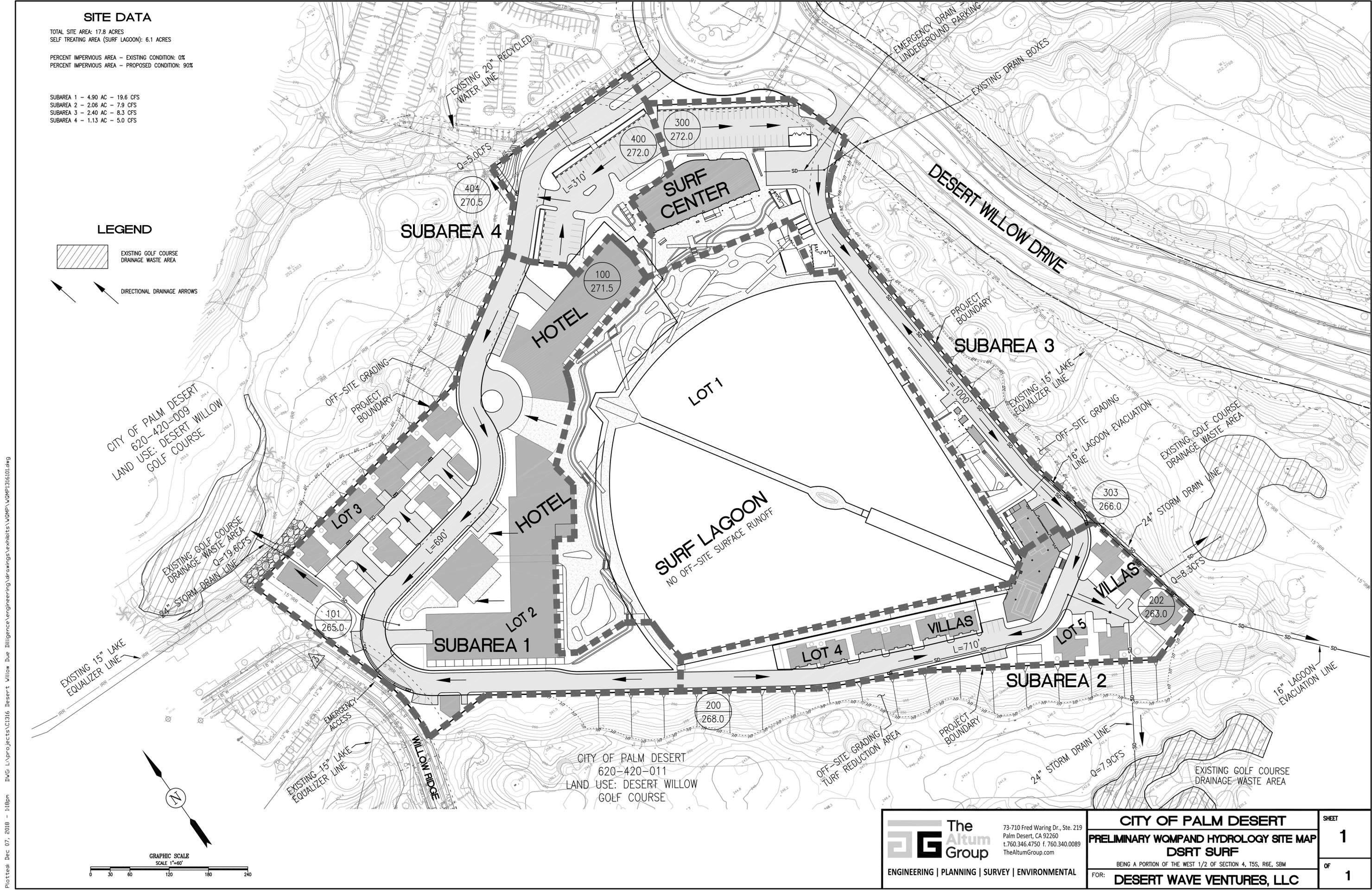
TOTAL SITE AREA: 17.8 ACRES
 SELF-TREATING AREA (SURF LAGOON): 6.1 ACRES

PERCENT IMPERVIOUS AREA - EXISTING CONDITION: 0%
 PERCENT IMPERVIOUS AREA - PROPOSED CONDITION: 90%

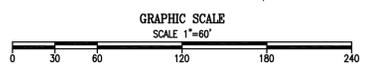
SUBAREA 1 - 4.90 AC - 19.6 CFS
 SUBAREA 2 - 2.06 AC - 7.9 CFS
 SUBAREA 3 - 2.40 AC - 8.3 CFS
 SUBAREA 4 - 1.13 AC - 5.0 CFS

LEGEND

-  EXISTING GOLF COURSE DRAINAGE WASTE AREA
-  DIRECTIONAL DRAINAGE ARROWS



Plotted: Dec 07, 2018 - 11:18pm DWG: L:\projects\CI316 Desert Willow Due Diligence\engineering\drawings\exhibits\WOMP\1316101.dwg

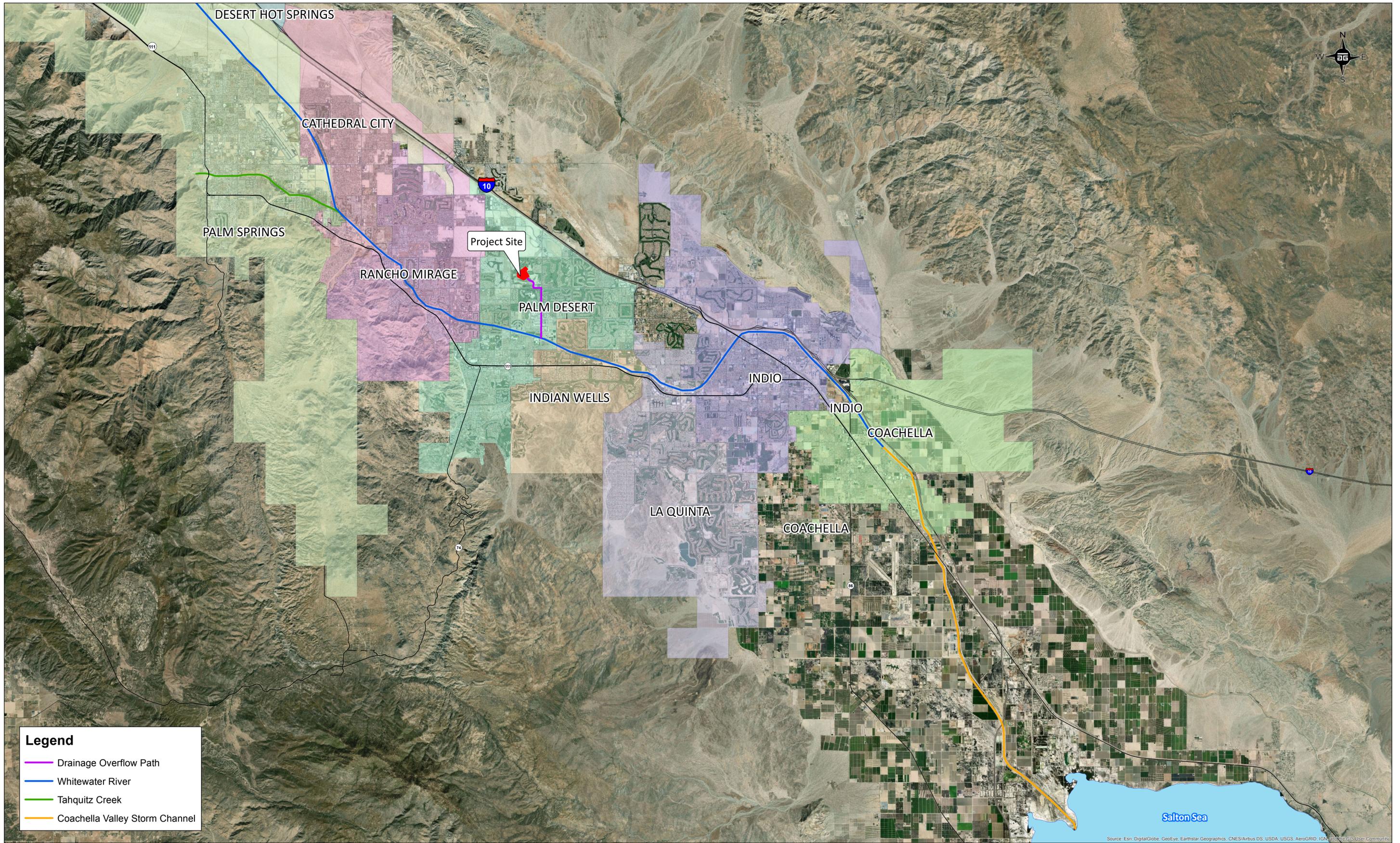


The Altum Group
 ENGINEERING | PLANNING | SURVEY | ENVIRONMENTAL

73-710 Fred Waring Dr., Ste. 219
 Palm Desert, CA 92260
 t.760.346.4750 f.760.340.0089
 TheAltumGroup.com

CITY OF PALM DESERT
PRELIMINARY WOMPAND HYDROLOGY SITE MAP
DSRT SURF
 BEING A PORTION OF THE WEST 1/2 OF SECTION 4, T5S, R6E, SBM
FOR: DESERT WAVE VENTURES, LLC

SHEET **1**
 OF **1**



Legend

- Drainage Overflow Path
- Whitewater River
- Tahquitz Creek
- Coachella Valley Storm Channel

1 in = 7,020 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix C

Hydraulic and Hydrologic Summary of Findings

Appendix D

Educational Materials



A Citizen's Guide to Understanding Stormwater



EPA
United States Environmental Protection Agency

EPA 833-B-03-002

January 2003

Internet Address (URL): <http://www.epa.gov>
Oil Based Inks on 100% Postconsumer Recycled Paper • Printed with Vegetable Process Chlorine Free Recycled Paper



After the Storm

For more information contact:
www.epa.gov/nps/stormwater
or visit
www.epa.gov/nps



What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- ◆ Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- ◆ Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- ◆ Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- ◆ Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- ◆ Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.

◆ Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.



- ◆ Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- ◆ Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- ◆ Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- ◆ Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.



- ◆ Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- ◆ Don't dispose of household hazardous waste in sinks or toilets.

Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.



- ◆ Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- ◆ Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.



- ◆ When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.



Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.



Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for



rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- ◆ Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- ◆ Cover grease storage and dumpsters and keep them clean to avoid leaks.
- ◆ Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- ◆ Divert stormwater away from disturbed or exposed areas of the construction site.
- ◆ Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- ◆ Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.



Construction

Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- ◆ Keep livestock away from streambanks and provide them a water source away from waterbodies.
- ◆ Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- ◆ Vegetate riparian areas along waterways.
- ◆ Rotate animal grazing to prevent soil erosion in fields.
- ◆ Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

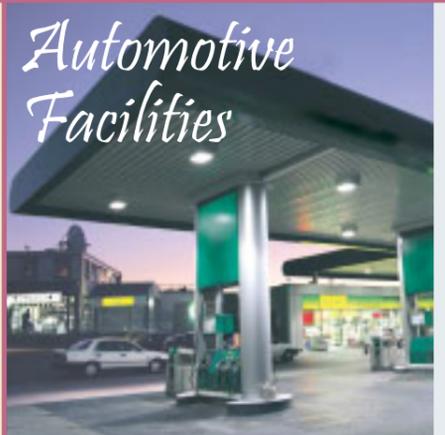


Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- ◆ Conduct preharvest planning to prevent erosion and lower costs.
- ◆ Use logging methods and equipment that minimize soil disturbance.
- ◆ Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- ◆ Construct stream crossings so that they minimize erosion and physical changes to streams.
- ◆ Expedite revegetation of cleared areas.

Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- ◆ Clean up spills immediately and properly dispose of cleanup materials.
- ◆ Provide cover over fueling stations and design or retrofit facilities for spill containment.
- ◆ Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- ◆ Install and maintain oil/water separators.

CREATE A HEALTHY ENVIRONMENT in and around your home by following these simple pet practices. Your pet, family and neighbors will appreciate their clean comfortable surroundings.

HOUSEHOLD PETS

We all love our pets, but pet waste is a subject everyone likes to avoid. Pet waste left on trails, sidewalks, streets and grassy areas can be washed into the nearest waterway when it rains. Even if you can't see streams or lakes near you, rainfall (stormwater) or sprinkler runoff can wash pet waste into the storm drains that carry runoff to the nearest streams or lakes untreated. The risk of stormwater contamination increases if pet waste is allowed to accumulate in outdoor animal pen areas or left on sidewalks, streets or driveways.



Pet waste contains nutrients and bacteria. Nutrients can promote the growth of algae in streams and lakes. Algae can cause fish kills and other environmental damage if it is fed too many nutrients. Pet Waste also contains e. Coli and fecal bacteria, which

can cause disease in other animals and humans that come in contact with it when swimming or splashing in streams and lakes. Dogs also carry salmonella and giardia, which can make people sick.

Pet waste that is not picked up and properly disposed can also increase vector problems. Flies and other insects are not only attracted to and feed on pet waste, but can also be infected with diseases and spread those diseases to humans and other animals.

WHAT CAN YOU DO?

- **SCOOP** up pet waste and flush it down the toilet or place in trash can.
- **NEVER DUMP** pet waste into a storm drain or catch basin.
- **USE** the complimentary bags or mutt mitts offered in dispensers at local parks.
- **CARRY EXTRA BAGS** when walking your dog and make them available to other pet owners who are without.
- **TEACH CHILDREN** how to properly clean up after a pet.
- **TELL FRIENDS AND NEIGHBORS** about the ill effects of animal waste on the environment. Encourage them to clean up after pets.

Call 1-800-506-2555 TOLL FREE to report illegal dumping to the storm drain, find the dates and times of local Household Hazardous Waste Collection Events, obtain additional information on stormwater problems and solutions, request presentations about stormwater pollution in your child's classroom, or learn about free grasscycling and composting workshops.

What's the Scoop?



TIPS FOR A HEALTHY PET AND A HEALTHIER ENVIRONMENT

RIVERSIDE COUNTY ANIMAL SERVICES LOCATIONS:

www.rcdas.org

BLYTHE

16450 West Hobson Way
Blythe, CA 92225
760-921-7857

COACHELLA VALLEY ANIMAL CAMPUS

72-050 Petland Place
Thousand Palms, CA 92276
760-343-3644

RIVERSIDE COUNTY ANIMAL SERVICES

6851 Van Buren Blvd.
Riverside, CA 92509
951-688-4340

OTHER ANIMAL SHELTERS:

ANIMAL CARE CENTER OF INDIRIO

45-355 Van Buren
Indio, CA 92201
760-391-4138

ANIMAL FRIENDS OF THE VALLEYS

29001 Bastron Avenue
Lake Elsinore, CA 92530
951-674-0618

(Serving incorporated Temecula, Wildomar,
Lake Elsinore, Murrieta and Canyon Lake)

MARY S. ROBERTS PET ADOPTION CENTER

6185 Industrial Avenue
Riverside, CA 92504
951-688-4340

RAMONA HUMANE SOCIETY

690 Humane Way
San Jacinto 92586
951-654-8002

(Serving Sun City, Menifee, Romoland and Homeland)

Looking to adopt a pet?

This website is linked to many animal shelters.
www.petfinder.com

To report illegal storm drain disposal, call
1-800-506-2555

Or visit our website at www.rcflood.org

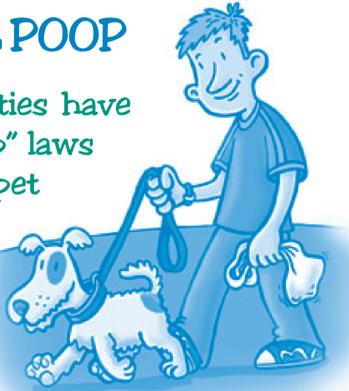
E-mail fcnpdes@rcflood.org



SCOOP THE POOP

Many communities have "Scoop the Poop" laws that govern pet waste cleanup.

Some of these laws specifically require anyone who walks an animal off their property to carry a bag, shovel, or scooper. Any waste left by the animal must be cleaned up immediately. **CALL YOUR LOCAL CODE ENFORCEMENT OFFICE** to find out more about pet waste regulations.



OTHER WAYS TO PROTECT YOUR PETS AND THE ENVIRONMENT

Pets are only one of many sources that contribute to water pollution. However, these other sources of water pollution cannot only harm the environment but also harm your pet. Improperly used or stored lawn fertilizers, pesticides, soaps, grease and vehicle fluids cannot only be washed into local streams and lakes, these chemicals can also harm your pet if they ingest or touch these chemicals. Call 1-800-506-2555 for information regarding how to properly dispose of household hazardous wastes

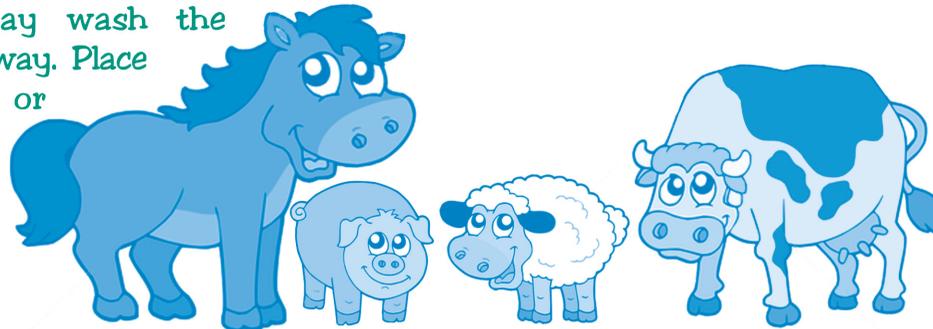
such as these. You can also keep your pets and our environment healthy by properly maintaining your vehicles, and limiting use of pesticides and fertilizers to only the amount that is absolutely needed.

Make sure to not only protect your pets, but to also protect your neighbors pets. **NEVER HOSE VEHICLE FLUIDS** into the street or gutter. **USE ABSORBENT MATERIALS** such as cat litter to clean-up spills. **SWEEP UP** used absorbent materials and place it in the trash.

HORSES AND LIVESTOCK

Fortunate enough to own a horse or livestock? You, too, can play a part in protecting and cleaning up our water resources. The following are a few simple Best Management Practices (BMPs) specifically designed for horses and livestock.

- **STORE** your manure properly. Do not store unprotected piles of manure in places where stormwater runoff may wash the manure away. Place a cover or tarp over the pile to keep rainwater out.



- **BUILD** a manure storage facility to protect your pets, property and the environment. These structures usually consist of a concrete pad to protect groundwater and a short wall on one or two sides to make manure handling easier.
- **READ** the Only Rain Down the Storm Drain brochure titled "Tips for Horse Care" for additional guidance and recommendations. This brochure should be available from your local city office or for download at www.rcflood.org/stormwater.
- **KEEP** animals out of streams - Horses and livestock can defecate in streams causing stormwater pollution. Livestock and horses in streams can also disturb sensitive habitat and vegetation, causing additional environmental damage. Keep livestock and horses away from streams and use designated stream crossings whenever possible.

- **MATERIAL STORAGE SAFETY TIPS** Many of the chemicals found in barns require careful handling and proper disposal. When using these chemicals, be certain to follow these common sense guidelines:

- ◆ Buy only what you need.
- ◆ Treat spills of hoof oils like a fuel spill. Use kitty litter to soak up the oil and dispose of it in a tightly sealed plastic bag.
- ◆ Store pesticides in a locked, dry, well-ventilated area.
- ◆ Protect stored fertilizer and pesticides from rain and surface water.

RESOURCE CONSERVATION DISTRICTS CAN HELP

Call 1-800-506-2555 for assistance with locating a local conservation district that can help you properly manage your manure, re-establish healthy pastures, control weeds, or identify appropriate grasses for your soils.

Thank you for doing your part to protect your watershed, the environment, your pets and your community!



Helpful telephone numbers and links:

Riverside County Stormwater Protection Partners

Flood Control District	(951) 955-1200
County of Riverside	(951) 955-1000
City of Banning	(951) 922-3105
City of Beaumont	(951) 769-8520
City of Calimesa	(909) 795-9801
City of Canyon Lake	(951) 244-2955
Cathedral City	(760) 770-0327
City of Coachella	(760) 398-4978
City of Corona	(951) 736-2447
City of Desert Hot Springs	(760) 329-6411
City of Eastvale	(951) 361-0900
City of Hemet	(951) 765-2300
City of Indian Wells	(760) 346-2489
City of Indio	(760) 391-4000
City of Lake Elsinore	(951) 674-3124
City of La Quinta	(760) 777-7000
City of Menifee	(951) 672-6777
City of Moreno Valley	(951) 413-3000
City of Murrieta	(951) 304-2489
City of Norco	(951) 270-5607
City of Palm Desert	(760) 346-0611
City of Palm Springs	(760) 323-8299
City of Perris	(951) 943-6100
City of Rancho Mirage	(760) 324-4511
City of Riverside	(951) 361-0900
City of San Jacinto	(951) 654-7337
City of Temecula	(951) 694-6444
City of Wildomar	(951) 677-7751

REPORT ILLEGAL STORM DRAIN DISPOSAL

1-800-506-2555 or e-mail us at
fcnpdes@rcflood.org

- Riverside County Flood Control and Water Conservation District
www.rcflood.org

Online resources include:

- California Storm Water Quality Association
www.casqa.org
- State Water Resources Control Board
www.waterboards.ca.gov
- Power Washers of North America
www.thepwna.org

Stormwater Pollution

What you should know for...

Outdoor Cleaning Activities and Professional Mobile Service Providers



Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

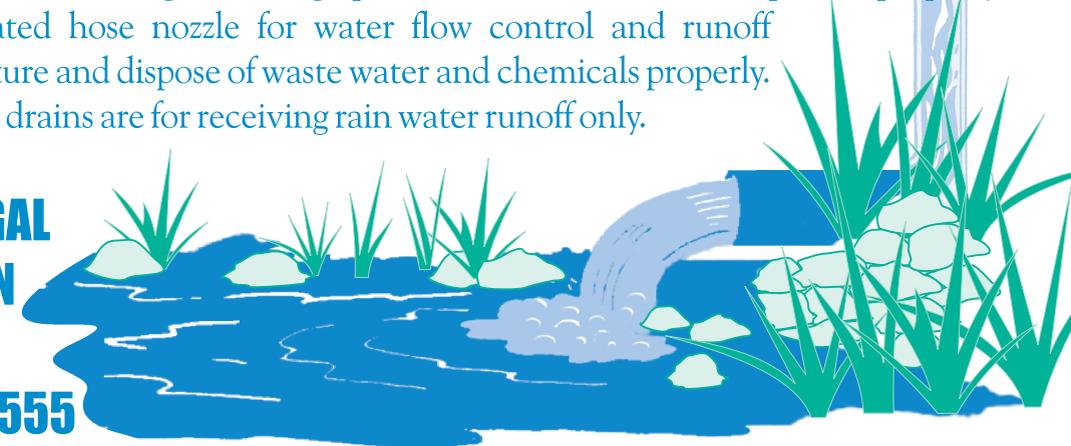
Storm drains are NOT connected to sanitary sewer systems and treatment plants!



The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** Always have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

**REPORT ILLEGAL
STORM DRAIN
DISPOSAL
1-800-506-2555**



Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

Did you know that disposing of pollutants into the street, gutter, storm drain or body of water is **PROHIBITED** by law and can result in stiff penalties?

Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. *Each of us* can do our part to keep stormwater clean by using the suggested BMPs below:

Simple solutions for both light and heavy duty jobs:

Do...consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

Do...prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

Do...use vacuums or other machines to remove and collect loose debris or litter before applying water.

Do...obtain the property owner's permission to dispose of *small amounts* of power washing waste water on to landscaped, gravel or unpaved surfaces.

Do...check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

Do...be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

Do...check to see if local ordinances prevent certain activities.

Do not let...wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.



Report illegal storm drain disposal
Call Toll Free
1-800-506-2555

Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.



When cleaning surfaces with a *high-pressure washer* or *steam cleaner*, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks **with loose paint**, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.

Saltwater Pools

- Salt water pools, although different from regular pools, are in fact, sanitized using chlorine. A salt-chlorine generator separates the chlorine and sodium molecules in salt and reintroduces them into the pool water. The same harmful effects of chlorine still apply.
- A salt water pool is still maintained with chemicals such as Muriatic acid, soda ash and sodium carbonate to help keep a proper pH, total Alkalinity, Calcium Hardness and Stabilizer levels.



- It may be illegal to discharge salt water to land. The salt may kill plants and the build-up of salt in soil puts animals, plants, and groundwater at risk. Consult your city representatives to determine local requirements regarding salt water drainage.

NEVER put unused chemicals into the trash, onto the ground or down a storm drain.

IMPORTANT: The discharge of pollutants into the street, gutter, storm drain system or waterways - without a permit or waiver - is strictly prohibited by local ordinances, state and federal law. Violations may result in monetary fines and enforcement actions.

Helpful telephone numbers and links

RIVERSIDE COUNTY WATER AGENCIES:

City of Banning.....	(951) 922-3130
City of Beaumont/Cherry Valley.....	(951) 845-9581
City of Blythe.....	(760) 922-6161
City of Coachella.....	(760) 398-3502
City of Corona.....	(951) 736-2263
City of Hemet.....	(951) 765-3710
City of Norco.....	(951) 270 5607
City of Riverside Public Works.....	(951) 351-6140
City of San Jacinto.....	(951) 654-4041
Coachella Valley Water District.....	(760) 398-2651
Desert Water Agency (Palm Springs).....	(760) 323-4971
Eastern Municipal Water District.....	(951) 928-3777
Elsinore Valley Municipal Water District.....	(951) 674 3146
Elsinore Water District.....	(951) 674-2168
Farm Mutual Water Company.....	(951) 244-4198
Idyllwild Water District.....	(951) 659-2143
Indio Water Authority.....	(760) 391-4129
Jurupa Community Services District.....	(951) 685-7434
Lee Lake Water.....	(951) 658-3241
Mission Springs Water.....	(760) 329-6448
Rancho California Water District.....	(951) 296-6900
Ripley, CSA #62.....	(760) 922-4951
Riverside Co. Service Area #51.....	(760) 227-3203
Rubidoux Community Services District.....	(951) 684-7580
Valley Sanitary District.....	(760) 347-2356
Western Municipal Water District.....	(951) 789-5000
Yucaipa Valley Water District.....	(909) 797-5117

CALL 1-800-506-2555 to:

- Report clogged storm drains or illegal storm drain disposal from residential, industrial, construction and commercial sites into public streets, storm drains and/or water bodies.
- Find out about our various storm drain pollution prevention materials.
- Locate the dates and times of Household Hazardous Waste (HHW) Collection Events.
- Request adult, neighborhood, or classroom presentations.
- Locate other County environmental services.
- Receive grasscycling information and composting workshop information.

Or visit our

Riverside County Flood Control and Water Conservation District
website at: www.rcflood.org

Other links to additional storm drain pollution information:

- County of Riverside Environmental Health: www.rivcoeh.org
- State Water Resources Control Board: www.waterboards.ca.gov
- California Stormwater Quality Association: www.casqa.org
- United States Environmental Protection Agency (EPA):
www.epa.gov/compliance/assistance (compliance assistance information)



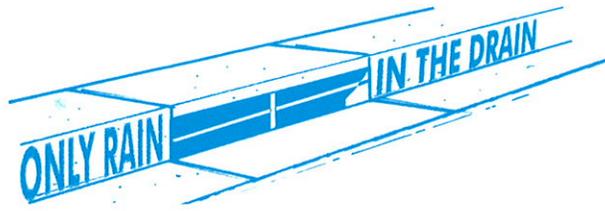
Riverside County's, "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges the Bay Area Stormwater Management Agencies Association and the Cleaning Equipment Trade Association for information provided in this brochure.

Guidelines for Maintaining your...



Swimming Pool, Jacuzzi and Garden Fountain

Where does the water go?



Pool, Jacuzzi and Fountain wastewater and rain water runoff (also called stormwater) that reach streets can enter the storm drain and be conveyed directly into local streams, rivers and lakes.



A storm drain's purpose is to prevent flooding by carrying rain water away from developed areas. Storm drains are not connected to sanitary sewers systems and treatment plants!

Wastewater, from residential swimming pools, Jacuzzis, fishponds and fountains, often contains chemicals used for sanitizing or cleansing purposes. Toxic chemicals (such as chlorine or copper-based algaecides) may pollute the environment when discharged into a storm drain system.

The Cities and County of Riverside have adopted ordinances that prohibit the discharge of wastewater to the street and storm drain system.



Discharge Regulations

Regulatory requirements for discharging wastewater from your pool may differ from city to city. Chlorinated water should not be discharged into the street, storm drain or surface waters. Check with your water agency to see if disposal to the sanitary sewer line is allowed for pool discharges (see reverse for Riverside County sewer agencies).

If allowed, a hose can be run from the pool Jacuzzi, or fountain to the private sewer cleanout, washing machine drain or a sink or bathtub.



If you cannot discharge to the sewer, you may drain your fountain, pool, or jacuzzi to your landscaping by following these guidelines:

First, reduce or eliminate solids (e.g. debris, leaves or dirt) in the pool water and allow the chemicals in the pool water to dissipate before draining the pool (this could take up to 7 days, verify using a home pool test kit).

Second, slowly drain to a landscaped area away from buildings or structures. Control the flow to prevent soil erosion; it may take more than one day to empty. Do not allow sediment to enter the street, gutter or storm drain.

Maintenance & Chemicals

Cleaning Filters

Filter rinse water and backwash must be discharged to the sanitary sewer, on-site septic tank and drain field system (if properly designed and adequately sized), or a seepage pit. Alternatively, rinse water or backwash may be diverted to landscaped or dirt areas. Filter media and other non-hazardous solids should be picked up and disposed of in the trash.



Algaecides

Avoid using copper-based algaecides unless absolutely necessary. Control algae with chlorine, organic polymers or other alternatives to copper-based pool chemicals. Copper is a heavy metal that can be toxic to aquatic life when you drain your pool.

Chemical Storage and Handling

- Use only the amount indicated on product labels
- Store chlorine and other chemicals in a covered area to prevent runoff. Keep out of reach of children and pets.
- Chlorine kits, available at retail swimming pool equipment and supply stores, should be used to monitor the chlorine and pH levels before draining your pool.
- Chlorine and other pool chemicals should never be allowed to flow into the gutter or storm drain system.

Take unwanted chemicals to a Household Hazardous Waste (HHW) Collection Event. There's no cost for taking HHW items to collection events – it's FREE! Call 1-800-506-2555 for a schedule of HHW events in your community.



Infiltration System Inspection and Maintenance Checklist

Property Address: _____

Property Owner: _____

Treatment Measure No.: _____

Date of Inspection: _____

Type of Inspection: Monthly Pre-Wet Season
 After heavy runoff(1" or greater)
 End of Wet Season Other: _____

Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Yes/No)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Standing Water	When water stands in the infiltration system between storms and does not drain within 3 days after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following may apply: sediment or trash blockages removed, improved grade from head to foot of infiltration system.
2. Trash and Debris Accumulation	Trash and debris accumulated in the infiltration system.			Trash and debris removed from infiltration system and disposed of properly.
3. Sediment	Evidence of sedimentation in system.			Material removed and disposed of properly so that there is no clogging or blockage.
4. Inlet/Outlet	Inlet/outlet areas clogged with sediment or debris, and/or eroded.			Material removed and disposed of properly so that there is no clogging or blockage in the inlet and outlet areas.
5. Overflow Spillway	Clogged with sediment or debris, and/or eroded.			Material removed and disposed of properly so that there is no clogging or blockage, and system is restored to design condition.
6. Miscellaneous	Any condition not covered above that needs attention in order for the infiltration system to function as designed.			Meet the design specifications.

Infiltration System Maintenance Plan for

Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to system failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

Table 1		
Routine Maintenance Activities for Infiltration Systems		
No.	Maintenance Task	Frequency of Task
1	Remove obstructions, debris and trash from infiltration system and dispose of properly. Drywells may be cleaned by vacuuming the upper chamber with a vacuum truck.	Monthly, or as needed after storm events
2	Inspect system to ensure that it drains between storms, and within 3 days after rainfall. Check drywell/observation well 2-3 days after storm to confirm drainage.	Monthly during wet season, or as needed after storm events
3	For drywells, replace filter material (and screen if it is damaged) in accordance with City of Rancho Mirage Standard Detail No. 306 (see attached).	Monthly, or as needed after storm events
4	Monitor drywell/observation well to confirm that system has drained during dry season.	Annually, during dry season
5	Remove any trash, grass clippings and other debris in the streets, gutters or parking area (see BMP SC-43) and near the system perimeter. Dispose of properly.	As needed
6	Inspect infiltration system using the inspection checklist.	Monthly, or after storm events 1" or greater, and after removal of accumulated debris or material

Mosquito Abatement

Standing water shall not remain in the treatment measures for more than three days, to prevent mosquito generation.

Inspections

The Infiltration System Inspection and Maintenance Checklist provided shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

10. PUBLIC EDUCATION AND OUTREACH

WATERSHED SPECIFIC EDUCATIONAL ACTIVITIES CONDUCTED DURING THE REPORTING PERIOD

This section provides an overview of watershed specific education activities conducted by the Permittees. During the reporting period **Appendix E** contains images of most public education materials that are described in this section.

Program Overview

The Riverside County NPDES Permittees have established an ongoing watershed based public education and outreach program known as the “**Only Rain Down the Storm Drain**” pollution prevention program. The specific objectives of the public education program include:

- Fostering a broad public awareness of water pollution concerns;
- Increasing public acceptance of pollution prevention activities to curtail everyday human behaviors that contribute to water quality problems;
- Educating/informing the general public, regulators and key local government and state decision makers on Urban Runoff conditions in Riverside County; and
- Promoting stewardship of local water resources.

The “Only Rain Down the Storm Drain” program implements the public awareness objectives by focusing on three areas of pollutant reduction/prevention:

- Public Behavior;
- Proper Management of Pollutants; and
- Business Specific Education Outreach.

In addition, when attempting to make use of the finite resources available to the Public Education Program, the Permittees use these management goals to ensure that resources are used effectively:

- Focusing on pollutants of concern specific to each watershed region;
- Coordinating public education efforts with adjacent storm water management programs and other related education programs to share resources, coordinate outreach efforts, and avoid costly duplication of effort; and
- Adapt public education programs and objectives, based on effectiveness analysis, to address changing MS4 programs and objectives.

Program Highlights

The public education program continues to develop changes for the better. Highlights include:

- The public education program has developed surveys in both English and Spanish. The purpose of these surveys is to evaluate the effectiveness of the public education program and are distributed to the public at community events. The results of these surveys are contained in **Appendix E**. Two surveys were also developed for the K-3 and 4 through 6 grades education outreach programs.

- The public education web page continues to be revamped and improved.
- The program continues to update brochures and develop outreach programs specific to the needs of the MS4.
- As part of the on-going effectiveness evaluation for the municipal training programs, testing has been incorporated into the training for evaluation of its efficiency. In addition, the overall training program was evaluated and is included in the Assessment and Enhancement Analysis of the NPDES Training Program, August 2006 in **Appendix E**.
- Each month, the County hosts a New Employee Orientation to an average of forty new employees. All the attendees receive “Only Rain Down the Storm Drain” materials and promotionals. The Toll Free 800 Number the message to call to report illegal storm drain disposal is incorporated into all materials.

Santa Ana Pollutants of Concern

Based on monitoring data collected to date, the current 303(d) list and discussions among the Co-Permittees, and stakeholders, the following preventative pollutants of concern were established for this watershed. More discussion on the selection of preventative pollutants of concern can be found in the monitoring section of this report. After each identified pollutant, specific BMP outreach activities are identified to address the pollutant:

- Sedimentation associated with Urban Development and Land Uses
 - Specific section on construction, municipal, industrial/commercial and new development training focusing on the need to address sedimentation within the watershed;
 - Distribution of dust pans at public education outreach events to promote dry cleaning of drive ways and impervious surfaces;
 - Construction BMP Poster;
 - School/Student program incorporates education on controlling soil erosion;
 - The “After the Storm” and Storm Water Pollution, what you should know brochures
 - General Construction Activities & Outdoor Activities brochure
- Nutrients and pathogens associated with Urban Development and Land Uses
 - Specific section on construction, municipal, industrial/commercial and new development training focusing on the need to address increased nutrients within the watershed;
 - Pet Waste “What’s the Scoop” brochure;
 - Partnership with SGA Advertising to place pet waste information in pet stores, veterinarian clinics, kennels and pet grooming facilities;
 - Coordination with Riverside County Animal Control Department to distribute “What’s the Scoop” and “After the Storm” brochures to families adopting pets;
 - The Agricultural Commissioner assist in educating on water conservation, fertilizer management and integrated pest management practices. In conjunction with County Waste Management’s Composting Workshop, the “After the Storm” brochure and

- Household Hazardous Waste flyer is included in the adult informational packet.
- "Keep Our Water Clean" video to cover proper use of fertilizers as well as excess runoff from sprinklers;
 - Earth Day mailing inserts were developed to inform residents about the problem of storm water pollution and provide simple pollution prevention activities in gardening;
 - Adult presentations conducted by RCRCDD discussing the effects of fertilizers and pesticides on local waterways;
 - The "After the Storm" brochure; and
 - Construction BMP Activities brochure and poster.

In addition, the District has developed other outreach materials to focus on other pollutants and pollutant causing activities/businesses commonly associated with urban runoff. Outreach methods can be combined to focus on specific pollutants that may exist within the watershed.

24-hour Watershed-Wide Outreach Portals

The Permittees maintain three 24-hour/7 days per week watershed wide portals to receive and distribute information regarding the "Only Rain Down the Storm Drain" program. These portals include a website, 1-800 number, and an e-mail address.

Storm Water Protection Program Website

The District operates a website that provides information on how to report illegal dumping, clogged storm drains, facility signage and worn or missing curb markers, as well as provide information on upcoming activities, opportunities for public participation in program development and general information about Urban Runoff pollution prevention techniques. The website is located at:

<http://www.floodcontrol.co.riverside.ca.us/stormwater/>

Almost all of the District's outreach materials have been scanned into an electronic .pdf format and are available for download. Online Order forms and phone numbers are also available to assist in obtaining information that might not be available online.

The website contains pages specific to the following target audiences:

- General Public/Residents
- Businesses
- Developers
- Contractors
- Schools and Teachers
- Kids Page

In addition the website contains links to:

- Assist viewers in locating their watershed
- An online media library
- Materials order form
- 1-800 information to report storm drain pollution

The District tracks the number of hits to its public education website. The website was completely revamped during the previous reporting period and the web-page counter replaced this reporting period. Results of the webpage counter report are included in **Appendix E**.

Storm Water toll free 1-800 Hotline

On October 1994, a Toll Free “800” telephone number for reporting suspected Urban Runoff pollution and obtaining pollution prevention information was established.

1. This call line offers easy to understand instructions for connecting to County Environmental Health or Waste Management to obtain grasscycling, composting, or household hazardous waste collection dates and locations.
2. The 24-hour Hotline also allows callers to report clogged catch basin inlets, illegal dumping and other illicit discharge violations.
3. Finally, the hotline allows people to order public education materials and/or request storm water presentations for schools or community groups. The Permittees advertise the hotline in all appropriate County telephone directories, public education outreach materials, and in other appropriate venues and locations. Callers to the hotline are given options to seek emergency services if the spill is of a suspicious origin or a safety issue.

The 1-800 line diverts callers to appropriate Permittee departments based on caller selections. Callers requesting information on pollution collection activities are diverted to either County Environmental Health or Waste Management depending on their specific selection. Callers reporting illicit discharges are directed to County Code Enforcement, who accepts the calls and then re-directs them to appropriate Permittee Code Enforcement Departments. Calls for public education materials or presentations are directed to the district’s front desk and then to the District’s Public Education Staff. School presentation inquiries are directed to the Riverside County Conservation District office, who have been contracted to provide education to elementary schools in the Santa Ana Region. The specific text to the hotline is included as **Exhibit A**.

The provider of the 1-800 line, Riverside County Communication, tracks the number of incoming calls to the line. This tracking mechanism was discontinued during past reporting period but restored this reporting period.

Exhibit A

“ONLY RAIN DOWN THE STORM DRAIN” POLLUTION PREVENTION PROGRAM
TOLL FREE 1-800 LINE DIALOGUE

Thank you for calling the “Only Rain Down the Storm Drain” Pollution Prevention Program. To better serve the needs of our County communities, please listen carefully to the following options:

If this is an emergency, or you wish to report a significant release or threatened releases of hazardous material into the storm drain or elsewhere in the environment, please hang up and immediately Dial 911.

(Si esta llamada es una emergencia o desea reportar desechos de contaminantes peligrosos en las alcantarillas o en el medio ambiente, por favor cuelge y llame 911.)

For water service connection, disconnection, or any other water utility information, call your local water service provider.

To report illegal dumping at residential, commercial, industrial or construction sites, please call Environmental Health at 951.955.8982, or press #1 to be directly connected.

For information regarding Household Hazardous Waste Collection Events, please Press #2.

To report clogged storm drains, please call your local municipal public works department. To report faded or missing “Only Rain Down the Storm Drain” storm drain markers, please press #3.

For General or specific business pollution prevention information or to receive other pollution prevention information please press #3.

(Drop Off Dialogue)

Thank you for your interest in obtaining information on storm drain pollution protection. Basic, construction, industrial, commercial and children’s storm water protection outreach packets are available. For a quick response to your request, please slowly and clearly leave your name, address, city and zip code. Also state the type and quantity of the materials you are interested in receiving. Should you need additional assistance, provide your area code and phone number and someone will contact you as soon as possible.

To inquire about our free storm water classroom presentations, workshops, youth group activities and other outreach programs, please press #4.

(Drop Off Dialogue)

The “Only Rain Down the Storm Drain” public education program offers classroom presentations, workshops, youth group activities, special event opportunities and other programs. For inquiries for the Temecula or Murrieta area, please press #1 (Drops to Mission Resource Conservation District)

For inquiries in all other Riverside County areas, press 2 (drops to Riverside/Corona Resource Conservation District).

For Grasscycling and composting information or workshops, please PRESS #5. (to 951.486.3200)

For additional assistance regarding our storm drain pollution prevention program during regular business office hours, Monday through Thursday from 7:30 am to 5:30 pm and on Friday from 7:30 am to 4:30 pm

E-mail

The Permittees also maintain an e-mail address that can be used to report illicit discharges or request storm water related public information. The e-mail address is:

Flood.fcnpdes@co.riverside.ca.us

E-mails are received by the District's Public Information Specialist and are responded to, in most cases, within 2 business days.

Program Coordination with other Stakeholders

The "Only Rain Down the Storm Drain" program has used partnerships to leverage and increase available resources. The Permittees utilize every opportunity to work with Co-permittees, local environmental groups, and other public, private and business organizations to maximize use of existing distribution outlets, events, programs and materials. Impressions, attendance, and other measures of effectiveness relative to these programs are included in **Appendix E** (Public Education) of this Watershed Annual Report.

To facilitate statewide awareness of storm water public education, educate local and state decision makers, and assist in the development of more effective public education outreach programs, the District participates in the following public education committees:

- Public Information Public Participation Committee (PIPP) – A subcommittee of the California Storm Water Quality Association, and
- Western Regional Pollution Prevention Network (WRPPN)

To leverage education outreach resources and coordinate public education activities with other environmental programs, the Permittees closely coordinate and/or have existing partnerships with the following entities/organizations:

- Household Hazardous Waste Information Exchange (HHWIE); This is an eGroup that provides household hazardous waste affiliates the ability to better communicate, share ideas and the latest in legislative rulings.
- Riverside-Corona Resource Conservation District (RCRCD);
- Partnership to provide student education outreach in the Santa Ana and Whitewater Watersheds
- Partnership to provide adult education outreach activities in the Santa Ana and Whitewater Watersheds
- Partnership to provide support services for public education outreach activities at community events
- Mission Resource Conservation District (RCRCD);
- Partnership to provide student education outreach in the Santa Ana and Santa Margarita Watersheds
- Partnership to provide adult education outreach activities in the Santa Ana and Santa Margarita Watersheds

- Partnership to provide support services for public education outreach activities at community events
- California Regional Environmental Education Community Network (CREEC)
 - A network whose mission is to develop a communication network which provides educators with access to high quality environmental education resources to enhance the environmental literacy of California students.
- Santa Ana River Watershed Clean Up Stakeholders Group in coordination with Riverside Corona Conservation District, Keep Riverside Clean and Beautiful and the California Coastal Commission's Coast. This collaboration of environmental partners support and encourage volunteers, allies and groups to gather for a day to remove trash and debris from the Santa Ana River that might otherwise flow downstream, through the river to the ocean.
- In addition the "Only Rain Down the Storm Drain" program also coordinates with the following City/County departments to distribute appropriate storm water education outreach materials:
 - City/County/District Front Counters
 - County Waste Management
 - County Public Health Department
 - Agriculture Department
 - County Executive Offices
 - Code Enforcement
 - County Parks
 - Animal Control;
 - Economic Development Agency
 - County Assessor/Recorders Office
 - Bio-terrorism
 - Fleet Services
 - Human Resources
 - Library System
 - Central Mail
 - Stamp on every piece of mail sent by the County that identifies the 1-800 Number and requests that citizens call it to report storm drain pollution.
 - County Safety
 - County DPSS
 - Transportation and Land Management

In general, brochures and promotional items are provided to these departments for distribution in public lobbies, training sessions, through customer interactions and new employee orientations.

Finally, the "Only Drain Down the Storm Drain" Program also coordinates with the following state and/or local government or business entities to distribute public education information:

- Western Riverside Council of Governments
- Santa Ana Regional Water Quality Control Board
- Orange County Watershed & Coastal Resources Division
- Santa Ana Watershed Association
- South Coast Air Quality Management District
- Santa Rosa Plateau
- Bureau of Reclamation
- Elsinore Valley Municipal Water District
- Metropolitan Water District
- Lake Elsinore/San Jacinto Watershed Authority
- Eastern Municipal Water District
- The Water Education Center
- Rancho California Water District
- Valley Greeters
- Department of Water Resources Southern District
- Western Municipal Water District
- Business Industrial Association (BIA)
- Caltrans

Outreach Tools to Change Public Behavior

The “Only Rain Down the Storm Drain” program conducts a wide range of outreach activities to residents, students, community groups, new home owners, homeowner associations; informing them of how their “everyday activities” may contribute to the pollution of Receiving Waters, and encouraging them to adopt alternatives that will lessen or eliminate pollution-causing behaviors. Program efforts include providing information on pollution prevention techniques and informing residents about the proper disposal of household hazardous wastes, construction materials, used motor oil, pet waste and litter. Public education materials and media emphasize the theme that all citizens have a role to play in reducing and preventing the polluting of Receiving Waters. The goal is to present a clear and consistent message that explains the simple connections between people’s everyday activities and their impacts upon Receiving Water quality.

As the public education and outreach program continues to be implemented and enhanced, the Permittees hope to broaden public awareness of Urban Runoff quality problems, promote proper disposal of household hazardous waste and motor oil, encourage illegal discharge reporting, foster good stewardship of Receiving Waters, and take personal responsibility for their actions in preventing pollution.

While public education outreach at events indicates that most people are willing to act in an environmentally responsible manner if given simple ways to change their behavior to avoid polluting our water bodies; most are unaware of the sources of pollution from everyday urban land use. The “Only Rain Down the Storm Drain” pollution prevention program using various media forms educates the County’s population about modified behaviors to prevent storm water pollution by focusing on residents, general public, students, home gardeners, do-it-yourselfers, mobile businesses, etc.

Direct Outreach Methods

The “Only Rain Down the Storm Drain” program interfaces directly via program staff, or through contracts and partnerships, to the public through attendance at community events, school education programs, adult education programs and/or by providing classroom based training. Specific outreach activities, segregated by target audiences, are described below.

General Community Outreach

The “Only Rain Down the Storm Drain” program participates in various community events to ensure that our message is delivered to the largest possible municipal audience. At these community events, surveys, to assess overall program effectiveness, have been used.

In addition, the “Only Rain Down the Storm Drain” program has partnered with County Environmental Health to ensure that a storm drain pollution prevention material is available and distributed at all Household Hazardous Waste and Antifreeze, Batteries, Oil and Paint Collection Centers and/or Events throughout each of the Watershed Region’s within Riverside County. These events provide free disposal sites for receiving common pollutants that can impair Receiving Waters.

Elementary School Outreach

Elementary (K-6)

The Riverside County Resource Conservation District (RCRCD) continues to provide a variety of K-6 education programs for the “Only Rain Down the Storm Drain” Program. The K-6 education program includes materials such as the Storm Water Pollution Prevention Patrol workbook, the Fancy Fin hands-on classroom presentation and accompanying coloring book, various word match and crossword activity sheets and videos. A second story line featuring Fancy Fin and her friend Phinnious J. Green (a Pacific Tree Frog) educate students about point and non-point pollution and their effects on the environment and other creatures in the watershed. School materials are offered to all public and provide schools in the Santa Ana Watershed Region, as well as to youth groups such as the boy and girl scouts.

Secondary Schools

A video entitled “How to Conduct an Environmentally Friendly Car Wash and Make Money Too” was developed for the “Car Wash Challenge” program. An accompanying flyer is also used which informs students/groups of the potential storm water problems generated from car wash runoff, and provides practical BMPs to minimize or eliminate contaminated runoff. The original focus of the program was high school clubs. However, after contacting several high schools, it was discovered that car washing fundraisers are relatively rare and revenue deficient in comparison with other high

school fund raising activities. Nevertheless, church groups, scout troops and other organizations do conduct car wash fundraisers. Thus, the scope of the Car Wash Challenge program has been expanded to include these additional fundraising organizations.

Adult Outreach

Valley Greeters is a “Welcoming Wagon” business taking discount coupons, product samples and general vicinity information door to door to new residents and homeowners to the Temecula, Murrieta and Lake Elsinore area. For the past four years, Valley Greeters has included our MS4 materials, (After the Storm; What’s the Scoop; Pool, Spa and Fountain Maintenance and HHW Collection Schedule). This information is accompanied with a handy full size dustpan, shop cloth and vehicle air freshener. Every material and promotional is clearly imprinted with the 1-800 Toll Free number for reporting illegal discharges into the storm drain. Young family members receive a copy of Fancy Finn and box of crayons. This business is solely dependent on the status of the construction economy and by January, 07 experienced a considerable slowdown.

The “Only Rain Down the Storm Drain” program contracts with the Riverside/Corona Resource Conservation District for public outreach. Storm Water Pollution Prevention presentations are given to community groups who call and request such services.

Steve Groner & Associates has been retained to prepare and present workshops at major home improvement stores throughout Riverside County. The workshops include passing out reading material regarding targeted BMPs to the public through established corporate partnerships (paint, hardware, home show coordinators, home improvement, garden centers, nurseries and pet stores). All commercial employees are informed about storm water impacts that could occur from the improper application of all types of home and garden hazardous chemicals. In turn, the employees are then able to share with customers on the proper use and disposal of products that are potential storm drain pollutants. Attendees at the workshop receive “Only Rain Down the Storm Drain” promotionals to help emphasize the storm water pollution prevention message. Fixed advertising tools such as counter displays, tear sheets have been placed throughout to attract attention.

Brochures

Residential: After the Storm; Storm Water Pollution and the Solutions, Household Hazardous Waste Collection Schedule, Outdoor Activities; Swimming Pool, Jacuzzi and Fountain Maintenance; and What’s the Scoop (Pet waste).

Outreach Materials

In addition to the brochures mentioned above, the program utilizes other effective outreach materials such as, magnets, a billboard ad, videos, newspaper supplements, flyers, door knob hangers, calendars, promotional items, workbooks, curriculum, shop rags, shelf talkers, tear sheets, posters and print ads to cultivate interest in the program.

A door hanger is also being utilized to help address problem discharges that are commonly observed in residential settings. The door hanger notifies the recipient that a problem discharge was observed flowing in to the street and offering help by following recommended pollution prevention activities. The door hanger is provided to all cities and is used by various County departments and the NPDES staff when conducting field or site activities/inspections.

Mailing Inserts/Slugs

The “Only Rain Down the Storm Drain” Pollution Prevention Program encourages advertising the County’s Household Hazardous Waste Collection events via the use of mail inserts. The inserts are included in various utility bills and special notice mass mailings.

In addition, the “Only Rain Down the Storm Drain” program has coordinated with the County Mail Department to have the postage meter carry the “Only Rain Down the Storm Drain” message and the 1-800 Toll Free number to report an illegal storm drain disposal or spill. In 05/06, over 5,000,000 pieces of outgoing County mail were stamped with the message. In November of 06, the postage system was replaced with more sophisticated postage meter units but the cost of the ink in the new system far exceeded the costs and benefits from other media options and therefore this media venue was dissolved.

Media Outreach

The “Only Rain Down the Storm Drain” Program continues to utilize various mass media to reach the public and promote the storm water pollution prevention. Special newspaper inserts, fliers, and advertisements help increase public awareness of storm water pollution and environmental protection.

- Our Sixth Edition of a four-page insert called the National Pollution Prevention or P-2, (National Pollution Prevention Week recognition), was distributed Countywide through the PennySaver. The insert included topics on proper disposal of pet waste, pesticide alternatives, motor oil recycling, grass-cycling, pool and spa best management practices, storm drain marking program, storm water school presentations, general storm drain pollution protection, business storm water pollution information, household hazardous waste (HHW) collection events, syringe disposal program, composting workshops and motor oil specific recycling locations. The insert is released to over 650,500 Riverside County homes generating an increase of calls to the 800 Toll Free Hotline and District IC/ID investigations.

Cooperative Used Oil Program

The Western Riverside Council of Governments (WRCOG) is responsible for administering the Used Oil Block Cycle Grant on behalf of ten cities within WRCOG’s boundaries. These cities include: Banning, Beaumont, Canyon Lake, Lake Elsinore, Murrieta, Norco, Perris, Riverside, San Jacinto and Temecula.

The objective of the Used Oil Block Grant is to make it convenient for Do-It-Yourselfers (DIYers) to recycle their used oil and to make it easy for them to find a Certified Center accepting used oil. In order for these centers to be certified, they need to apply for certification with the California Integrated Waste Management Board (CIWMB). As a grant recipient, WRCOG contacts non-certified centers in the jurisdiction to interest them in becoming certified used motor oil collection center. The goal is to see a significant decrease in the amount of illegally dumped motor oil by adding more oil collection centers within close proximity to users.

Through the same grant funding source, WRCOG also provides used oil containers for distribution to DIYers who need proper containers for automotive fluids. Through WRCOG efforts, all certified centers in the County are in compliance to state and local mandates.

The Storm Drain Pollution Prevention Program assists WRCOG's efforts by making available our MS4 information and supporting promotionals for distributions to their targeted groups.

At various venues, WRCOG staff obtain participant responses to a ten question survey. The survey examines the public's understanding on:

- used oil recycling,
- used oil drop-off locations,
- curbside programs, and other local recycling programs.

The program also maintains an English and Spanish 800 hotline that can be used to get answers to any recycling question a resident may have regarding, "where the nearest Certified Center is located?" and "where can I find a used oil container?". The phone number is printed on all distributed materials including the oil containers.

Cleanest County in the West Program

Through another grant funding source, WRCOG created the "Cleanest County in the West" program to address issues relating to litter and illegal dumping. The program was designed to assist jurisdictions in meeting the 50% diversion goals mandated by Assembly Bill 939. AB 939 was a state mandate signed in 1989 that required cities to reduce their waste by 50% by the Year 2000.

The core of the program is the elementary school assembly. WRCOG partners with Radio Disney AM 1290 to present an interactive and informational presentation for children in grades K-6th. This program continually reinforces the responsibility of everyone to recycle and pick up litter.

WRCOG at the end of the assembly gives the school two recycling containers for the collection of cans and bottles. During the 06/07 school year, over 18,000 students and 600 teachers have experienced the assembly. Each student receives an environmental activity book and an application to join the Riverside County Kids Recycle Club where they will receive a quarterly newspaper. This club has over 200 members.

Like the “Only Rain Down the Storm Drain” Program which promotes litter reduction and recycling throughout the Santa Ana Region, WRCOG also participates in events to promote litter reduction and beverage container recycling. These events gives staff an opportunity to assess how informed the local community is regarding recycling and also allows us to distribute brochures and informational flyers that will assist people in finding the nearest recycling center. During these events promotional items made from recycled content are also given out to show examples on how used items such as money can be recycled into new things such as a pencil, a promotional product first used by the “Only Rain Down the Storm Drain” Program. This particular promotional item especially increases the interest of the people visiting out booth and demonstrates how almost anything can be recycled and reused.

Outreach tools specific to Business Specific

The “Only Rain Down the Storm Drain” Program conducts a wide range of outreach activities to businesses; informing them of how their “everyday activities” may contribute to the pollution of Receiving Waters, and encouraging them to adopt alternatives that will lessen or eliminate polluting-causing activities. Program efforts include providing information on pollution prevention techniques and informing businesses about the proper disposal of wastes. Public education materials and media emphasize the theme that all businesses have a role to play in reducing and preventing the polluting of Receiving waters. The goal is to present a clear and consistent message that explains the simple connections between a business’ everyday activities and their impacts upon Receiving Water quality.

Originally, the business education program mainly consisted of the development and distribution of formal BMP guidance and outreach to business associations. The program has now expanded to include direct outreach to businesses through classroom formats, advertising in business trade papers and providing exhibits at various business specific symposiums.

Discussion of the current Business Specific Outreach tools implemented by the Permittees are discussed below.

Direct Business Outreach Activities

The “Only Rain Down the Storm Drain” Program partners with various entities to provide training and education. Currently, the District has allowed AEI-CASC Engineering, a consultant who provides the Permittees internal education programs to train developers and consultants regarding the new WQMP/SUSMP requirements for Riverside County. The District has partnered with Riverside/Corona Resource Conservation District, to develop a Water Quality Design class that focuses on sub-regional solutions and low impact development. This class was offered for the first time through UCR extension in October 2005. Additionally, the District presented at Construction Storm Water Compliance Workshop hosted by the Building Industry Association of Southern California (BIA/SC) on March 22, 2006. The workshop focused on state and municipal construction requirements for contractors, developers, and consultants.

Through the Compliance Assistance Program (CAP), a partnership with County Environmental Health restaurants and businesses that handle hazardous wastes are reviewed for potential storm water impacts from their activities. Each business is provided with storm drain pollution prevention public education outreach information specific to their activities.

Steve Groner Associates has been retained to prepare and present workshops at major home improvement stores throughout Riverside County. The workshops include a handout educating the store's employees about storm water impacts that could occur from improper application of paint, pesticides or fertilizers. Attendees at the workshop also receive "Only Rain Down the Storm Drain" information and promotionals to help highlight the storm water protection message. Employees are then able to share with customers the proper use and disposal of products that are potential storm drain pollutants. Point of purchase displays, tearsheets, and counter displays have been installed at strategic locations to educate the public directly.

Each new business trade in Riverside County that is listed in the Inland Business Press newspaper is provided with an "Only Rain Down the Storm Drain" Pollution Prevention packet.

Brochures

Commercial: After the Storm; Food Facilities; Outdoor Cleaning Activities and Non-Point Source Discharges; Automotive Maintenance & Car Care. Note: (Staff is revising the Outdoor Activity brochure to include broader examples of urban pollution causing activities such as, power washers and mobile vehicle maintenance operators).

Industrial: After the Storm; Outdoor Cleaning Activities and Non-Point Source Discharges; and Your Facility May Need a Storm Water Permit.

Construction: After the Storm; Outdoor Cleaning Activities and Non-Point Source Discharges; General Construction & Site Supervision The revision to the construction brochure is pending the finalization of the construction permit.

Posters

BMP posters for automotive, food service establishments (available in Spanish) and construction employees are available. The posters address activities associated with the automotive repair industry, and the food/restaurant industry that may pose a threat to water quality. There are also two new posters for the Fueling Stations and Service Bay Service centers. All the posters recommend storm water BMPs and are designed to serve as informative and attractive visual reminders for employees.

Media Outreach

In March, 07, a full-page ad was placed in the Inland Business Press newspaper to draw the attention of Inland Empire businesses whose urban runoff activities might be threatening local

water quality. The ad also provided links to the District's and CASQA's website for more detailed BMP information.

Supplemental Environmental Projects (SEP)

In an effort to change the behaviors of large storm drain pollution prevention offenders in the County, Environmental Health established a Supplemental Environmental Project (S.E.P.). The S.E.P. requires from the violator a monetary fine and/or the violator's cooperation for the development of a public education tool on the effects of polluted urban run off. S.E.P.'s to date include:

- A Downs Energy SEP project resulted in the development of a billboard ad that has been greeting commuters traveling Westbound on the 60 Freeway lanes.

Outreach tools specific to Pollutants

“Only Rain Down the Storm Drain” Pollution Prevention Program conducts a wide range of outreach activities focusing on reduction of certain pollutants in the receiving waters. These outreach activities focus on sources of those pollutants whether it is residential, business, municipal or some other state or federal source. Education materials explain how “everyday activities” of potential sources may contribute to the pollution of receiving waters, and encourage the sources to adopt alternative approaches to pollutant management that will lessen or eliminate polluting-causing activities. Program efforts include providing information on pollution prevention techniques and informing sources about the proper disposal of pollutants. Public education materials and media emphasize the theme that all citizens/businesses have a role to play in reducing and preventing the polluting of receiving waters. The goal is to present a clear and consistent message that explains the simple connections between a business' everyday activities and their impacts upon receiving water quality.

Each subsection that follows identifies how existing outreach materials previously described address specific potential pollutant sources in the watershed.

Use of pesticides, fertilizers, and herbicides

- A. The Riverside County Agricultural Commissioner's Pesticide Applicator's License renewal information package includes materials on the proper use of pesticides and offers information on training workshops. The license renewal process requires continuing education of applicants and detailed record keeping of pesticide applications. Municipal employees that are responsible for the application of pesticides are encouraged to obtain and maintain credentials as Certified Applicators and/or licensed Pest Control Advisors.
- B. The "Home Garden Care" materials are being revised to draw and attract the interest of the general public and amateur gardener. The new materials will include Integrated Pest Management and plant selection and materials from the State Water Resource Control Board, Central Contra Costa IPM Outreach Program, University of California and The

PROGRAM IMPLEMENTATION

Orange County Storm Water Program are being used. All the materials selected offer alternatives to using chemically based pesticides, herbicides and fertilizers.

- C. The "Keep Our Water Clean" video covers proper use of pesticides, fertilizers and herbicides as well as excess runoff from sprinklers.
- D. The September annual "Only Rain Down The Storm Drain's" participation in the National Pollution Prevention Week insert informs residents about the problem of storm water pollution and provides simple pollution prevention activities in gardening.
- E. The "Only Rain Down The Storm Drain" adult presentations conducted by RCRCDC discusses the effects of pesticides and fertilizers on local waterways. The materials distributed following the presentation promote alternatives to pesticide use in the yard and garden.
- F. The 2006 Environmental Calendar included a wide array of storm water protection information. It is designed to attract the adult audience by listing best management practices, scheduled special events, household hazardous waste collection sites, used oil collection sites, composting workshops, citywide clean ups, and each of the watersheds along with geographical information. Throughout the calendar the main message is "Only Rain Down The Storm Drain" and the hotline number to call for additional home garden care information.
- G. Steve Groner Associates has been retained to prepare and present employee workshops at major home improvement stores throughout Riverside County. This information is then passed on to the public via the shelf talkers accessible to the public or when an employee is addressed with a question. The workshops include information on BMPs the public should be aware of for pesticide and fertilizer application, use, and storage.

Appendix E

Soils Report

Appendix F

Site Design BMP Sizing and Hydrologic Data

TENTATIVE TRACT MAP NO. 37639 – DSRT SURF
IN THE CITY OF
PALM DESERT, CA

PRELIMINARY HYDROLOGY REPORT

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DECEMBER 3, 2018

Prepared Under the Supervision of:

12/3/18

James R. Bazua, PE
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Expiration Date: December 31, 2018



TRACT MAP NO. 37639 – DSRT SURF
PRELIMINARY HYDROLOGY REPORT

TABLE OF CONTENTS:

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- II DESIGN METHODOLOGY**
- III DESIGN FLOWRATES – RATIONAL METHOD**
- IV STORM DRAIN SYSTEM SIZING CALCULATIONS**
- V APPENDIX - REFERENCE MATERIAL**

I. PURPOSE AND SCOPE

The Preliminary Hydrology Report is prepared in support of the Tentative Tract Map and Preliminary WQMP submittal for the DSRT Surf Resort project. This report provides a discussion of the preliminary drainage design strategy based on the Runoff Management Plan prepared by Mainiero, Smith and Associates, Inc. (February 12, 1997) for the existing adjacent South Golf Course within Desert Willow Resort.

The DSRT Surf project is proposed to be built on a vacant 17.8 acre parcel within the existing Desert Willow Resort in Palm Desert, CA. The vacant pad is located west of existing Desert Willow Drive, near the roundabout and drop off area serving the existing clubhouse facilities. In general, Desert Willow is bounded by Cook Street and adjacent residential/commercial development to the east; Portola Avenue to the west; Country Club Drive to the south; and Frank Sinatra Drive to the north. Access to the DSRT Surf project will be located south of the existing clubhouse with access off the Desert Willow Drive Roundabout. DSRT Surf will be constructed with a 6.1 acre surf lagoon located in the center of the development with two-three story hotels and several residential villas located around the perimeter. The DSRT Surf development will disturb all of the vacant parcel on which it is to be constructed.

The South Golf Course Runoff Management Plan provides details quantifying the retention capacity of South Golf Course concluding that “The retention areas provided within the golf course fairways provide adequate capacity for the 100 year runoff from all drainage areas”. The South Golf Course Runoff Management Plan also includes a Hydrology Map (Section V – Appendix) illustrating the location of areas within the golf course designated for the collection of storm runoff. Under both existing and developed conditions, storm drain runoff generated on-site is designed to be conveyed to the adjacent South Golf Course via an underground storm drain piping system in a similar manner to the systems employed by existing adjacent resort developments. The Hydrology Site Plan included in the Appendix of this report shows the preliminary location of three main underground systems designed to outlet on-site runoff to the adjacent golf course in a manner consistent with the existing South Golf Course Runoff Management Plan. In terms of Water Quality Management Plan terms, the 6.1 acre Surf Lagoon will act as a “self-treating area” since no rainfall tributary to the Lagoon will result in runoff. Instead, the proposed Surf Lagoon is designed to be evacuated frequently via a 16 inch gravity flow pipe that will convey water stored in the Lagoon to a South Golf Course lake within Desert Willow Resort.

II. DESIGN METHODOLOGY AND CALCULATIONS

This report includes:

- 1) A description of the drainage strategy for the DSRT Surf project based on the Desert Willow South Golf Course Runoff Management Plan
- 2) A definition of on-site drainage subareas contributing runoff to three separate South Golf Course drainage collection areas.
- 3) Calculations estimating the anticipated design flowrates generated within each subarea.
- 4) Preliminary level pipe sizing calculations in support of the Preliminary Grading and Utility Design.

DESIGN CRITERIA

The following parameters were used in the preparation of the analyses:

- Antecedant Moisture Condition – 100 year 2
- 100 year – 1 hour Precipitation 1.67” NOAA Atlas 14
- 2 year – 1 hour Precipitation 0.375” NOAA Atlas 14
- Hydrologic Soil Type “A” RCFCD Plate C-1.36
- Slope Intensity Duration Curve 0.58

III DESIGN FLOWRATES – RATIONAL METHOD

SUBAREA 1 (4.9 AC) – 19.6 CFS

SUBAREA 2 (2.06 AC) – 7.9 CFS

SUBAREA 3 (2.4 AC) – 8.3 CFS

SUBAREA 4 (1.13 AC) – 5.0 CFS

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version

7.1

Rational Hydrology Study

Date: 12/07/18

File:SUBAREA1.out

SUBAREA 1 - 100 YEAR STORM EVENT

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6253

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.375(In.)

100 year, 1 hour precipitation = 1.670(In.)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.670(In/Hr)

Slope of intensity duration curve = 0.5800

++++

++++
Process from Point/Station 100.000 to Point/Station

101.000

***** INITIAL AREA EVALUATION *****

Initial area flow distance = 690.000(Ft.)

Top (of initial area) elevation = 271.500(Ft.)

Bottom (of initial area) elevation = 265.000(Ft.)

Difference in elevation = 6.500(Ft.)

Slope = 0.00942 s(percent)= 0.94

TC = k(0.300)*[(length^3)/(elevation change)]^0.2

Initial area time of concentration = 10.420 min.

Rainfall intensity = 4.610(In/Hr) for a 100.0 year storm

COMMERCIAL subarea type
Runoff Coefficient = 0.866
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 32.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 19.556(CFS)
Total initial stream area = 4.900(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 4.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.100
Area averaged RI index number = 32.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version

7.1

Rational Hydrology Study

Date: 12/07/18

File:SUBAREA2.out

SUBAREA 2 - 100 YEAR STORM EVENT

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6253

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.375(In.)

100 year, 1 hour precipitation = 1.670(In.)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.670(In/Hr)

Slope of intensity duration curve = 0.5800

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++++
Process from Point/Station 200.000 to Point/Station

202.000

***** INITIAL AREA EVALUATION *****

Initial area flow distance = 710.000(Ft.)

Top (of initial area) elevation = 268.000(Ft.)

Bottom (of initial area) elevation = 263.000(Ft.)

Difference in elevation = 5.000(Ft.)

Slope = 0.00704 s(percent)= 0.70

TC = k(0.300)*[(length^3)/(elevation change)]^0.2

Initial area time of concentration = 11.171 min.

Rainfall intensity = 4.427(In/Hr) for a 100.0 year storm

COMMERCIAL subarea type
Runoff Coefficient = 0.865
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 32.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 7.888(CFS)
Total initial stream area = 2.060(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 2.06 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.100
Area averaged RI index number = 32.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version

7.1

Rational Hydrology Study

Date: 12/07/18

File:SUBAREA3.out

SUBAREA 3 - 100 YEAR STORM EVENT

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6253

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.375(In.)

100 year, 1 hour precipitation = 1.670(In.)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.670(In/Hr)

Slope of intensity duration curve = 0.5800

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++++
Process from Point/Station 300.000 to Point/Station

303.000

**** INITIAL AREA EVALUATION ****

Initial area flow distance = 1000.000(Ft.)

Top (of initial area) elevation = 272.000(Ft.)

Bottom (of initial area) elevation = 266.000(Ft.)

Difference in elevation = 6.000(Ft.)

Slope = 0.00600 s(percent)= 0.60

TC = k(0.300)*[(length^3)/(elevation change)]^0.2

Initial area time of concentration = 13.228 min.

Rainfall intensity = 4.014(In/Hr) for a 100.0 year storm

COMMERCIAL subarea type
Runoff Coefficient = 0.863
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 32.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 8.312(CFS)
Total initial stream area = 2.400(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 2.40 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.100
Area averaged RI index number = 32.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version

7.1

Rational Hydrology Study

Date: 12/07/18

File:SUBAREA4.out

SUBAREA 4 - 100 YEAR STORM EVENT

***** Hydrology Study Control Information *****

English (in-lb) Units used in input data file

Program License Serial Number 6253

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

2 year, 1 hour precipitation = 0.375(In.)

100 year, 1 hour precipitation = 1.670(In.)

Storm event year = 100.0

Calculated rainfall intensity data:

1 hour intensity = 1.670(In/Hr)

Slope of intensity duration curve = 0.5800

++++

++++
Process from Point/Station 400.000 to Point/Station

404.000

**** INITIAL AREA EVALUATION ****

Initial area flow distance = 310.000(Ft.)

Top (of initial area) elevation = 272.000(Ft.)

Bottom (of initial area) elevation = 270.500(Ft.)

Difference in elevation = 1.500(Ft.)

Slope = 0.00484 s(percent)= 0.48

TC = k(0.300)*[(length^3)/(elevation change)]^0.2

Initial area time of concentration = 8.644 min.

Rainfall intensity = 5.137(In/Hr) for a 100.0 year storm

COMMERCIAL subarea type
Runoff Coefficient = 0.868
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 32.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 5.039(CFS)
Total initial stream area = 1.130(Ac.)
Pervious area fraction = 0.100
End of computations, total study area = 1.13 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.100
Area averaged RI index number = 32.0

IV STORM DRAIN SYSTEM SIZING CALCULATIONS

tmp#8.txt

Manning Pipe Calculator

Given Input Data:

Shape	Circular
Solving for	Depth of Flow
Diameter	24.0000 in
Flowrate	19.6000 cfs
Slope	0.0200 ft/ft
Manning's n	0.0130

Computed Results:

Depth	13.5745 in
Area	3.1416 ft ²
Wetted Area	1.8325 ft ²
Wetted Perimeter	40.8572 in
Perimeter	75.3982 in
Velocity	10.6960 fps
Hydraulic Radius	6.4584 in
Percent Full	56.5605 %
Full flow Flowrate	31.9929 cfs
Full flow velocity	10.1837 fps

Critical Information

Critical depth	19.0926 in
Critical slope	0.0062 ft/ft
Critical velocity	7.1198 fps
Critical area	2.7529 ft ²
Critical perimeter	51.8843 in
Critical hydraulic radius	7.6404 in
Critical top width	24.0000 in
Specific energy	2.9093 ft
Minimum energy	2.3866 ft
Froude number	1.9707
Flow condition	Supercritical

SUBAREA 2 - 24IN PIPE

tmp#9.txt

Manning Pipe Calculator

Given Input Data:

Shape	Circular
Solving for	Depth of Flow
Diameter	24.0000 in
Flowrate	7.9000 cfs
Slope	0.0050 ft/ft
Manning's n	0.0130

Computed Results:

Depth	11.9131 in
Area	3.1416 ft2
Wetted Area	1.5563 ft2
Wetted Perimeter	37.5253 in
Perimeter	75.3982 in
Velocity	5.0761 fps
Hydraulic Radius	5.9722 in
Percent Full	49.6379 %
Full flow Flowrate	15.9965 cfs
Full flow velocity	5.0918 fps

Critical Information

Critical depth	12.0005 in
Critical slope	0.0049 ft/ft
Critical velocity	5.0290 fps
Critical area	1.5709 ft2
Critical perimeter	37.7001 in
Critical hydraulic radius	6.0002 in
Critical top width	24.0000 in
Specific energy	1.3932 ft
Minimum energy	1.5001 ft
Froude number	1.0145
Flow condition	Supercritical

SUBAREA 3 - 24IN PIPE

tmp#10.txt

Manning Pipe Calculator

Given Input Data:

Shape	Circular
Solving for	Depth of Flow
Diameter	24.0000 in
Flowrate	8.3000 cfs
Slope	0.0050 ft/ft
Manning's n	0.0130

Computed Results:

Depth	12.2660 in
Area	3.1416 ft2
Wetted Area	1.6151 ft2
Wetted Perimeter	38.2311 in
Perimeter	75.3982 in
Velocity	5.1389 fps
Hydraulic Radius	6.0835 in
Percent Full	51.1082 %
Full flow Flowrate	15.9965 cfs
Full flow velocity	5.0918 fps

Critical Information

Critical depth	12.3149 in
Critical slope	0.0049 ft/ft
Critical velocity	5.1131 fps
Critical area	1.6233 ft2
Critical perimeter	38.3290 in
Critical hydraulic radius	6.0986 in
Critical top width	24.0000 in
Specific energy	1.4326 ft
Minimum energy	1.5394 ft
Froude number	1.0082
Flow condition	Supercritical

SUBAREA 4 - 18IN PIPE

tmp#11.txt

Manning Pipe Calculator

Given Input Data:

Shape	Circular
Solving for	Depth of Flow
Diameter	18.0000 in
Flowrate	5.0000 cfs
Slope	0.0050 ft/ft
Manning's n	0.0130

Computed Results:

Depth	10.8138 in
Area	1.7671 ft2
Wetted Area	1.1088 ft2
Wetted Perimeter	31.9270 in
Perimeter	56.5487 in
Velocity	4.5096 fps
Hydraulic Radius	5.0008 in
Percent Full	60.0768 %
Full flow Flowrate	7.4277 cfs
Full flow velocity	4.2032 fps

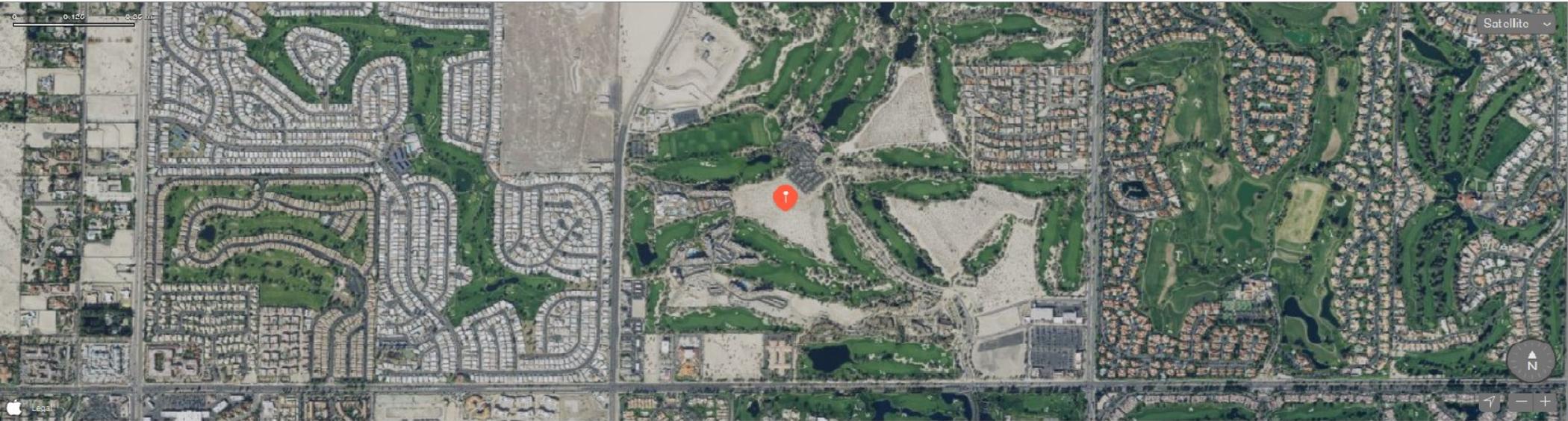
Critical Information

Critical depth	10.3225 in
Critical slope	0.0057 ft/ft
Critical velocity	4.7670 fps
Critical area	1.0489 ft2
Critical perimeter	30.9192 in
Critical hydraulic radius	4.8849 in
Critical top width	18.0000 in
Specific energy	1.2161 ft
Minimum energy	1.2903 ft
Froude number	0.9258
Flow condition	Subcritical

Calculations are provided in this section of the Preliminary Hydrology Report based on the design peak flowrates for each of four subareas within the DSRT Surf project and the anticipated outlet pipe sizes conveying collected flows to the off-site Golf Course drainage basins using Manning's Equation for conduits flowing partially full.. These preliminary results show that subareas 1-3 can easily convey peak design flowrates in a 24inch conduit flowing partially full and subarea 4 can easily convey peak design flowrates in an 18inch conduit flowing partially full.

V APPENDIX – REFERENCE MATERIAL

Latitude and Longitude of a Point



Clear / Reset

Remove Last Blue Marker

Center Red Marker

Get the Latitude and Longitude of a Point

When you click on the map, move the marker or enter an address the latitude and longitude coordinates of the point are inserted in the boxes below.

Latitude:
Longitude:

	Degrees	Minutes	Seconds
Latitude:	<input type="text" value="33"/>	<input type="text" value="15"/>	<input type="text" value="50.1651"/>
Longitude:	<input type="text" value="-116"/>	<input type="text" value="22"/>	<input type="text" value="2.877"/>

Show Point from Latitude and Longitude

Use this if you know the latitude and longitude coordinates of a point and want to see where on the map the point is.

Use: + for N Lat or E Long - for S Lat or W Long.

Example: +40.609060 -74.044636

Note: Your entry should not have any embedded spaces.

Decimal Deg. Latitude:

Decimal Deg. Longitude:

Show Point

Example: **+34 40 50.12** for *34N 40' 50.12"*

	Degrees	Minutes	Seconds
Latitude:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Longitude:	<input type="text"/>	<input type="text"/>	<input type="text"/>



NOAA Atlas 14, Volume 6, Version 2
Location name: Palm Desert, California, USA*
Latitude: 33.7651°, Longitude: -116.3667°
Elevation: 267.49 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.064 (0.053-0.078)	0.099 (0.082-0.120)	0.153 (0.127-0.186)	0.203 (0.167-0.249)	0.283 (0.225-0.359)	0.355 (0.277-0.460)	0.439 (0.334-0.584)	0.538 (0.397-0.736)	0.698 (0.494-0.997)	0.879 (0.600-1.30)
10-min	0.092 (0.077-0.111)	0.142 (0.118-0.172)	0.219 (0.182-0.266)	0.291 (0.239-0.357)	0.406 (0.323-0.515)	0.509 (0.396-0.660)	0.629 (0.478-0.837)	0.771 (0.570-1.06)	1.00 (0.708-1.43)	1.26 (0.860-1.86)
15-min	0.111 (0.093-0.134)	0.172 (0.143-0.208)	0.265 (0.220-0.322)	0.352 (0.290-0.431)	0.491 (0.390-0.623)	0.615 (0.479-0.798)	0.761 (0.578-1.01)	0.933 (0.689-1.28)	1.21 (0.856-1.73)	1.52 (1.04-2.25)
30-min	0.170 (0.141-0.205)	0.262 (0.218-0.318)	0.404 (0.336-0.492)	0.537 (0.442-0.659)	0.749 (0.596-0.951)	0.940 (0.732-1.22)	1.16 (0.883-1.55)	1.43 (1.05-1.95)	1.85 (1.31-2.64)	2.33 (1.59-3.44)
60-min	0.243 (0.202-0.294)	0.375 (0.313-0.455)	0.579 (0.481-0.704)	0.769 (0.633-0.944)	1.07 (0.854-1.36)	1.35 (1.05-1.75)	1.67 (1.26-2.21)	2.04 (1.51-2.79)	2.65 (1.87-3.78)	3.33 (2.28-4.93)
2-hr	0.340 (0.284-0.412)	0.511 (0.426-0.620)	0.768 (0.638-0.935)	1.00 (0.827-1.23)	1.37 (1.09-1.74)	1.69 (1.32-2.19)	2.05 (1.56-2.73)	2.47 (1.82-3.37)	3.11 (2.20-4.43)	3.69 (2.52-5.45)
3-hr	0.407 (0.339-0.493)	0.607 (0.505-0.736)	0.903 (0.750-1.10)	1.17 (0.965-1.44)	1.58 (1.26-2.01)	1.94 (1.51-2.52)	2.34 (1.78-3.11)	2.80 (2.06-3.83)	3.49 (2.47-4.98)	4.10 (2.80-6.06)
6-hr	0.543 (0.452-0.657)	0.806 (0.671-0.977)	1.19 (0.988-1.45)	1.54 (1.26-1.88)	2.06 (1.64-2.61)	2.50 (1.95-3.25)	3.00 (2.28-3.99)	3.56 (2.63-4.86)	4.39 (3.11-6.27)	5.12 (3.49-7.56)
12-hr	0.650 (0.542-0.788)	0.982 (0.818-1.19)	1.46 (1.22-1.78)	1.89 (1.56-2.32)	2.54 (2.02-3.22)	3.09 (2.41-4.01)	3.70 (2.81-4.92)	4.38 (3.24-6.00)	5.41 (3.83-7.72)	6.28 (4.29-9.29)
24-hr	0.771 (0.682-0.889)	1.19 (1.05-1.37)	1.80 (1.58-2.08)	2.34 (2.04-2.73)	3.14 (2.66-3.79)	3.83 (3.18-4.71)	4.59 (3.72-5.77)	5.44 (4.29-7.03)	6.71 (5.09-9.03)	7.80 (5.72-10.8)
2-day	0.864 (0.765-0.996)	1.35 (1.19-1.56)	2.05 (1.81-2.37)	2.67 (2.34-3.12)	3.59 (3.04-4.33)	4.37 (3.63-5.37)	5.22 (4.23-6.57)	6.17 (4.87-7.98)	7.58 (5.75-10.2)	8.78 (6.44-12.2)
3-day	0.913 (0.808-1.05)	1.43 (1.27-1.65)	2.18 (1.93-2.53)	2.85 (2.49-3.32)	3.83 (3.24-4.61)	4.66 (3.87-5.72)	5.56 (4.51-7.00)	6.57 (5.19-8.49)	8.07 (6.12-10.9)	9.34 (6.85-13.0)
4-day	0.951 (0.842-1.10)	1.50 (1.32-1.73)	2.29 (2.02-2.65)	2.98 (2.61-3.48)	4.01 (3.40-4.83)	4.88 (4.05-5.99)	5.83 (4.72-7.33)	6.88 (5.43-8.89)	8.45 (6.40-11.4)	9.77 (7.17-13.6)
7-day	1.00 (0.889-1.16)	1.59 (1.41-1.84)	2.45 (2.16-2.83)	3.20 (2.80-3.73)	4.31 (3.65-5.19)	5.24 (4.35-6.44)	6.25 (5.07-7.87)	7.38 (5.82-9.54)	9.03 (6.85-12.2)	10.4 (7.65-14.5)
10-day	1.04 (0.921-1.20)	1.66 (1.47-1.92)	2.56 (2.26-2.97)	3.36 (2.94-3.91)	4.53 (3.84-5.46)	5.51 (4.58-6.78)	6.58 (5.34-8.28)	7.76 (6.13-10.0)	9.50 (7.21-12.8)	11.0 (8.04-15.2)
20-day	1.11 (0.981-1.28)	1.80 (1.59-2.08)	2.80 (2.47-3.25)	3.70 (3.23-4.31)	5.03 (4.26-6.05)	6.14 (5.10-7.54)	7.35 (5.96-9.25)	8.68 (6.85-11.2)	10.6 (8.06-14.3)	12.2 (8.98-17.0)
30-day	1.21 (1.07-1.39)	1.97 (1.74-2.28)	3.11 (2.74-3.59)	4.12 (3.60-4.80)	5.64 (4.77-6.79)	6.91 (5.73-8.49)	8.28 (6.72-10.4)	9.80 (7.73-12.7)	12.0 (9.10-16.1)	13.8 (10.1-19.2)
45-day	1.29 (1.14-1.48)	2.13 (1.89-2.46)	3.39 (2.99-3.93)	4.53 (3.96-5.29)	6.25 (5.30-7.53)	7.71 (6.40-9.47)	9.28 (7.52-11.7)	11.0 (8.68-14.2)	13.5 (10.2-18.2)	15.6 (11.4-21.6)
60-day	1.37 (1.21-1.58)	2.29 (2.03-2.64)	3.68 (3.24-4.26)	4.94 (4.32-5.76)	6.84 (5.80-8.24)	8.46 (7.03-10.4)	10.2 (8.30-12.9)	12.1 (9.59-15.7)	14.9 (11.3-20.1)	17.2 (12.6-24.0)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

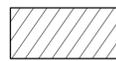
PF graphical

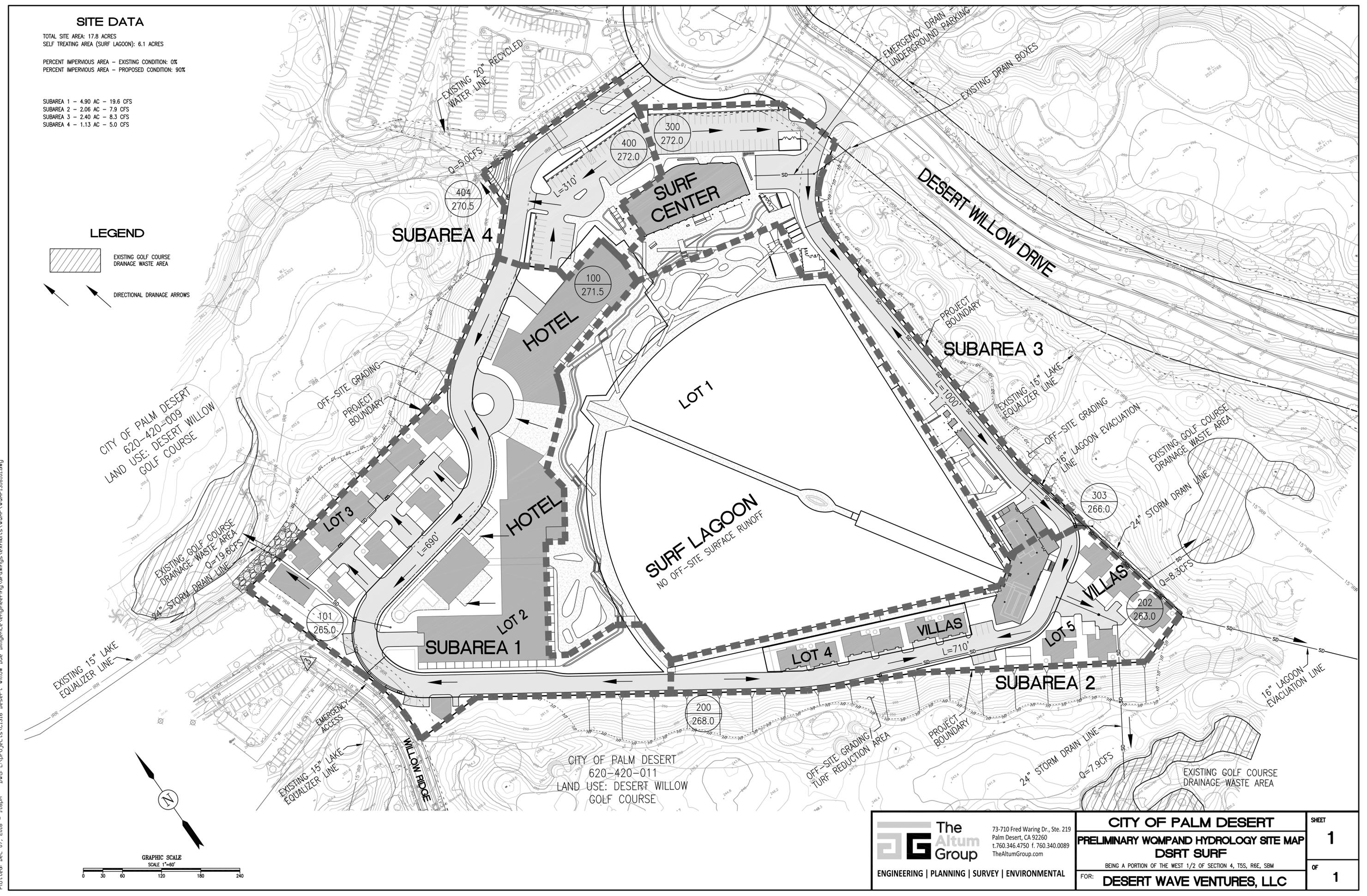
SITE DATA

TOTAL SITE AREA: 17.8 ACRES
 SELF-TREATING AREA (SURF LAGOON): 6.1 ACRES
 PERCENT IMPERVIOUS AREA - EXISTING CONDITION: 0%
 PERCENT IMPERVIOUS AREA - PROPOSED CONDITION: 90%

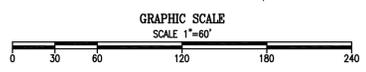
SUBAREA 1 - 4.90 AC - 19.6 CFS
 SUBAREA 2 - 2.06 AC - 7.9 CFS
 SUBAREA 3 - 2.40 AC - 8.3 CFS
 SUBAREA 4 - 1.13 AC - 5.0 CFS

LEGEND

-  EXISTING GOLF COURSE DRAINAGE WASTE AREA
-  DIRECTIONAL DRAINAGE ARROWS



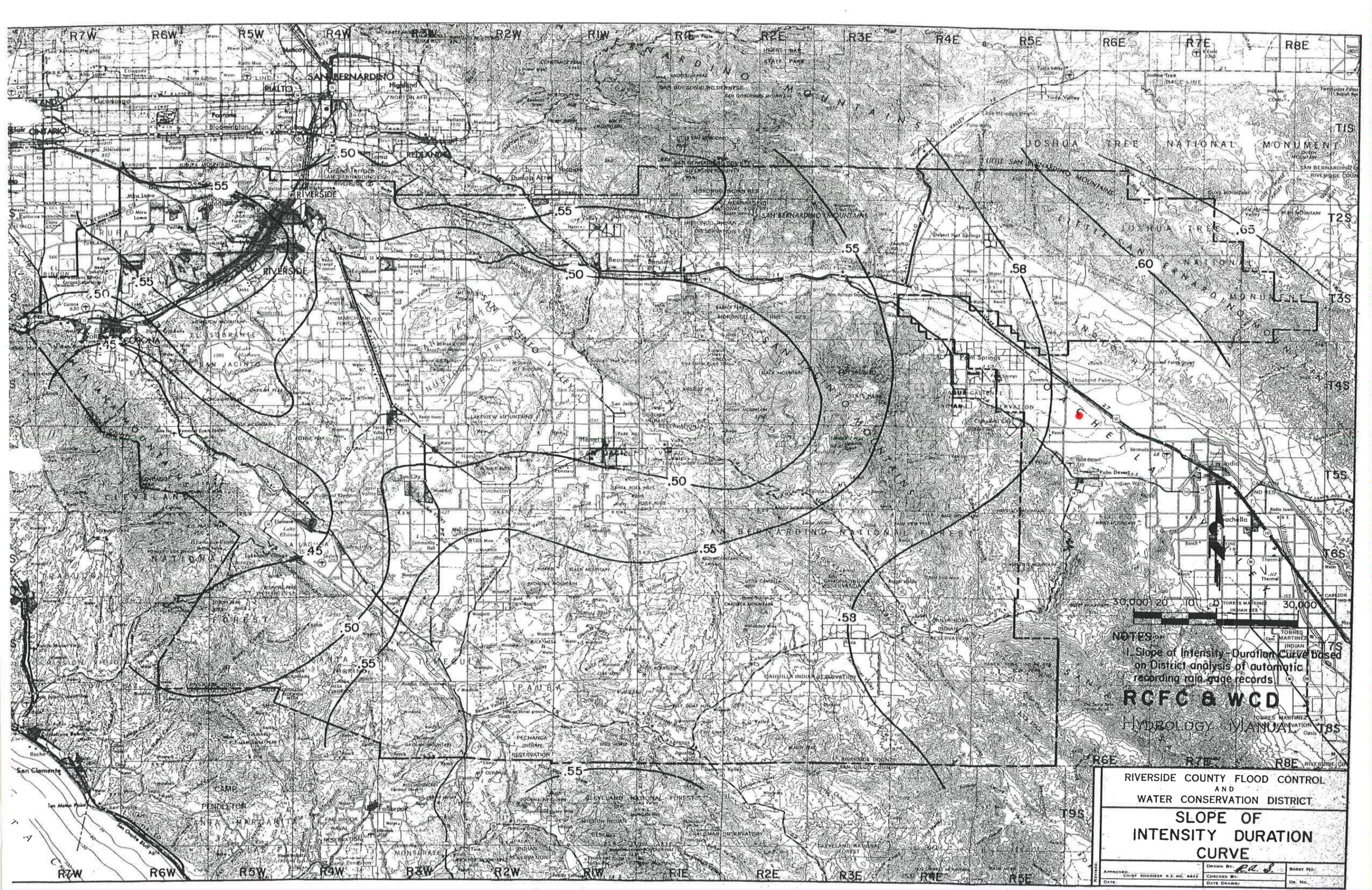
Plotted: Dec 07, 2018 - 118pm DWG: L:\projects\CI316 Desert Willow Due Intelligence\engineering\drawings\exhibits\WOMP\1316101.dwg



The Altum Group
 ENGINEERING | PLANNING | SURVEY | ENVIRONMENTAL

CITY OF PALM DESERT
PRELIMINARY WOMPAND HYDROLOGY SITE MAP
DSRT SURF
 BEING A PORTION OF THE WEST 1/2 OF SECTION 4, T5S, R6E, SBM
FOR: DESERT WAVE VENTURES, LLC

SHEET **1**
 OF **1**



NOTES
 1. Slope of Intensity-Duration Curve Based on District analysis of automatic recording rain gage records.

RCFC & WCD
 HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SLOPE OF INTENSITY DURATION CURVE

APPROVED: _____ DATE: _____	CHECKED BY: _____ DATE DRAWN: _____	DRAWN BY: <i>P.A.S.</i> DATE: _____	SHEET NO. _____ DR. NO. _____
--------------------------------	--	--	----------------------------------

Desert Willow South Golf Course

RUNOFF MANAGEMENT PLAN

February 12, 1997

Prepared By:



MAINIERO, SMITH AND ASSOCIATES, INC.

Planning / Civil Engineering / Land Surveying

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Telephone (619) 320-9811 FAX (619) 323-7893

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C. Runoff Volumes	3
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Appendix 2: Effective Rain - Golf Course Effective Rain - Hotel Area Effective Rain - Residential Area	
Appendix 3: Storm Drain - Size Analysis	
V. FIGURES	
Figure 1. DESERT WILLOW SOUTH GOLF COURSE MASTER DRAINAGE PLAN	

I. INTRODUCTION

A. Purpose and Scope

The City of Palm Desert and the Coachella Valley Water District have adopted policies of regulating the runoff from new land developments in watersheds which do not have adequate downstream flood control facilities. The City has adopted a runoff management policy which provides for containing all runoff within the Project during the 100-year flood. Under this plan, there will be no significant runoff from the site onto adjacent properties under 100-year flood conditions.

This report presents the results of onsite hydrology and drainage studies conducted to identify drainage collection locations and volumes of water to be managed. The following activities and information were involved in the preparation of this report.

- The interior drainage subareas were delineated on a 100-scale development plan which shows streets, lots, golf course layout and grading. This map is enclosed herewith as Figure 1: DESERT WILLOW SOUTH GOLF COURSE MASTER DRAINAGE PLAN.
- 100-year rainfall amounts for the 3-hour, 6-hour, and 24-hour storms were obtained from the Riverside County Flood Control and Water Conservation District (RCFCWCD) Hydrology Manual.
- Rainfall distribution patterns were obtained from the RCFCWCD Hydrology Manual.
- Net rain was computed from each subarea to determine runoff volume and storage requirements.
- Peak runoff rates were computed for the hotel and residential pads using the RCFCWCD Rational Method. These rates were used for sizing storm drains to convey the drainage to the golf course.
- Provisions were incorporated into the grading plan to collect, convey, and store onsite.

B. Conclusions

- The retention areas provided within the golf course fairways provide adequate capacity for the 100-year runoff from all drainage areas. In addition to the designated retention areas, there are depressions in the grading of the other fairways which provide a generous level of additional storage over and above the calculated amounts.
- The Pipe sizes shown on the Master Drainage Plan are adequate to carry the computed 100-year flood.

C. Recommendation

Implement the runoff management plan depicted on Figure 1 in the Appendices.

II. ORGANIZATION

A. Figures

Figure 1 presents the runoff management plan. Sources, drainage paths, and destinations of runoff are shown on this drawing. The various drainage subareas are created by the grading of the golf course. Runoff is collected in the low areas of the golf course.

B. Appendices

The hydrology and hydraulic calculations are contained in the Appendices. Appendix 1 contains Rational Method Calculations for the peak Qs from the hotel and residential subareas. Appendix 2 contains net rain calculations for each land use, for use in computing the necessary runoff storage volume. Appendix 3 contains the storm drain size analysis for the 100 years Qs.

III. ELEMENTS OF RUNOFF MANAGEMENT PLAN

A. Drainage Concept

Runoff from the hotel, residential area and golf course will be routed to retention areas in the golf course for storage as shown on Figure 1. Disposal of accumulated water will take place by infiltration, assisted by the installation of drywells.

B. Computation of Peak Flow Rates

Appendix 1 contains the Rational Method computations to determine peak runoff from each of the hotel and residential areas and the location of discharge to the golf course. The resulting discharge points and discharges are shown on Figure 1.

C. Runoff Volumes

Figure 1 contains the calculations of runoff volumes from the hotel, residential and golf course areas. Provisions for storage of these amounts has been provided within the retention areas, as shown on Figure 1. Appendix 1 contains calculations of effective rain for the hotel, residential and golf course areas.

APPENDIX 1:

**RATIONAL METHOD CALCULATIONS
FOR
HOTEL AND RESIDENTIAL AREAS**

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL
(c) Copyright 1982-94 Advanced Engineering Software (aes)
Ver. 1.5A Release Date: 6/01/94 License ID 1304

Analysis prepared by:

MAINIERO, SMITH & ASSOCIATES, INC.

CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* Subareas A1, A2 and A3

*
*
*
*

FILE NAME: 1102A.DAT
TIME/DATE OF STUDY: 15:21 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024
COMPUTED RAINFALL INTENSITY DATA:
STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898
SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
 AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 101.00 TO NODE 102.00 IS CODE = 21

 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 =====
 =====

ASSUMED INITIAL SUBAREA UNIFORM
 DEVELOPMENT IS CONDOMINIUM
 $TC = K * [(LENGTH^{**3}) / (ELEVATION CHANGE)]^{**.2}$
 INITIAL SUBAREA FLOW-LENGTH = 900.00
 UPSTREAM ELEVATION = 264.00
 DOWNSTREAM ELEVATION = 260.00
 ELEVATION DIFFERENCE = 4.00
 $TC = .359 * [(900.00^{**3}) / (4.00)]^{**.2} = 16.124$
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.121
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7198
 SUBAREA RUNOFF(CFS) = 6.64
 TOTAL AREA(ACRES) = 4.35 TOTAL RUNOFF(CFS) = 6.64

FLOW PROCESS FROM NODE 102.00 TO NODE 103.00 IS CODE = 6

 >>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
 =====
 =====

UPSTREAM ELEVATION = 260.00 DOWNSTREAM ELEVATION = 243.00
 STREET LENGTH(FEET) = 750.00 CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 12.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 6.00
 INTERIOR STREET CROSSFALL(DECIMAL) = .020
 OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 8.58
 STREETFLOW MODEL RESULTS:
 STREET FLOWDEPTH(FEET) = .33
 HALFSTREET FLOODWIDTH(FEET) = 10.36

AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.60
PRODUCT OF DEPTH&VELOCITY = 1.20
STREETFLOW TRAVELTIME(MIN) = 3.47 TC(MIN) = 19.60

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.894
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7112
SUBAREA AREA(ACRES) = 2.90 SUBAREA RUNOFF(CFS) = 3.91
SUMMED AREA(ACRES) = 7.25 TOTAL RUNOFF(CFS) = 10.55
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .36 HALFSTREET FLOODWIDTH(FEET) = 11.67
FLOW VELOCITY(FEET/SEC.) = 3.56 DEPTH*VELOCITY = 1.28

FLOW PROCESS FROM NODE 103.00 TO NODE 203.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<

=====
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 19.60
RAINFALL INTENSITY(INCH/HR) = 1.89
TOTAL STREAM AREA(ACRES) = 7.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 10.55

FLOW PROCESS FROM NODE 201.00 TO NODE 202.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====
ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 600.00
UPSTREAM ELEVATION = 247.00
DOWNSTREAM ELEVATION = 243.00
ELEVATION DIFFERENCE = 4.00
TC = .359*[(600.00**3)/(4.00)]**.2 = 12.642
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.442
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7308
SUBAREA RUNOFF(CFS) = 5.10
TOTAL AREA(ACRES) = 2.86 TOTAL RUNOFF(CFS) = 5.10

FLOW PROCESS FROM NODE 202.00 TO NODE 203.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=====

=====

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 12.64
RAINFALL INTENSITY(INCH/HR) = 2.44
TOTAL STREAM AREA(ACRES) = 2.86
PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.10

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	10.55	19.60	1.894	7.25
2	5.10	12.64	2.442	2.86

*****WARNING*****

IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	11.91	12.64	2.442
2	14.51	19.60	1.894

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14.51 Tc(MIN.) = 19.60
TOTAL AREA(ACRES) = 10.11

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END OF STUDY SUMMARY:

PEAK FLOW RATE(CFS) = 14.51 Tc(MIN.) = 19.60
TOTAL AREA(ACRES) = 10.11

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL
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Analysis prepared by:

MAINIERO, SMITH & ASSOCIATES, INC.

CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA B-1

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* 100 YR. STORM EVENT

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FILE NAME: 1102B.DAT

TIME/DATE OF STUDY: 15:24 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 301.00 TO NODE 302.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

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ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = $K * [(LENGTH^{**3}) / (ELEVATION CHANGE)]^{**.2}$
INITIAL SUBAREA FLOW-LENGTH = 300.00
UPSTREAM ELEVATION = 248.00
DOWNSTREAM ELEVATION = 246.00
ELEVATION DIFFERENCE = 2.00
TC = $.359 * [(300.00^{**3}) / (2.00)]^{**.2} = 9.581$
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.868
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7435
SUBAREA RUNOFF(CFS) = 2.58
TOTAL AREA(ACRES) = 1.21 TOTAL RUNOFF(CFS) = 2.58

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END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 2.58 Tc(MIN.) = 9.58
TOTAL AREA(ACRES) = 1.21

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
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Analysis prepared by:

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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREAS C-1 AND C-2

*

* 100 YR. STORM EVENT

*

*

*

FILE NAME: 1102C.DAT

TIME/DATE OF STUDY: 15:25 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
 NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANU
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 AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYS
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FLOW PROCESS FROM NODE 401.00 TO NODE 402.00 IS CODE = 21

 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
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ASSUMED INITIAL SUBAREA UNIFORM
 DEVELOPMENT IS CONDOMINIUM
 $TC = K * [(LENGTH**3) / (ELEVATION CHANGE)]**.2$
 INITIAL SUBAREA FLOW-LENGTH = 1000.00
 UPSTREAM ELEVATION = 260.00
 DOWNSTREAM ELEVATION = 249.00
 ELEVATION DIFFERENCE = 11.00
 $TC = .359 * [(1000.00**3) / (11.00)]**.2 = 14.030$
 10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.299
 SOIL CLASSIFICATION IS "A"
 CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7261
 SUBAREA RUNOFF(CFS) = 9.26
 TOTAL AREA(ACRES) = 5.55 TOTAL RUNOFF(CFS) = 9.26

FLOW PROCESS FROM NODE 402.00 TO NODE 403.00 IS CODE = 6

 >>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<
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 =====

UPSTREAM ELEVATION = 249.00 DOWNSTREAM ELEVATION = 247.75
 STREET LENGTH(FEET) = 250.00 CURB HEIGHT(INCHES) = 6.
 STREET HALFWIDTH(FEET) = 12.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 6.00
 INTERIOR STREET CROSSFALL(DECIMAL) = .020
 OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 11.01
 STREET FLOWING FULL
 STREETFLOW MODEL RESULTS:
 STREET FLOWDEPTH(FEET) = .43

HALFSTREET FLOODWIDTH(FEET) = 12.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.31
PRODUCT OF DEPTH&VELOCITY = 1.01
STREETFLOW TRAVELTIME(MIN) = 1.80 TC(MIN) = 15.83

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.143
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7207
SUBAREA AREA(ACRES) = 2.26 SUBAREA RUNOFF(CFS) = 3.49
SUMMED AREA(ACRES) = 7.81 TOTAL RUNOFF(CFS) = 12.76
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .45 HALFSTREET FLOODWIDTH(FEET) = 12.00
FLOW VELOCITY(FEET/SEC.) = 2.44 DEPTH*VELOCITY = 1.11

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END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 12.76 Tc(MIN.) = 15.83
TOTAL AREA(ACRES) = 7.81
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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
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Analysis prepared by:

MAINIERO, SMITH & ASSOCIATES, INC.

CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

- * SUBAREA D-1
- *
- * 100 YEAR STORM EVENT
- *
- *
 *

FILE NAME: 1102D.DAT
TIME/DATE OF STUDY: 15:27 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024
COMPUTED RAINFALL INTENSITY DATA:
STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898
SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANU
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AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYS
ES

FLOW PROCESS FROM NODE 501.00 TO NODE 502.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
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ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM

TC = $K * [(LENGTH ** 3) / (ELEVATION CHANGE)] ** .2$

INITIAL SUBAREA FLOW-LENGTH = 500.00

UPSTREAM ELEVATION = 250.00

DOWNSTREAM ELEVATION = 246.00

ELEVATION DIFFERENCE = 4.00

TC = $.359 * [(500.00 ** 3) / (4.00)] ** .2 = 11.332$

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.602

SOIL CLASSIFICATION IS "A"

CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7358

SUBAREA RUNOFF(CFS) = 4.21

TOTAL AREA(ACRES) = 2.20 TOTAL RUNOFF(CFS) = 4.21

=====

END OF STUDY SUMMARY:

PEAK FLOW RATE(CFS) = 4.21 Tc(MIN.) = 11.33

TOTAL AREA(ACRES) = 2.20

=====

END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREAS E-1 AND E-2

*

* 100 YEAR STORM EVENT

*

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*

FILE NAME: 1102E.DAT

TIME/DATE OF STUDY: 15:28 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANU
AL
AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYS
ES

FLOW PROCESS FROM NODE 601.00 TO NODE 602.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

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ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 600.00
UPSTREAM ELEVATION = 260.00
DOWNSTREAM ELEVATION = 257.00
ELEVATION DIFFERENCE = 3.00
TC = .359*[(600.00**3)/(3.00)]**.2 = 13.391
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.362
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7282
SUBAREA RUNOFF(CFS) = 2.46
TOTAL AREA(ACRES) = 1.43 TOTAL RUNOFF(CFS) = 2.46

FLOW PROCESS FROM NODE 602.00 TO NODE 603.00 IS CODE = 6

>>>>COMPUTE STREETFLOW TRAVELTIME THRU SUBAREA<<<<<

=====

UPSTREAM ELEVATION = 257.00 DOWNSTREAM ELEVATION = 254.50
STREET LENGTH(FEET) = 500.00 CURB HEIGHT(INCHES) = 6.
STREET HALFWIDTH(FEET) = 12.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK = 6.00
INTERIOR STREET CROSSFALL(DECIMAL) = .020
OUTSIDE STREET CROSSFALL(DECIMAL) = .020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

**TRAVELTIME COMPUTED USING MEAN FLOW(CFS) = 5.09
STREETFLOW MODEL RESULTS:
STREET FLOWDEPTH(FEET) = .36
HALFSTREET FLOODWIDTH(FEET) = 11.67

AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.72
PRODUCT OF DEPTH&VELOCITY = .62
STREETFLOW TRAVELTIME(MIN) = 4.85 TC(MIN) = 18.24

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 1.975
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7144
SUBAREA AREA(ACRES) = 3.74 SUBAREA RUNOFF(CFS) = 5.28
SUMMED AREA(ACRES) = 5.17 TOTAL RUNOFF(CFS) = 7.73
END OF SUBAREA STREETFLOW HYDRAULICS:
DEPTH(FEET) = .40 HALFSTREET FLOODWIDTH(FEET) = 12.00
FLOW VELOCITY(FEET/SEC.) = 2.03 DEPTH*VELOCITY = .80

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END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 7.73 Tc(MIN.) = 18.24
TOTAL AREA(ACRES) = 5.17
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END OF RATIONAL METHOD ANALYSIS

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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA F-1

*

* 100 YEAR STORM EVENT

*

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FILE NAME: 1102F.DAT
TIME/DATE OF STUDY: 15:29 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024
COMPUTED RAINFALL INTENSITY DATA:
STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898
SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"--VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 701.00 TO NODE 702.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

ASSUMED INITIAL SUBAREA UNIFORM DEVELOPMENT IS COMMERCIAL

TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2

INITIAL SUBAREA FLOW-LENGTH = 1000.00

UPSTREAM ELEVATION = 270.00

DOWNSTREAM ELEVATION = 260.00

ELEVATION DIFFERENCE = 10.00

TC = .303*[(1000.00**3)/(10.00)]**.2 = 12.067

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.509

SOIL CLASSIFICATION IS "A"

COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8523

SUBAREA RUNOFF(CFS) = 12.44

TOTAL AREA(ACRES) = 5.82 TOTAL RUNOFF(CFS) = 12.44

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END OF STUDY SUMMARY:

PEAK FLOW RATE(CFS) = 12.44 Tc(MIN.) = 12.07

TOTAL AREA(ACRES) = 5.82

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END OF RATIONAL METHOD ANALYSIS

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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA G-1

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* 100 YEAR STORM EVENT

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FILE NAME: 1102G.DAT

TIME/DATE OF STUDY: 15:31 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95
10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770
10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980
100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520
100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600
SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047
SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024
COMPUTED RAINFALL INTENSITY DATA:
STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898
SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANU

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AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYS

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FLOW PROCESS FROM NODE 801.00 TO NODE 802.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS COMMERCIAL

TC = K * [(LENGTH**3)/(ELEVATION CHANGE)]**.2

INITIAL SUBAREA FLOW-LENGTH = 900.00

UPSTREAM ELEVATION = 271.00

DOWNSTREAM ELEVATION = 260.00

ELEVATION DIFFERENCE = 11.00

TC = .303 * [(900.00**3)/(11.00)]**.2 = 11.114

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.632

SOIL CLASSIFICATION IS "A"

COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8533

SUBAREA RUNOFF(CFS) = 13.50

TOTAL AREA(ACRES) = 6.01 TOTAL RUNOFF(CFS) = 13.50

END OF STUDY SUMMARY:

PEAK FLOW RATE(CFS) = 13.50 Tc(MIN.) = 11.11

TOTAL AREA(ACRES) = 6.01

END OF RATIONAL METHOD ANALYSIS

□

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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA H-1 SOUTH PORTION OF HOTEL SITE

*

* 100 YEAR STORM EVENT

*

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*

FILE NAME: 1102H.DAT

TIME/DATE OF STUDY: 15:32 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 901.00 TO NODE 902.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

ASSUMED INITIAL SUBAREA UNIFORM DEVELOPMENT IS COMMERCIAL

TC = K * [(LENGTH**3) / (ELEVATION CHANGE)]**.2

INITIAL SUBAREA FLOW-LENGTH = 900.00

UPSTREAM ELEVATION = 265.00

DOWNSTREAM ELEVATION = 259.00

ELEVATION DIFFERENCE = 6.00

TC = .303 * [(900.00**3) / (6.00)]**.2 = 12.546

10 YEAR RAINFALL INTENSITY (INCH/HOUR) = 2.453

SOIL CLASSIFICATION IS "A"

COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8518

SUBAREA RUNOFF (CFS) = 11.68

TOTAL AREA (ACRES) = 5.59 TOTAL RUNOFF (CFS) = 11.68

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END OF STUDY SUMMARY:

PEAK FLOW RATE (CFS) = 11.68 Tc (MIN.) = 12.55

TOTAL AREA (ACRES) = 5.59

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END OF RATIONAL METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
(RCFC&WCD) 1978 HYDROLOGY MANUAL
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Analysis prepared by:

MAINIERO, SMITH & ASSOCIATES, INC.

CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA I-1 RESIDENTIAL AREAS

*

* 100 YEAR STORM EVENT

*

*

*

FILE NAME: 1102I.DAT

TIME/DATE OF STUDY: 15:34 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<

ASSUMED INITIAL SUBAREA UNIFORM DEVELOPMENT IS CONDOMINIUM

TC = $K * [(LENGTH**3) / (ELEVATION CHANGE)]**.2$

INITIAL SUBAREA FLOW-LENGTH = 800.00

UPSTREAM ELEVATION = 273.00

DOWNSTREAM ELEVATION = 261.00

ELEVATION DIFFERENCE = 12.00

TC = $.359 * [(800.00**3) / (12.00)]**.2 = 12.060$

10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.510

SOIL CLASSIFICATION IS "A"

CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7330

SUBAREA RUNOFF(CFS) = 5.26

TOTAL AREA(ACRES) = 2.86 TOTAL RUNOFF(CFS) = 5.26

END OF STUDY SUMMARY:

PEAK FLOW RATE(CFS) = 5.26 Tc(MIN.) = 12.06

TOTAL AREA(ACRES) = 2.86

END OF RATIONAL METHOD ANALYSIS

□

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Analysis prepared by:

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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA J-1 RESIDENTIAL AREA

*

* 100 YEAR STORM EVENT

*

*

*

FILE NAME: 1102J.DAT

TIME/DATE OF STUDY: 15:35 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 1101.00 TO NODE 1102.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH = 850.00
UPSTREAM ELEVATION = 273.00
DOWNSTREAM ELEVATION = 259.00
ELEVATION DIFFERENCE = 14.00
TC = .359*[(850.00**3)/(14.00)]**.2 = 12.127
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.502
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7327
SUBAREA RUNOFF(CFS) = 6.45
TOTAL AREA(ACRES) = 3.52 TOTAL RUNOFF(CFS) = 6.45

=====

END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 6.45 Tc(MIN.) = 12.13
TOTAL AREA(ACRES) = 3.52

=====

END OF RATIONAL METHOD ANALYSIS

□

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777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA K-1 RESIDENTIAL AREA

*

* 100 YEAR STORM EVENT

*

*

*

FILE NAME: 1102K.DAT

TIME/DATE OF STUDY: 15:36 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED
NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANU
AL
AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYS
ES

FLOW PROCESS FROM NODE 1201.00 TO NODE 1202.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=====

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = $K * [(LENGTH**3) / (ELEVATION CHANGE)]**.2$
INITIAL SUBAREA FLOW-LENGTH = 450.00
UPSTREAM ELEVATION = 273.00
DOWNSTREAM ELEVATION = 266.00
ELEVATION DIFFERENCE = 7.00
TC = $.359 * [(450.00**3) / (7.00)]**.2 = 9.511$
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.880
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7438
SUBAREA RUNOFF(CFS) = 4.95
TOTAL AREA(ACRES) = 2.31 TOTAL RUNOFF(CFS) = 4.95
=====

=====

END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 4.95 Tc(MIN.) = 9.51
TOTAL AREA(ACRES) = 2.31
=====

=====

END OF RATIONAL METHOD ANALYSIS

□

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CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING AND LAND PLANNING

777 TAHQUIST CANYON WAY, SUITE 301

PALM SPRINGS, CALIFORNIA 92262-7066

***** DESCRIPTION OF STUDY *****

* SUBAREA L-1 RESIDENTIAL AREA

*

* 100 YEAR STORM EVENT

*

*

*

FILE NAME: 1102L.DAT

TIME/DATE OF STUDY: 15:37 2/12/1997

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE =
.95

10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 2.770

10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = .980

100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) = 4.520

100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) = 1.600

SLOPE OF 10-YEAR INTENSITY-DURATION CURVE = .5799047

SLOPE OF 100-YEAR INTENSITY-DURATION CURVE = .5796024

COMPUTED RAINFALL INTENSITY DATA:

STORM EVENT = 10.00 1-HOUR INTENSITY(INCH/HOUR) = .9898

SLOPE OF INTENSITY DURATION CURVE = .5799

RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED

NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES

FLOW PROCESS FROM NODE 1301.00 TO NODE 1302.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

=====

ASSUMED INITIAL SUBAREA UNIFORM
DEVELOPMENT IS CONDOMINIUM
TC = $K * [(LENGTH^{**3}) / (ELEVATION CHANGE)]^{**0.2}$
INITIAL SUBAREA FLOW-LENGTH = 1000.00
UPSTREAM ELEVATION = 266.00
DOWNSTREAM ELEVATION = 256.00
ELEVATION DIFFERENCE = 10.00
TC = $.359 * [(1000.00^{**3}) / (10.00)]^{**0.2} = 14.300$
10 YEAR RAINFALL INTENSITY(INCH/HOUR) = 2.274
SOIL CLASSIFICATION IS "A"
CONDOMINIUM DEVELOPMENT RUNOFF COEFFICIENT = .7252
SUBAREA RUNOFF(CFS) = 13.79
TOTAL AREA(ACRES) = 8.36 TOTAL RUNOFF(CFS) = 13.79

=====

=====

END OF STUDY SUMMARY:
PEAK FLOW RATE(CFS) = 13.79 Tc(MIN.) = 14.30
TOTAL AREA(ACRES) = 8.36

=====

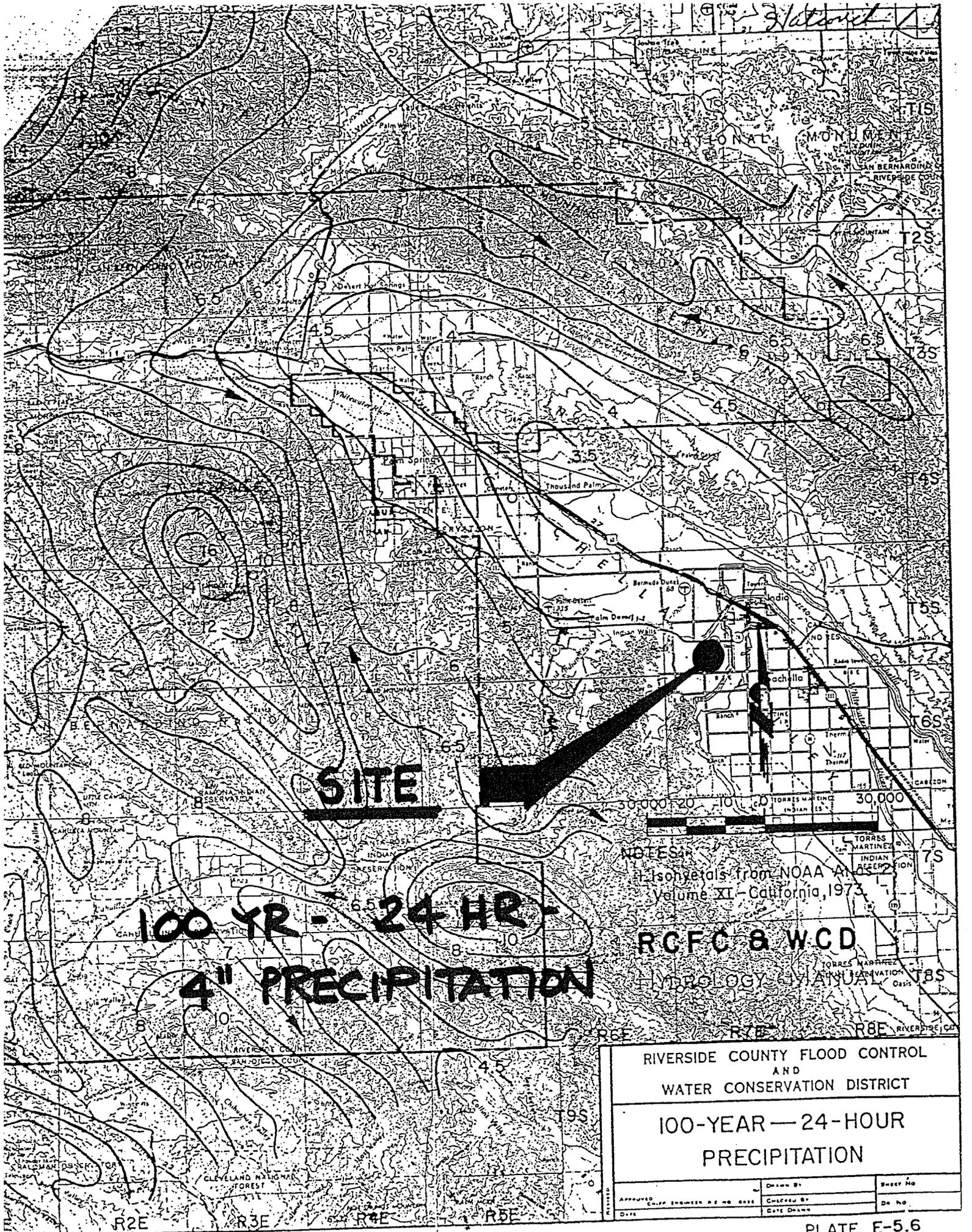
=====

END OF RATIONAL METHOD ANALYSIS

□

APPENDIX 2:

**EFFECTIVE RAIN
FOR
GOLF COURSE, HOTEL AREA AND
RESIDENTIAL AREA**



SITE

**100 YR - 24 HR -
4" PRECIPITATION**

NOTES:
Isohyets from NOAA Atlas
Volume XI - California, 1973

RCFC & WCD

HYDROLOGY MANUAL

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
100-YEAR — 24-HOUR PRECIPITATION		
APPROVED	DATE	BY
CHIEF ENGINEER	DATE	DATE
DESIGNED BY	CHECKED BY	SHEET NO.
DATE	DATE	NO.

RAINFALL PATTERNS IN PERCENT

3-HOUR STORM				6-HOUR STORM				24-HOUR STORM						
TIME PERIOD	5-MIN PERIOD	10-MIN PERIOD	15-MIN PERIOD	30-MIN PERIOD	5-MIN PERIOD	10-MIN PERIOD	15-MIN PERIOD	30-MIN PERIOD	5-MIN PERIOD	15-MIN PERIOD	30-MIN PERIOD	60-MIN PERIOD	15-MIN PERIOD	TIME PERIOD
1	1.3	2.6	3.7	8.5	.5	1.1	1.7	3.6	4.9	1.7	.2	.5	1.2	4.9
2	1.3	2.6	4.8	10.0	.6	1.2	1.9	4.3	5.0	1.8	.3	.7	1.3	5.0
3	1.1	3.3	5.1	13.9	.6	1.3	2.1	4.8	5.1	1.9	.4	.6	1.3	5.1
4	1.5	3.3	4.9	17.4	.6	1.4	2.2	4.9	5.2	2.0	.4	.7	2.1	5.2
5	1.5	3.3	6.6	29.9	.6	1.4	2.4	5.3	5.3	2.1	.3	.8	2.8	5.3
6	1.8	3.4	7.3	20.3	.7	1.5	2.4	5.8	5.4	2.1	.3	1.0	3.4	5.4
7	1.5	4.4	8.4		.7	1.6	2.4	6.8	5.5	2.1	.3	1.0	3.8	5.5
8	1.8	4.2	9.0		.7	1.6	2.5	9.0	5.6	2.3	.4	1.1	4.6	5.6
9	1.8	5.3	12.3		.7	1.6	2.6	11.6	5.7	2.4	.4	1.1	6.3	5.7
10	1.5	5.1	17.6		.7	1.6	2.7	14.4	5.8	2.4	.4	1.1	7.0	5.8
11	1.6	5.9	16.1		.8	1.7	3.0	4.4	5.8	2.4	.4	1.1	7.3	5.8
12	1.8	5.9	4.2		.8	1.7	3.0		5.9	2.5	.5	1.3	8.2	5.9
13	2.2	7.3			.8	1.7	3.2		6.1	2.6	.5	1.6	10.8	6.1
14	2.2	8.5			.8	1.8	3.6		6.2	3.1	.5	1.8	11.4	6.2
15	2.2	14.1			.8	1.8	4.3		6.3	3.6	.5	2.1	10.4	6.3
16	2.0	14.1			.8	1.8	4.7		6.4	4.2	.6	2.5	18.5	6.4
17	2.6	3.8			.8	2.0	5.4		6.5	4.7	.6	3.0	1.4	6.5
18	2.7	2.4			.8	2.0	6.2		6.6	5.6	.7	3.3	1.9	6.6
19	2.7				.8	2.1	6.9		6.6	1.9	.7	4.3	1.2	6.6
20	2.7				.8	2.1	7.5		6.7	1.9	.7	4.3	1.2	6.7
21	3.3				.8	2.5	10.6		6.8	.6	.7	4.0	1.1	6.8
22	3.1				.8	2.8	14.5		6.9	.6	.7	4.0	1.1	6.9
23	2.9				.8	3.0	3.4		7.0	.5	.8	3.8	.9	7.0
24	3.0				.9	3.2	1.0		7.1	.5	.8	3.5	.9	7.1
25	3.1				.8	3.5			7.2	.5	.8	3.5	.8	7.2
26	4.2				.9	3.9			7.2	.5	.8	3.5	.8	7.2
27	5.0				.9	4.2			7.2	.5	.8	3.5	.8	7.2
28	6.8				.9	4.5			7.2	.5	.8	3.5	.8	7.2
29	7.3				.9	5.1			7.2	.5	.8	3.5	.8	7.2
30	8.2				.9	6.7			7.2	.5	.8	3.5	.8	7.2
31	5.9				1.0	8.1			7.2	.5	.8	3.5	.8	7.2
32	5.9				1.0	10.3			7.2	.5	.8	3.5	.8	7.2
33	1.8				1.0	2.8			7.2	.5	.8	3.5	.8	7.2
34	1.8				1.0	1.1			7.2	.5	.8	3.5	.8	7.2
35	.6				1.0	.5			7.2	.5	.8	3.5	.8	7.2
36					1.0				7.2	.5	.8	3.5	.8	7.2
37					1.0				7.2	.5	.8	3.5	.8	7.2
38					1.1				7.2	.5	.8	3.5	.8	7.2
39					1.1				7.2	.5	.8	3.5	.8	7.2
40					1.1				7.2	.5	.8	3.5	.8	7.2
41					1.2				7.2	.5	.8	3.5	.8	7.2
42					1.3				7.2	.5	.8	3.5	.8	7.2
43					1.4				7.2	.5	.8	3.5	.8	7.2
44					1.4				7.2	.5	.8	3.5	.8	7.2
45					1.5				7.2	.5	.8	3.5	.8	7.2
46					1.5				7.2	.5	.8	3.5	.8	7.2
47					1.6				7.2	.5	.8	3.5	.8	7.2
48					1.6				7.2	.5	.8	3.5	.8	7.2

NOTES:

1. 3 and 6-hour patterns based on the Indio area thunderstorm of September 24, 1939.
2. 24-hour patterns based on the general storm of March 2 & 3, 1938.

producing storm of March 1938. Tabulations of these patterns are given on Plate E-5.9 for selected unit time periods. These patterns are considered to represent a reasonable distribution of rainfall which will cause critical runoff conditions during major storm events.

Loss Rates - Factors influencing loss rates are discussed in detail in Section C of this report. Where sufficient data is available loss rates for unit hydrograph hydrology can be estimated from a study of rainfall-runoff relationships of major storms. Where such data is not available loss rates for pervious areas can be estimated using Plates E-6.1 and E-6.2. Loss rates for pervious areas estimated in this manner are generally consistent with previous District studies, and with loss rates developed by the Los Angeles District USCE in numerous hydrology studies in the Southern California area.

Loss rates for pervious areas can be adjusted to account for developed area using the relationship:

$$F = F_p (1.00 - 0.9A_i)$$

where:

F = Adjusted loss rate - inches/hour

F_p = Loss rate for pervious areas - inches/hour (Plate E-6.2)

A_i = Impervious area (actual) - decimal percent (Plate E-6.3)

Adjusted loss rates for the Synthetic Unit Hydrograph method on typical watersheds in the District run generally from 0.10 to 0.40 inches per hour, with most falling between 0.20 and 0.25 inches per hour. For short storms with durations of 6-hours or less the adjusted loss rate may be taken as constant. For longer duration storms the loss rate should normally be varied to decrease with time to yield a mean equal to the adjusted loss rate. For the 24-hour storm the loss curve can be expressed as a function of time:

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 10	0
Single Family Residential: (3)		
40,000 S. F. (1 Acre) Lots	10 - 25	20
20,000 S. F. (½ Acre) Lots	30 - 45	40
7,200 - 10,000 S. F. Lots	45 - 55	50
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial <i>Hotel</i>	80 -100	90

Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.
2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area should always be made, and a review of aerial photos, where available may assist in estimating the percentage of impervious cover in developed areas.
3. For typical horse ranch subdivisions increase impervious area 5 percent over the values recommended in the table above.

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IMPERVIOUS COVER
FOR
DEVELOPED AREAS

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

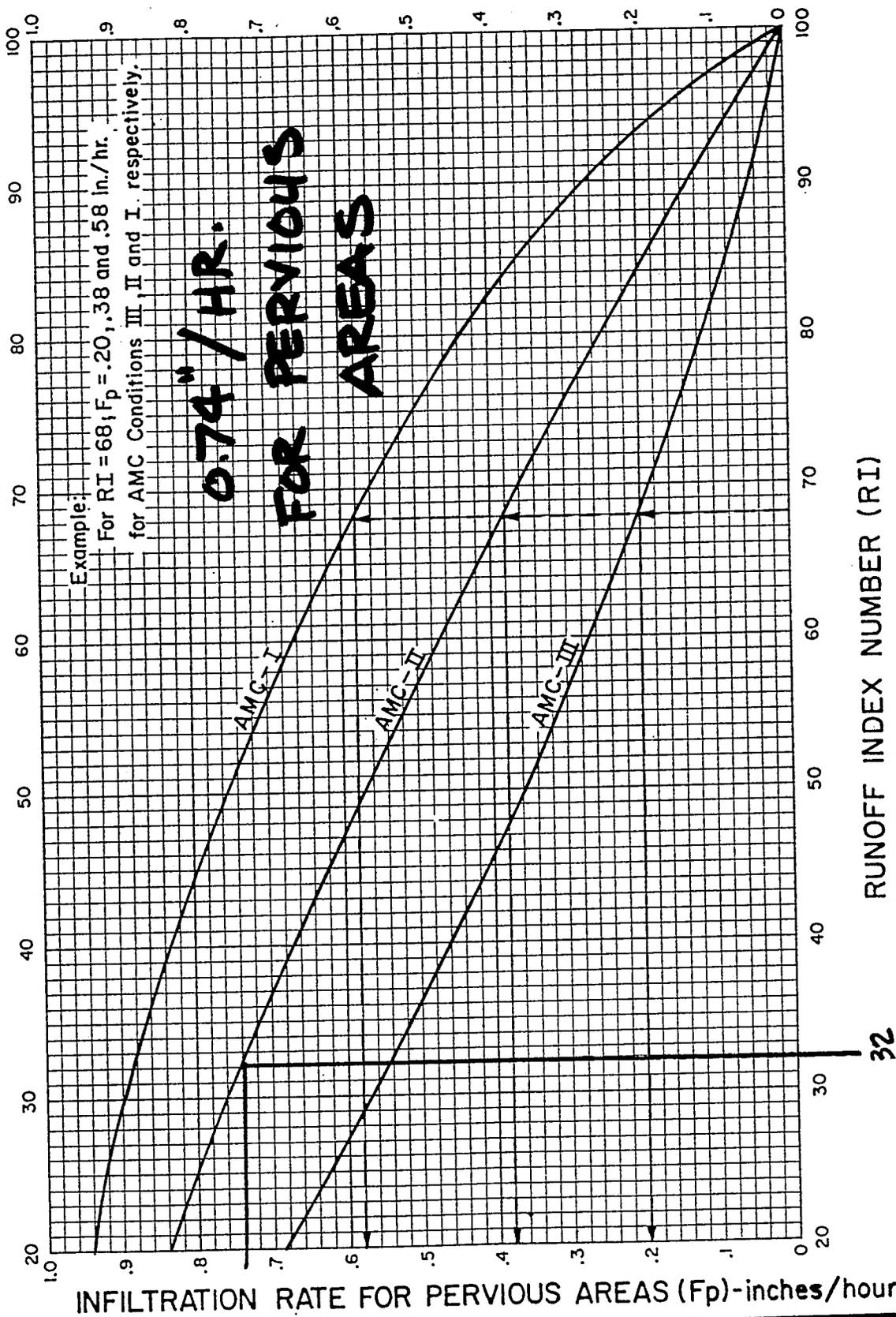
Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
<u>NATURAL COVERS -</u>					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
<u>URBAN COVERS -</u>					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
<u>AGRICULTURAL COVERS -</u>					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RI = 32

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS
FOR
PERVIOUS AREAS

NOTES:
 1. R.I. Number-Infiltration relationships are derived from rainfall-runoff relationships in Bibliography item No. 36.



**0.74" / HR.
 FOR PERVIOUS
 AREAS**

RCFC & WCD
 HYDROLOGY MANUAL

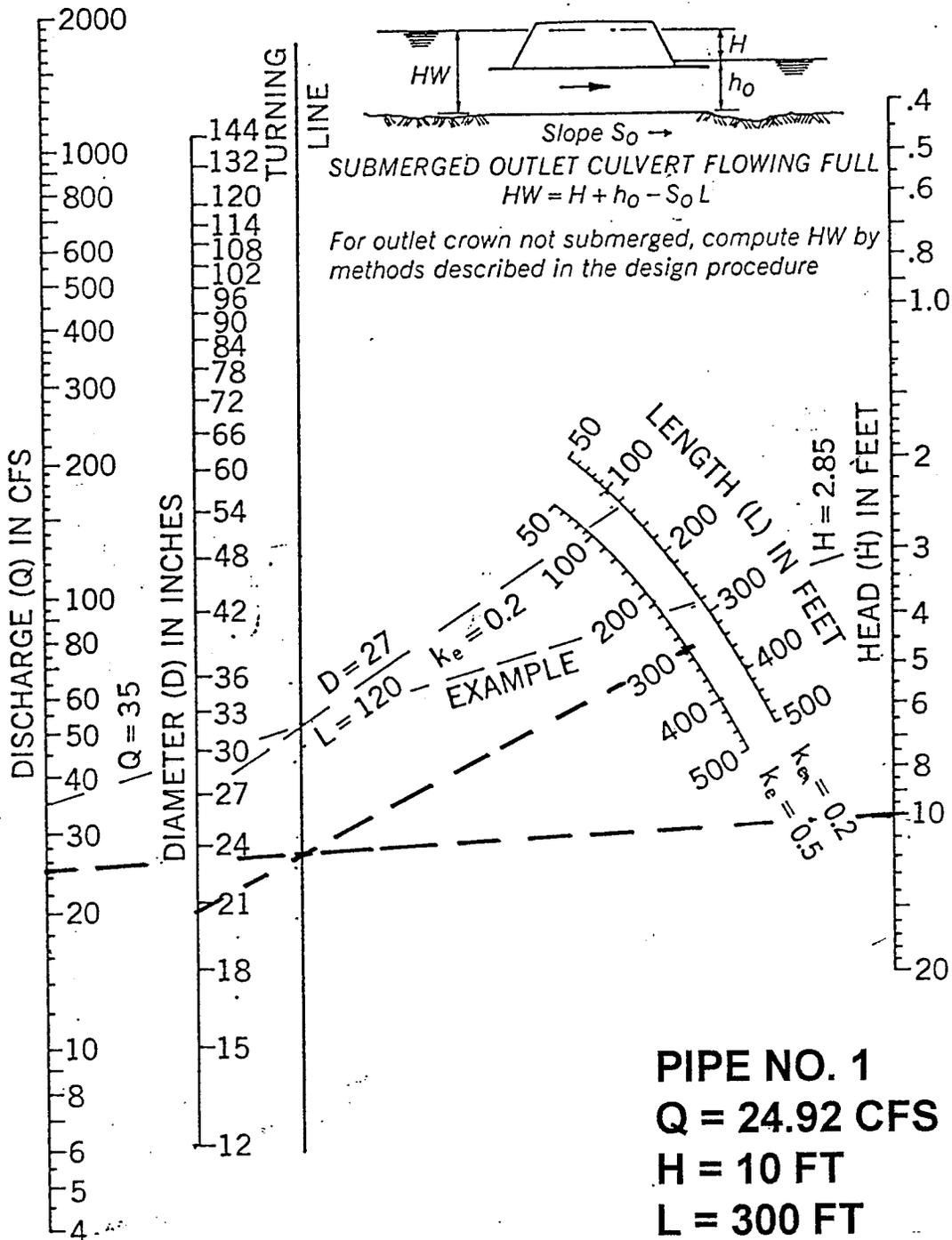
INFILTRATION RATE FOR
 PERVIOUS AREAS VERSUS
 RUNOFF INDEX NUMBERS

APPENDIX 3:
STORM DRAIN - SIZE ANALYSIS

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



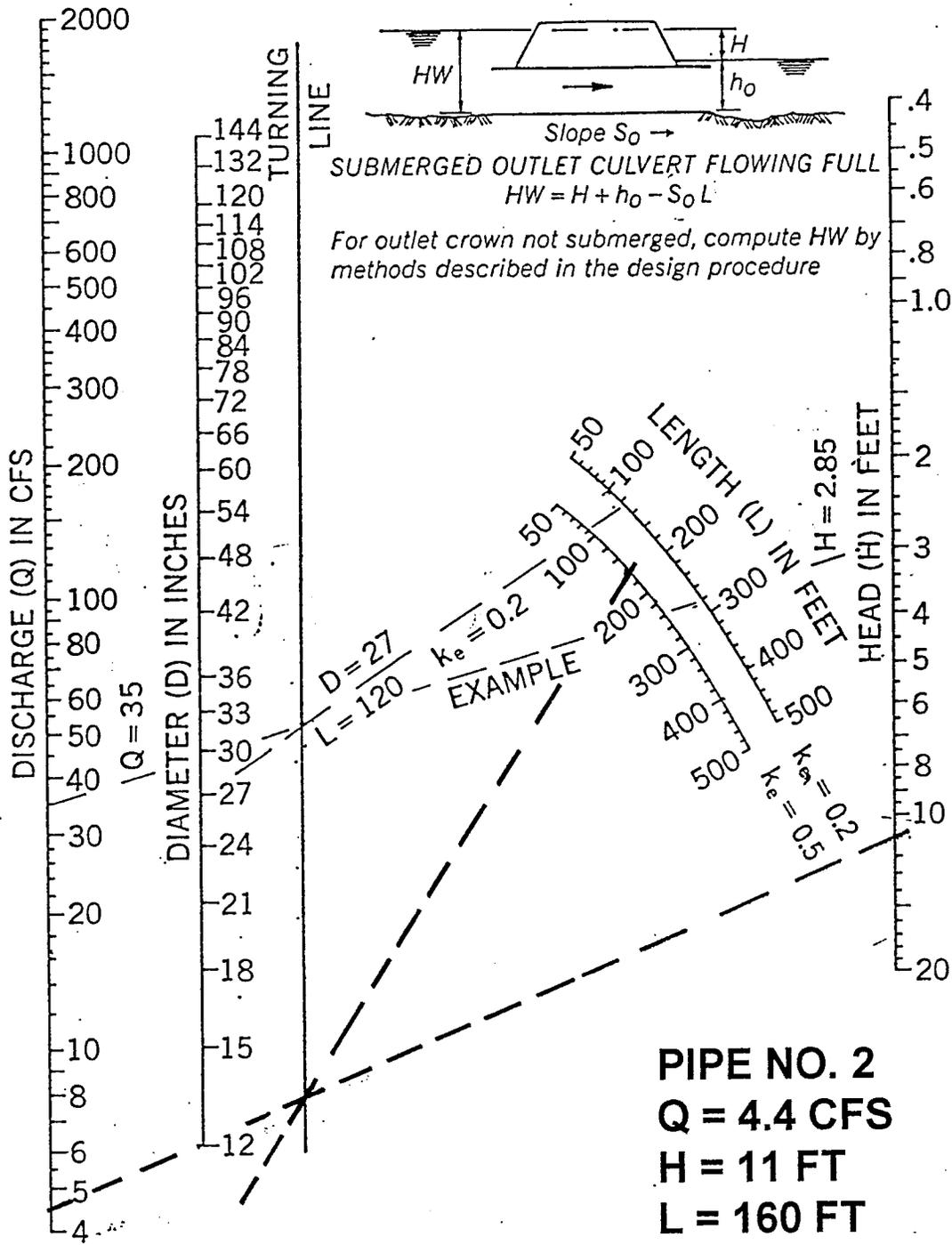
PIPE NO. 1
Q = 24.92 CFS
H = 10 FT
L = 300 FT
 $K_e = 0.5$

D = 21"

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



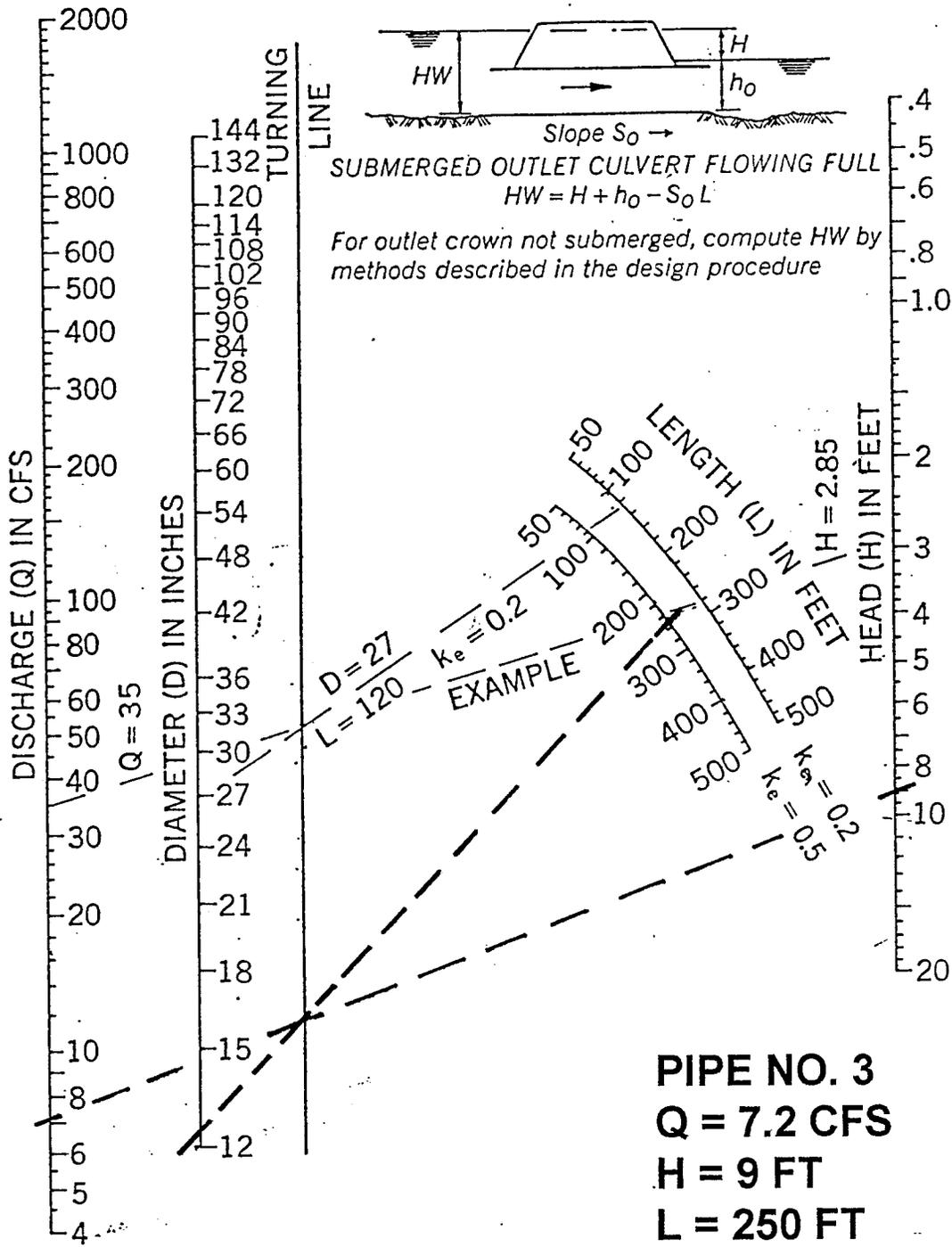
PIPE NO. 2
 $Q = 4.4$ CFS
 $H = 11$ FT
 $L = 160$ FT
 $K_e = 0.5$

$D = 12''$

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



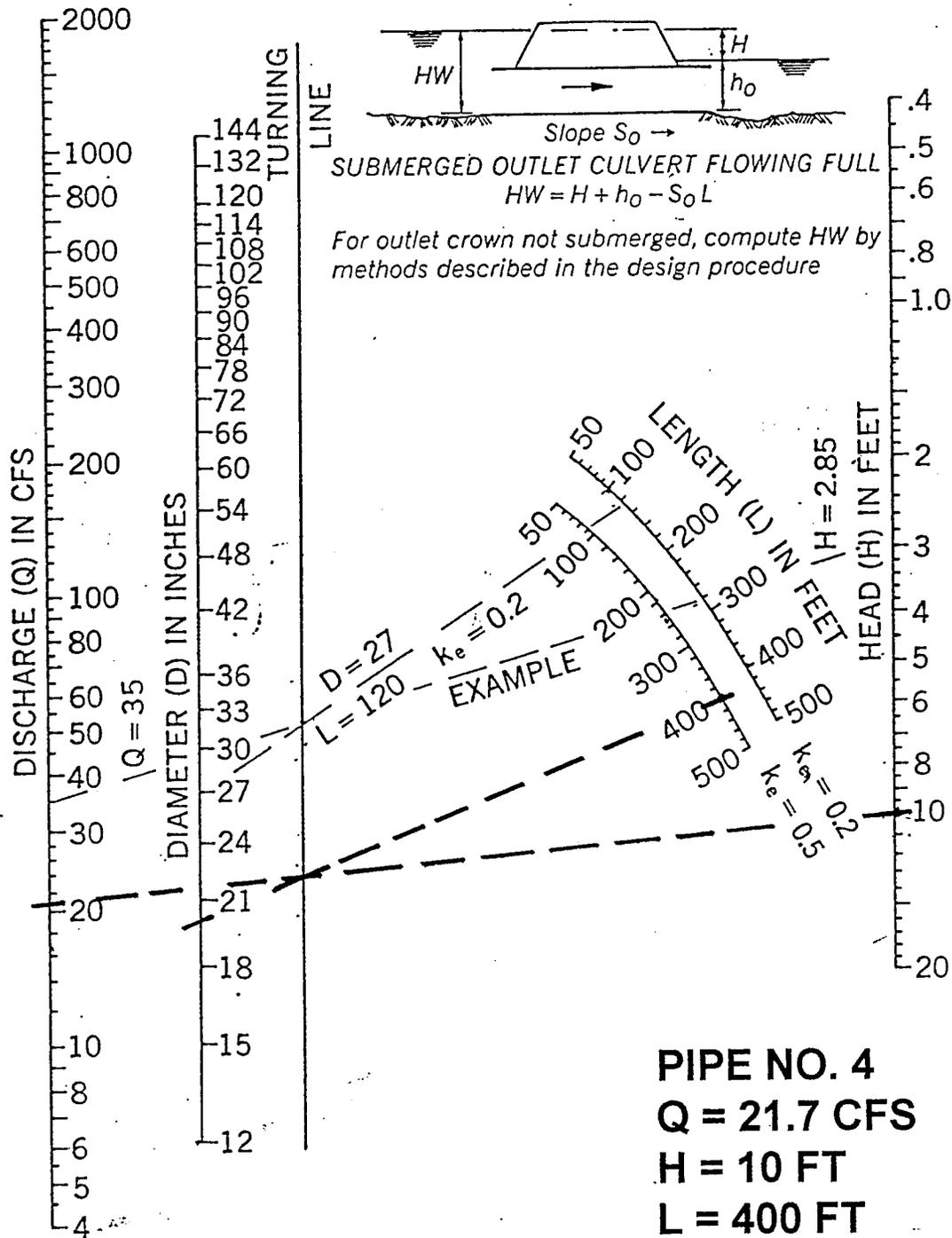
PIPE NO. 3
Q = 7.2 CFS
H = 9 FT
L = 250 FT
Ke = 0.5

D = 15"

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



PIPE NO. 4
Q = 21.7 CFS
H = 10 FT
L = 400 FT
 $K_e = 0.5$

D = 21"

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$

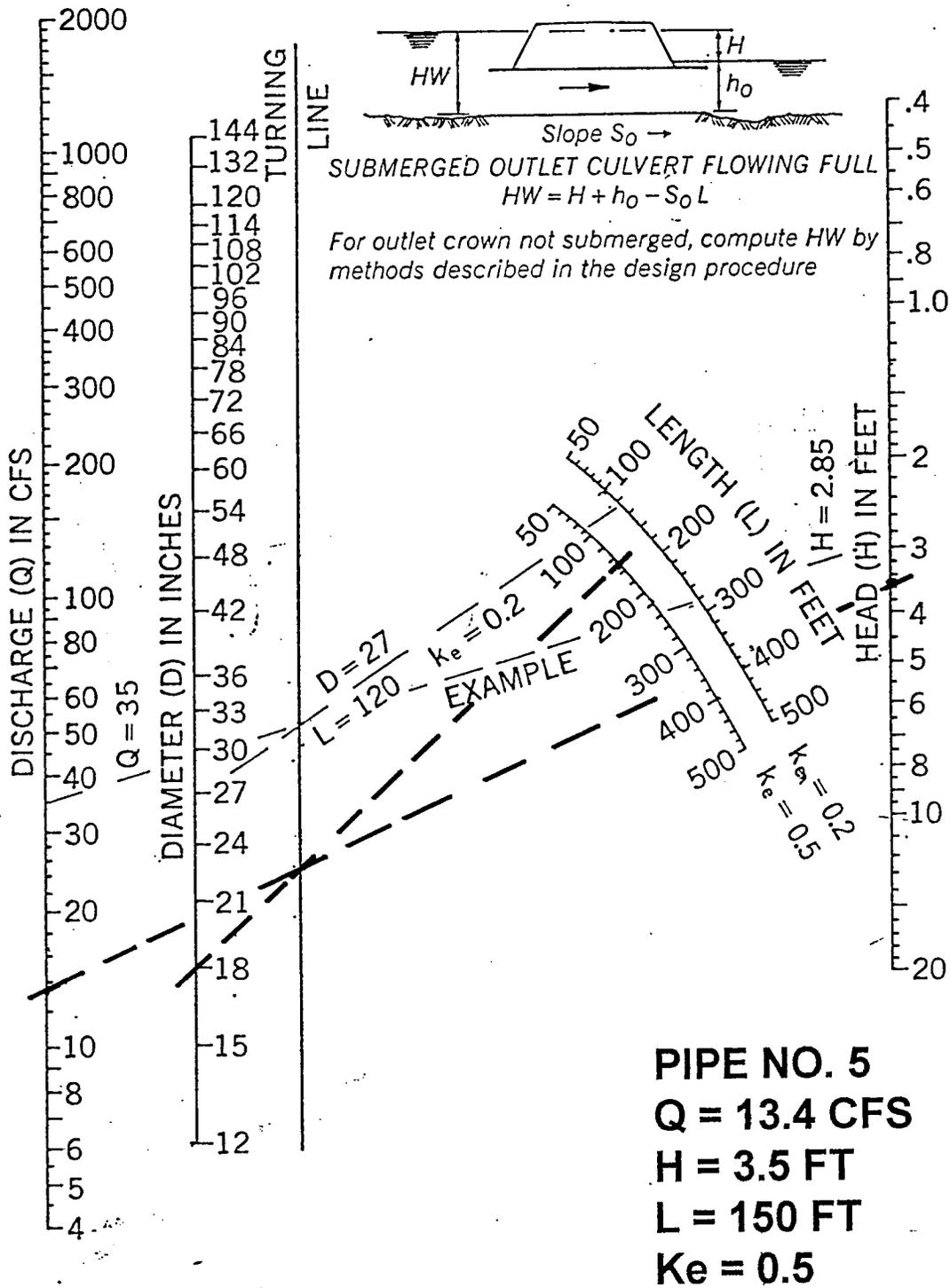
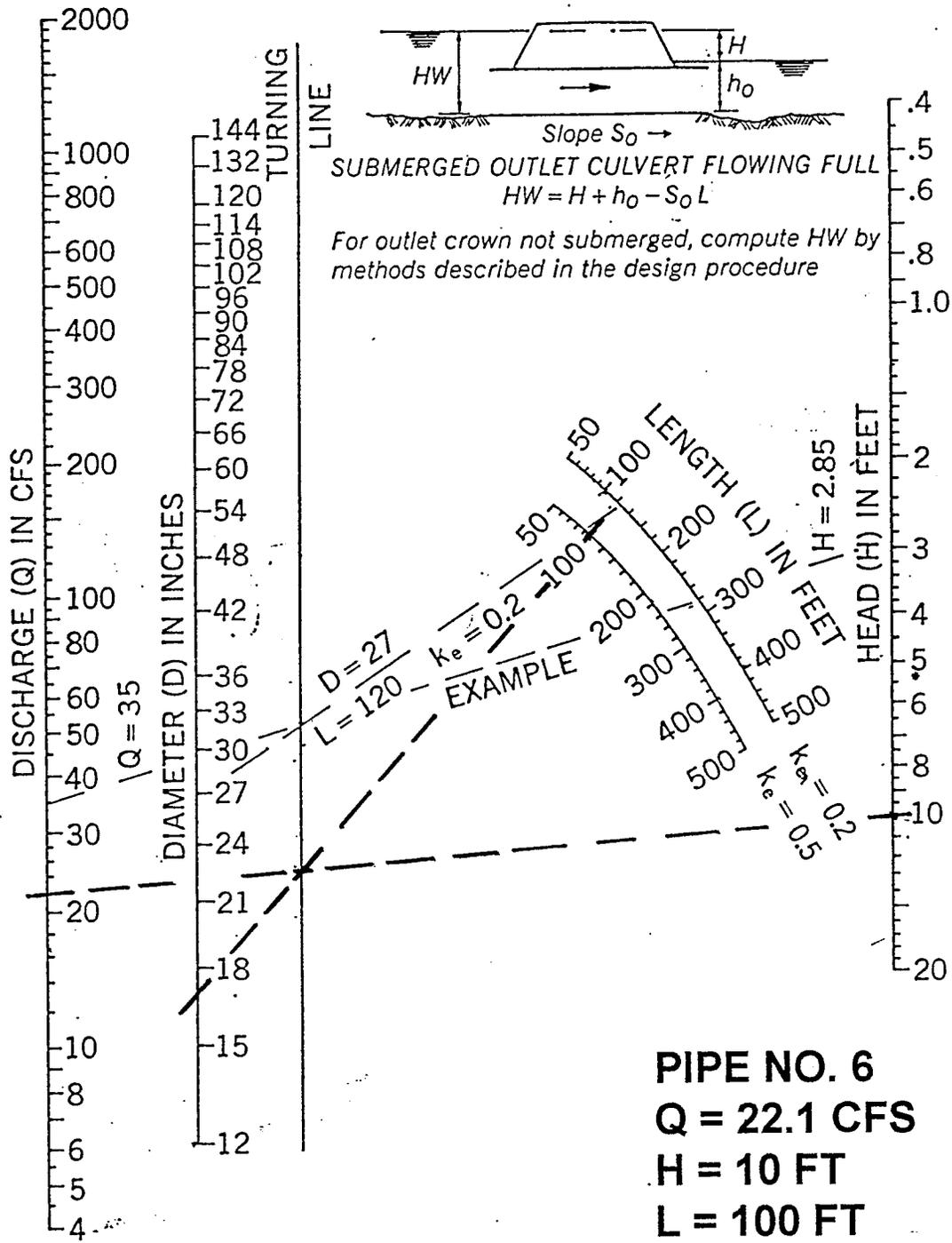


FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



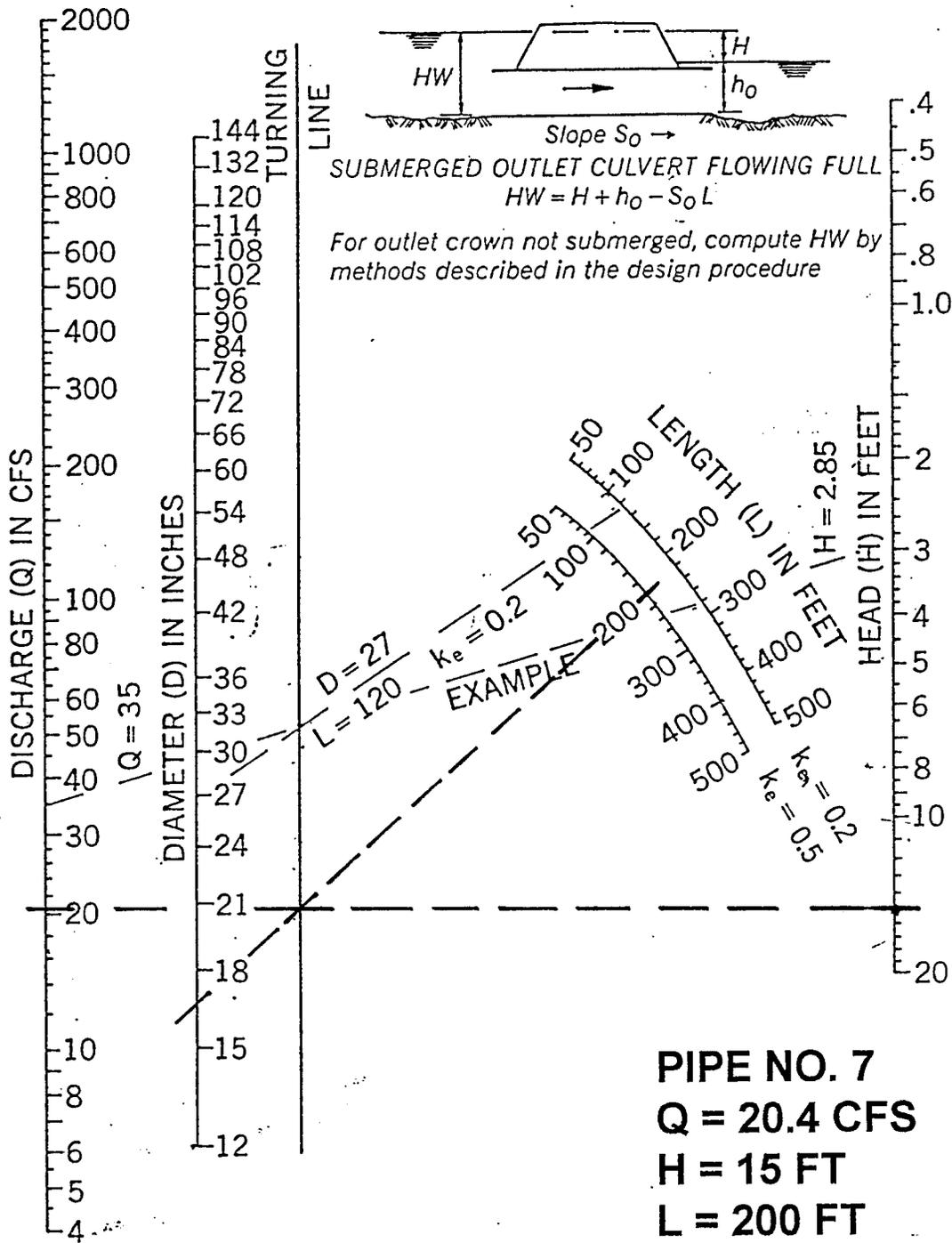
PIPE NO. 6
Q = 22.1 CFS
H = 10 FT
L = 100 FT
 $K_e = 0.5$

D = 18"

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



PIPE NO. 7
 $Q = 20.4$ CFS
 $H = 15$ FT
 $L = 200$ FT
 $K_e = 0.5$

$D = 18''$

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$

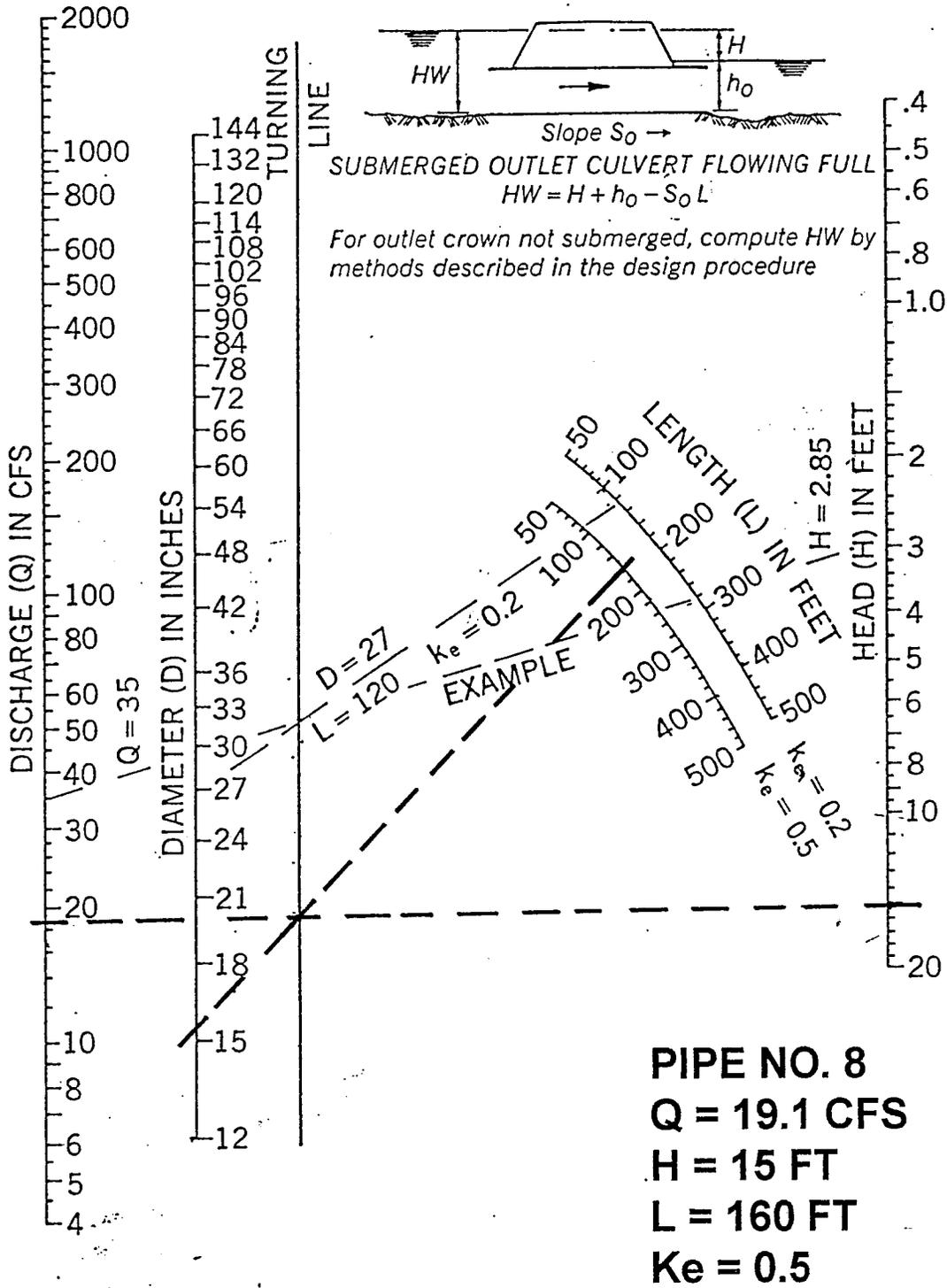
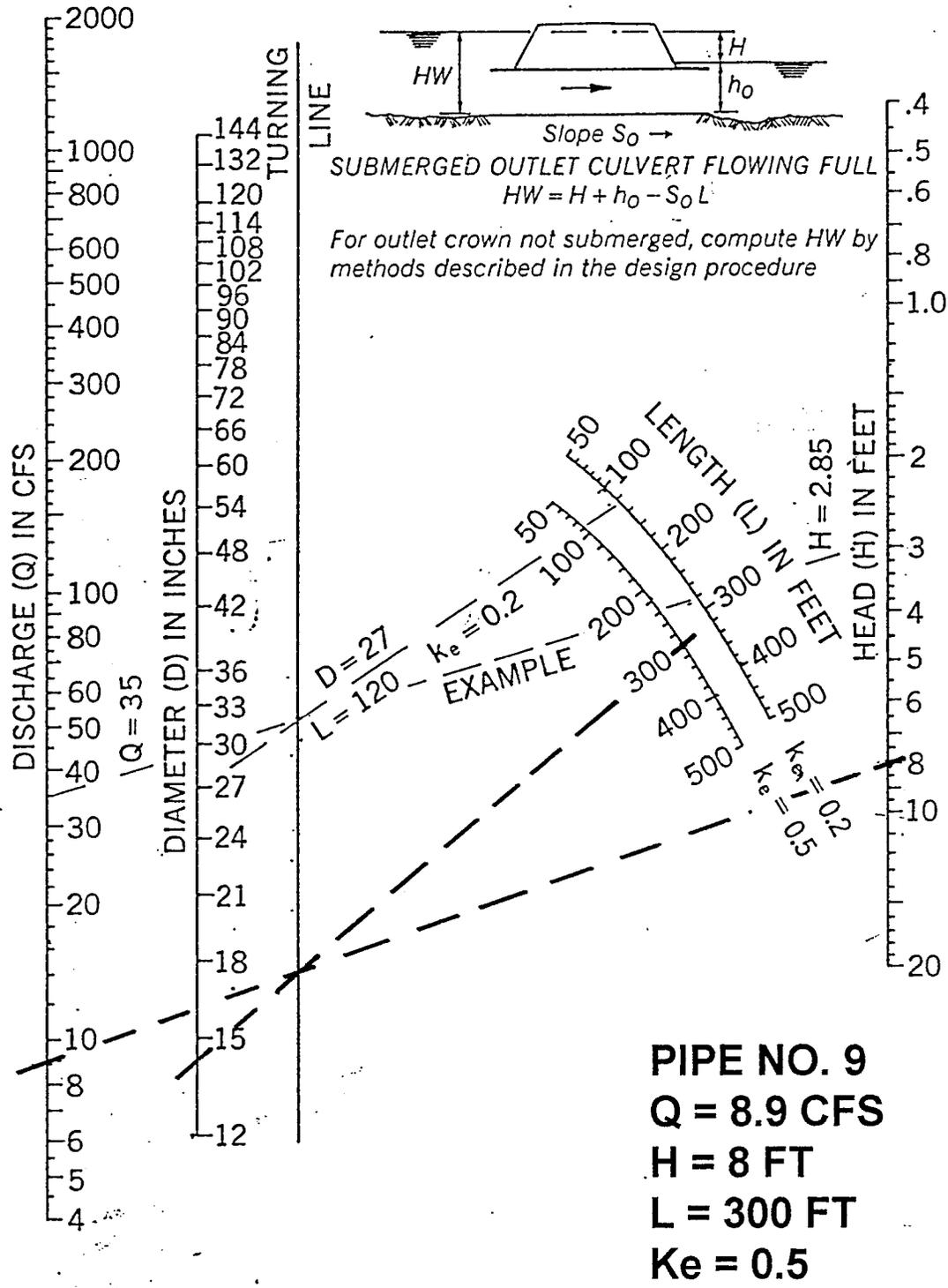


FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$



PIPE NO. 9
 $Q = 8.9$ CFS
 $H = 8$ FT
 $L = 300$ FT
 $K_e = 0.5$

$D = 15''$

FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$

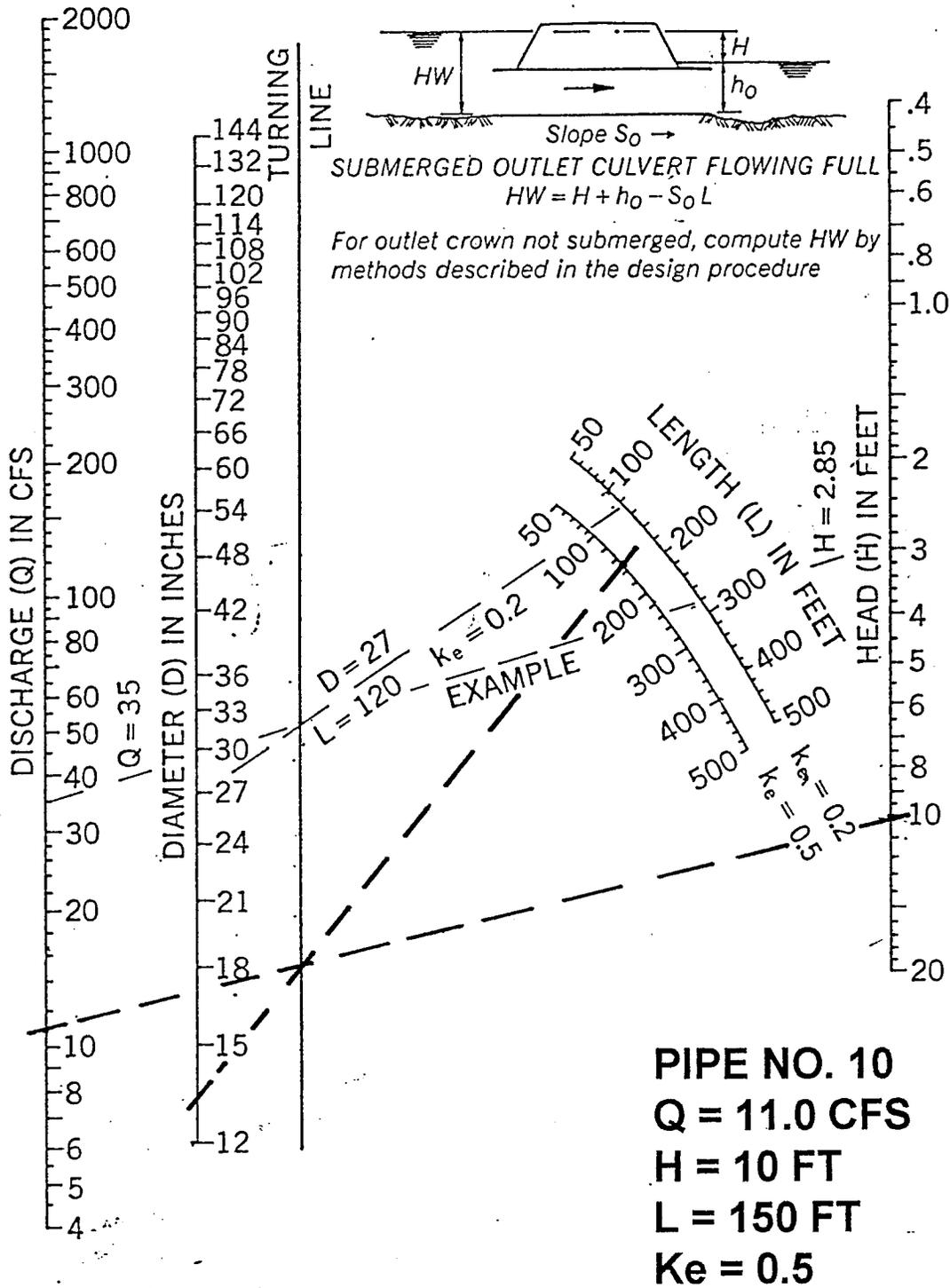


FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

$n = 0.012$

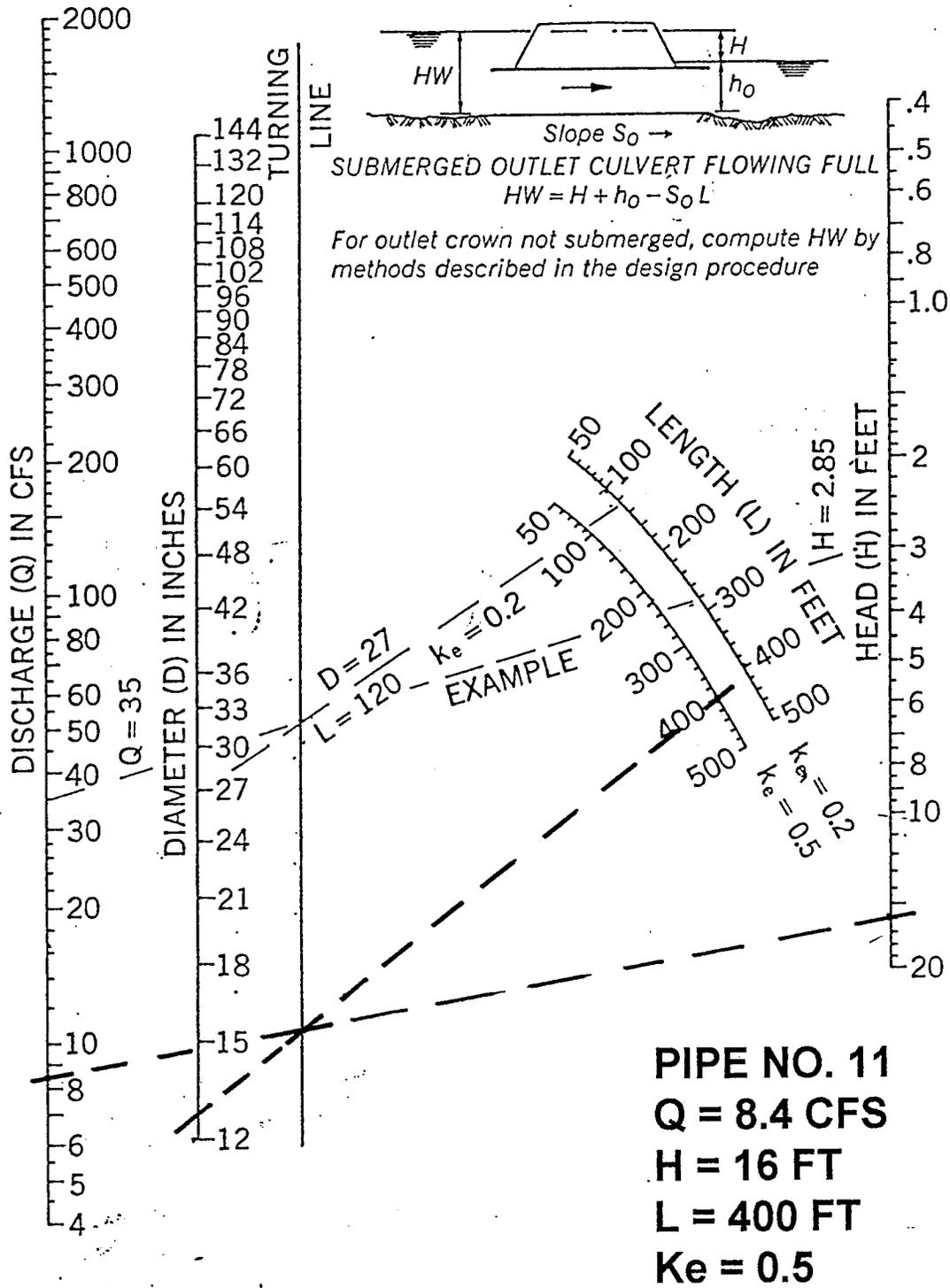
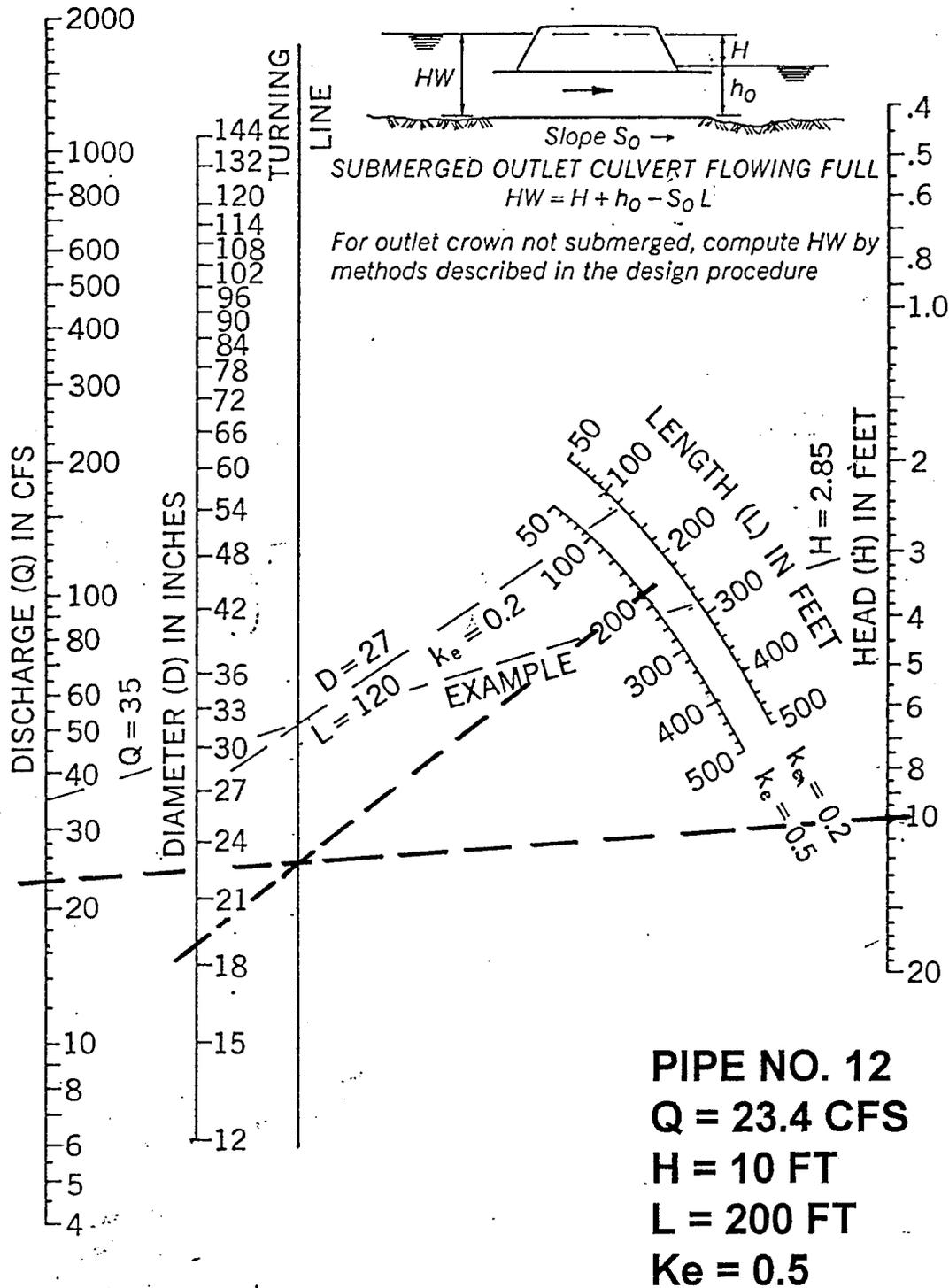


FIGURE 38

HEAD FOR CIRCULAR CONCRETE PIPE
CULVERTS FLOWING FULL

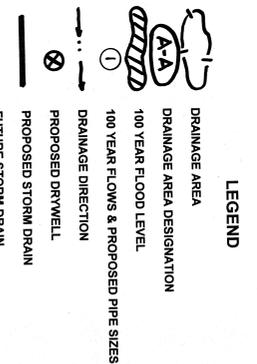
$n = 0.012$





FLOW TABLE

#	Q _{max}	PIPE SIZE
1	24.92 CFS	21" DIA
2	4.40 CFS	12" DIA
3	7.20 CFS	15" DIA
4	21.70 CFS	21" DIA
5	13.40 CFS	18" DIA
6	22.10 CFS	18" DIA
7	20.40 CFS	18" DIA
8	18.10 CFS	18" DIA
9	9.90 CFS	15" DIA
10	8.40 CFS	15" DIA
11	23.40 CFS	21" DIA
12		12" DIA
13	N/A	



HYDROLOGY PLAN

Appendix G

Agreements – CC&Rs, Covenant and Agreements and/or Other
Mechanisms for ensuring ongoing Operation,
Maintenance, Funding and Transfer of
Requirements for this project-specific WQMP
(See Final WQMP)

Infiltration Facility Inspection and Maintenance Checklist

Property Address: _____

Property Owner: _____

Treatment Measure No.: _____

Date of Inspection: _____

Type of Inspection: _____

Wet Season

Pre

Inspector(s): _____

After heavy runoff (1" or greater)

End of Wet Season Other: _____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Yes/No)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Standing Water	When water stands in the infiltration facility between storms and does not drain within 3 days after rainfall.			There should be no areas of standing water once inflow has ceased. Remove any sediment, debris or trash blockage within facility or around inlet.
2. Inlet/Outlet	Inlet/outlet areas clogged with sediment or debris, and/or eroded.			Material removed and disposed of properly so that there is no clogging or blockage in the inlet and outlet areas. Remove blockage and overflow (if any) is restored to design condition.
3. Miscellaneous	Any condition not covered above that needs attention in order for the infiltration facility to function as designed.			Meet the design specifications.

Infiltration Facility Maintenance Plan for Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to facility failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1. All facilities shall be operational, per City of Palm Desert requirements, upon removal of the storm water BMPs and prior to completion of construction.

Table 1		
Routine Maintenance Activities for Infiltration Basins		
No.	Maintenance Task	Frequency of Task
1	Remove obstructions, debris and trash from infiltration facility and dispose of properly.	Monthly, and as needed after storm events.
2	Inspect drywell to ensure that it drains between storms, and within 3 days after rainfall.	Monthly during wet season, and as needed after storm events.
3	Remove any trash, grass clippings, vegetation and other debris from the parking lot and upstream of the drywell and inlet.	As needed. Parking lot sweeping at a minimum as per frequency required by City of Palm Desert Street Sweeping ordinance(s).
4	Inspect infiltration facility using the inspection checklist.	Monthly, and after storm events 1" or greater, and after removal of accumulated debris or material.
5	Walk the project site and inspect buildings, landscape areas, irrigation systems, trash enclosures and other areas upstream of the infiltration facility which could impact the operation of the facility if not properly maintained.	Monthly, and as needed after storm events.

Mosquito Abatement

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation.

Inspections

The Infiltration Facility Inspection and Maintenance Checklist provided shall be used to conduct inspections monthly (and as needed), identify needed maintenance, and record maintenance that is conducted.

Appendix H

Phase 1 Environmental Site Assessment – Summary of Site
Remediation Conducted and Use Restrictions
(not applicable)

Appendix I

Project-Specific WQMP Summary Data Form

Project-Specific WQMP Summary Data Form

Applicant Information	
Name and Title	Doug Sheres – Managing Member
Company	Desert Wave Ventures, LLC
Phone	
Email	Doug@Paramocap.com
Project Information	
Project Name <small>(as shown on project application/project-specific WQMP)</small>	DSRT SURF
Street Address	
Nearest Cross Streets	Desert Willow Drive at Country Club Drive
Municipality <small>(City or Unincorporated County)</small>	Palm Desert
Zip Code	92260
Tract Number(s) and/or Assessor Parcel Number(s)	620-420-024, 620-420-023, 620-400-008
Other <small>(other information to help identify location of project)</small>	
Watershed	Whitewater River
Indicate type of project.	Priority Development Projects (Use an "X" in cell preceding project type):
	<input type="checkbox"/> SF hillside residence; impervious area \geq 10,000 sq. ft.; Slope \geq 25%
	<input type="checkbox"/> SF hillside residence; impervious area \geq 10,000 sq. ft.; Slope \geq 10% & erosive soils
	<input checked="" type="checkbox"/> Commercial or Industrial \geq 100,000 sq. ft.
	<input type="checkbox"/> Automotive repair shop
	<input type="checkbox"/> Retail Gasoline Outlet disturbing > 5,000 sq. ft.
	<input type="checkbox"/> Restaurant disturbing > 5,000 sq. ft.
	<input type="checkbox"/> Home subdivision \geq 10 housing units
	<input type="checkbox"/> Parking lot \geq 5,000 sq. ft. or \geq 25 parking spaces
Date Project-Specific PWQMP Submitted	To be Submitted 12/14/2018
Size of Project Area <small>(nearest 0.1 acre)</small>	17.8 acres
Project Area managed with Site Design or Low Impact Development (LID) BMPs <small>(nearest 0.1 acre)</small>	17.8 acres
Is the project subject to onsite retention by ordinance or policy?	Yes
Are Treatment Control BMPs required?	Yes
Name of the entity that will implement, operate, and maintain the post-construction BMPs	City of Palm
Contact Name	
Street or Mailing Address	
City	
Zip Code	
Phone	
Space Below for Use by City/County Staff Only	
Preceding Information Verified by <small>(consistent with information in project-specific WQMP)</small>	Name: Date:
Date Project-Specific WQMP Approved:	
Data Entered by	Name: Date:
Other Comments	