

CHAPTER 9 – ADMINISTRATION, OPERATION AND MAINTENANCE

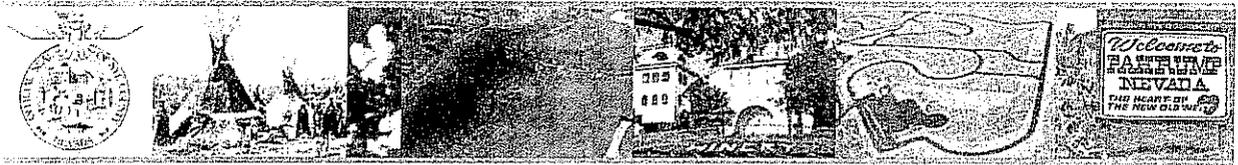
The administration, operation and maintenance requirements will evolve as construction occurs, systems age and storm damage occurs. Initially maintenance will be handled by Nye County Public Works crews. As the District constructs and completes projects, maintenance will be required along with administration of the District's affairs. The costs of Administration, Operation and Maintenance should be funded separately from construction bonds. It is recommended that the funding be supported by the residents and businesses within the District through fees, charges or ad valorem taxes.

Budget

The budget for Administration, Operation and Maintenance at the fifth year of the District would be as follows:

Administration	Annual Cost
General Manager / Chief Engineer	\$ 200,000
Senior Engineer	\$ 125,000
Administrative Assistance	\$ 40,000
Finance Officer	\$ 80,000
Billing Clerk	\$ 35,000
Clerk	\$ 25,000
Sub-Total	\$ 505,000
Salary Benefits (40%)	\$ 202,000
Equipment	\$ 60,000
Administration Total	\$ 767,000
Operation & Maintenance	Annual Cost
Inspector	\$ 60,000
Construction Crew (3 Man)	\$ 200,000
Salary Benefits (40%)	\$ 104,000
Vehicles	\$ 24,000
Construction Equipment	\$ 100,000
Vehicle Maintenance	\$ 10,000
Telephone / Equipment	\$ 5,000
Operation & Maintenance Total	\$ 503,000
Grand Total	\$1,270,000





Clark County Flood Control District

The Clark County Flood Control District is a mature district funded by a sales tax increment. Their current annual budget is \$90,000,000.00. Their budget breakdown is as follows:

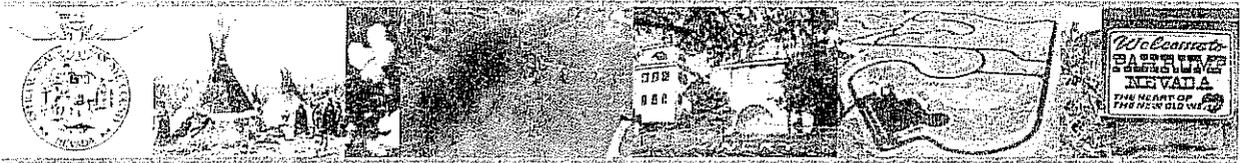
Administration	7.8%
Maintenance	9.6%
Capital Improvements	45.5%
Bond Payments	37.1%

Planned Facilities

The following summarized the channel and basin system:

• Number of Basins	42 each
• Surface Area of Basins	4333 Acres
• Storage Volume of Basins	15,806 Ac-Ft
• Length of Open Channel	70 Miles
• Area of Channel Grading	430 Acres
• Area of Lined Channel	256 Acres
• Developed Length of Closed Conduit	10 Miles
• Number of Major Street Crossings	15 each
• Number of Crossings at SR 160	15 each

Maintenance activities associated with the system will increase incrementally as the system develops.



CHAPTER 10 – INTERLOCAL AGREEMENTS

It is recommended that agreements be arranged with Clark County, the Nevada Department of Transportation and the local utility companies.

Clark County

The Wheeler Wash Dams will be in Clark County. The Clark County Flood Control District (CCRFCD) has expressed no interest in participating in the planning or construction of flood control facilities benefiting Nye County. They did say that they would entertain inter-local agreements allowing Nye County to construct and maintain facilities upstream of the Nye County basin. We believe that CCRFCD will lead the approval of inter-local agreements through Clark County's legal staff and County Board of Commissioners.

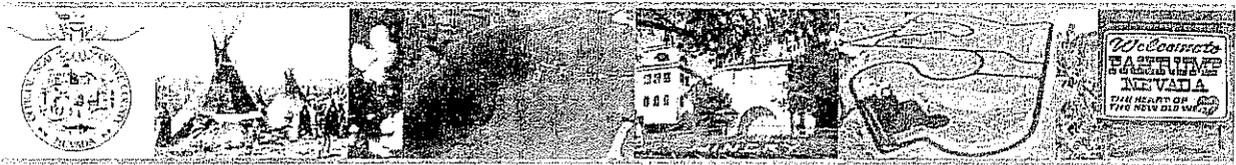
Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) requires permits to cross Nevada state highways. It would be prudent to approach them with the entire program so that they can review the hydrology, proposed solutions and contribute suggestions and solutions that solve their needs and concerns. This will speed up the process of obtaining encroachment permits for each crossing.

Local Utility Companies

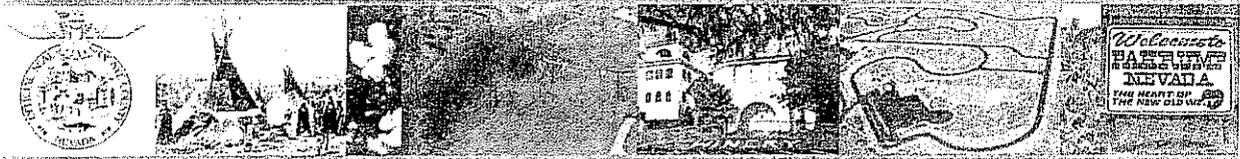
It will be necessary to coordinate the basin and channel locations with private utilities to avoid costly relocations and repairs.





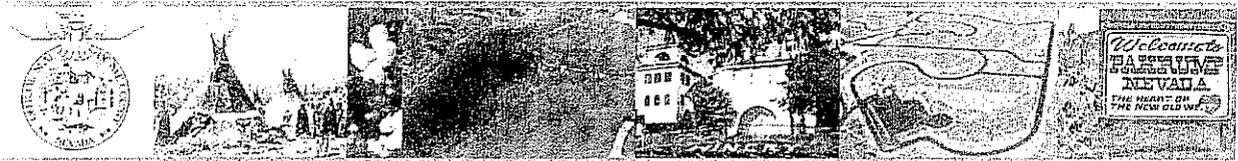
GLOSSARY

Annual Maintenance Cost	This is the cost of making repairs each year. This would involve mostly removing silt from basins and channels.
Assessed Improvements	The value determined by the Assessors office of site improvements, typically buildings. It is below the market value/building cost of the improvements.
Assessed Land	The value determined by Nye County's Assessor office of land. It is below the market value of the land.
Assessed Value	The value of property set by the County Assessor. It does not equal the property value which is set by market conditions.
Basin	Intercept, Intermediate, Regulation, Initiating, Retention and Detention all refer to different methods of operating an above or below ground structure designed to contain flood waters. Usually, <i>Retention</i> refers to holding most of the flood waters. <i>Detention</i> and <i>Regulation</i> refer to partial release. These basins release some of the flow in order to capture the peak flow which usually occurs during the middle of the storm.
Beltway	Roadway that provides a by-pass with limited intersections (access). For Pahrump, it is the roadway east of SR 160 from north of north Kellog Road to Tiffany Street.
Bonds	Bonds are financial documents that have a face value that is paid back in periodic payments (yearly, semi-annually, etc.) with interest and terms stated on the Bond.
Drainage Easement	This provides public agencies the right to enter private lands to operate and maintain drainage facilities.
Eminent Domain	The government's right to take private property for public use with compensation to the owner.
General Obligation Taxes	The right of the District to levy property taxes to operate government entities is limited by the State of Nevada Department of Taxation. (See "Local Government Syllabus of Nevada Revised Statues, NRS, and Administrative Code, NAC," located on page Appendix – 3)
Hydrology	This is the civil engineering study of the effects of rainfall on land and its generation of runoff. It involves the statistical analysis of rainfall and runoff data along with soil types, improvements and weather conditions. Computer simulation models are used to study large areas such as the Pahrump Valley.



GLOSSARY

- Q₁₀₀** This is an engineering term to describe the peak flow rate of storm water from a storm with a frequency of reoccurrence of once in 100-years. This is the flow rate used by the Federal Emergency Management Agency (FEMA) to construct flooding maps. Flooded areas (Zone-A) require special flood insurance. Flow rates for a given land area change with soil type and development as roads, walkways and building are impervious, i.e. impenetrable, to storm water.
- Revenue Bonds** These are sold by financial firms based on dedicated revenue streams such as user fees, special assessments and property taxes including general obligation taxes which a district would obligate a portion of to pay the periodic bond payments. Revenue bonds are secured by combinations of property values, ability to foreclose on property to make payment and reserve funds.
- Special Assessments** The Nevada Revised Statutes (NRS) provide the forming of districts under Nevada State Law to provide improvements to be paid by landowners over a period of time (20-30 years). NRS 271 provides for Special Improvement Districts to construct flood control, streets, lighting, parks, etc. projects. This type of District can be formed by a public process or by private developers. General Improvement Districts can be formed for the same purpose under NRS 318. In addition, General Improvement Districts can operate and maintain facilities, hire staff and acquire property.
- Taxes** This consists of sales tax, gasoline tax, property tax, government fees and special assessments. Local governments derive 20% to 45% of total revenue from real property taxes. Property taxes have two components that assess value of the property which is multiplied by the tax rate to achieve the tax. Land and improvements are separately taxed and added together to establish the property tax. Special assessments are added to the tax rate against property. They are generally established by acre. Developed property is property with a structure. Otherwise the property is undeveloped.
- Trapezoidal Channel** A channel with an invert bottom and two sides, or banks. Usually, the sides are sloped at 2:1 which refers the 2 horizontal measurements for every 1 vertical measurement. A 5-foot deep channel would have the banks extend horizontally 10-feet out until they hit the top.



**LOCAL GOVERNMENT SYLLABUS
NEVADA REVISED STATUTES (NRS) AND ADMINISTRATIVE CODE (NAC)**

TABLE OF CONTENTS

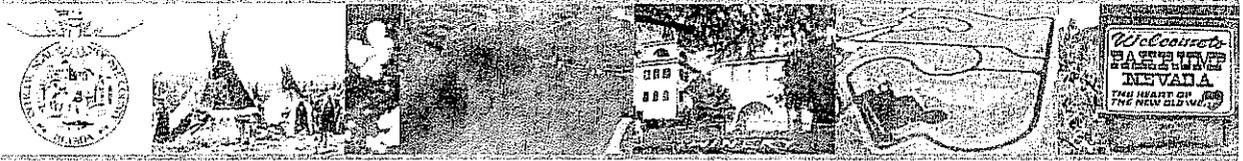
TYPES OF GOVERNMENTS:

• Counties	NRS 244	
• Cities	NRS 265	
Redevelopment Agencies	NRS 279	
• Towns	NRS 269	NRS 268
• General Improvement Districts	NRS 318	
o Exempt Districts Guidelines & References		
• Fire Districts	NRS 474	
• Hospitals	NRS 450	
• Fair and Recreation Boards	NRS 244	
Convention and Tourism Authorities		
• Libraries	NRS 379	NAC 379
• Inter-local Agreements	NRS 277	
• School Districts	NRS 387	NAC 387

ADMINISTRATION:

• Budget and Finance Act	NRS 354	NAC 354
o Budget Augmentation Guidelines & References		
• Municipal Obligations	NRS 350	NAC 350
o Medium-Term Obligation Guidelines & References		
• Public Investments	NRS 355	
• Depositories of Public Money and Securities	NRS 356	
• Purchasing Act	NRS 332	
• Open Meeting Laws	NRS 241	
o AGO Open Meeting Law		
o Open Meeting Checklist		
• Public Records	NRS 239	NAC 239
• Indigent	NRS 428	NAC 428
• Business Impact Statement	NRS 237	
o Guideline and References		
• Relations between Governments and Public Employees	NRS 288	NAC 288
• Impact Fees	NRS 278B	
• Sales/Use Tax	NRS 372	NAC 372
• Consolidated Tax Distributions	NRS 360	NAC 360
Basic City-County Relief Tax	NRS 377	NAC 372
Supplemental City-County Relief Tax	NRS 377	
Local School Support Tax	NRS 374	NAC 374
Cigarette	NRS 370	NAC 370





Pahrump Regional Flood Control District Service Plan - FINAL REPORT - June 2, 2008

Intoxicating Liquor	NRS 369	NAC 369
Real Property Transfer Tax	NRS 375	NAC 375
Governmental Services Tax	NRS 371	
• Property Tax / Assessment	NRS 361	NAC 361
Net Proceeds of Mines	NRS 362	NAC 362
• Tax on Rental of Transient Lodging	NRS 244	NAC 364
• Ballot Language Templates – Guidelines & References		





NRS: CHAPTER 308 – CONTROL OF SPECIAL DISTRICTS

TITLE 25 - PUBLIC ORGANIZATIONS FOR COMMUNITY SERVICE

CHAPTER 308 - CONTROL OF SPECIAL DISTRICTS

<u>NRS 308.010</u>	Short title; declaration of purpose.
<u>NRS 308.020</u>	Applicability; definition of “special district.”
<u>NRS 308.030</u>	Filing of service plan.
<u>NRS 308.040</u>	Resolution of approval required.
<u>NRS 308.050</u>	Scope of authority.
<u>NRS 308.060</u>	Criteria for disapproval of service plan.
<u>NRS 308.070</u>	Filing of service plan for proposed district; notice; public hearing; delivery of service plan to planning commission; notice of approval, disapproval or modification of service plan.
<u>NRS 308.080</u>	Requirements for approval of formation of special district by board of county commissioners; judicial review; formation; material modifications; filing of plans for additional acquisitions; injunction for unreasonable departure from service plan.

NRS 308.010 Short title; declaration of purpose.

1. This chapter may be cited as the Special District Control Law.
2. The Legislature hereby determines and declares that the procedures contained in the Special District Control Law are necessary for the coordinated and orderly creation of special district governments and for the logical extension of special district services throughout the State.
3. It is the purpose of the Special District Control Law to prevent unnecessary proliferation and fragmentation of local government, to encourage the extension of existing districts rather than the creation of new districts and to avoid excessive diffusion of local tax sources.

(Added to NRS by 1967, 1681; A 1977, 518)



NRS 308.020 Applicability; definition of “special district.”

1. The Special District Control Law applies to:

(a) Any special district whose formation is initiated by a board of county commissioners; and

(b) Any petition for the formation of any proposed special district filed with any board of county commissioners.

2. As used in this chapter “special district” means any water district, sanitation district, water and sanitation district, municipal power district, mosquito abatement district, public cemetery district, swimming pool district, television maintenance district, weed control district, general improvement district, or any other quasi-municipal corporation organized under the local improvement and service district laws of this state as enumerated in title 25 of NRS, but excludes:

(a) All local improvement districts created pursuant to chapter 309 of NRS; and

(b) All housing authorities.

(Added to NRS by 1967, 1681; A 1977, 518; 1997, 483)

NRS 308.030 Filing of service plan.

1. Any prospective petitioner for the establishment of a special district shall file a service plan with the board of county commissioners of each county which has territory included within the boundaries of the proposed district. The service plan shall:

(a) Consist of a financial survey and a preliminary engineering or architectural survey showing how the proposed services are to be provided and financed.

(b) Include a map of the proposed district boundaries, an estimate of the population and assessed valuation of the proposed district.

(c) Describe the facilities to be constructed, the standards of such construction, the services to be provided by the district, an estimate of costs, including the cost of acquiring land, engineering services, legal services, proposed indebtedness, including proposed maximum interest rates and any discounts, any other proposed bonds and any other securities to be issued, their type or character, annual operation and maintenance expenses, and other major expenses related to the formation and operation of the district.

(d) Outline the details of any arrangement or proposed agreement with any city or town for the performance of any services between the proposed special district and such city or town. The form of any such contract to be used, if available, shall be attached to the service plan.



È If a board of county commissioners initiates the formation of a special district, it shall prepare such a service plan as an appendix to its initiating resolution.

2. Except where the formation of a district is initiated by a board of county commissioners, each service plan filed shall be accompanied by a processing fee set by the board of county commissioners not to exceed \$200 which shall be deposited in the county general fund. Such processing fee shall be sufficient to cover the costs related to the hearing prescribed by NRS 308.070, including the costs of notice, publication and recording of testimony.

(Added to NRS by 1967, 1681; A 1977, 518)

NRS 308.040 Resolution of approval required.

1. If a proposed special district lies entirely within one county, a resolution approving the service plan is required from the board of county commissioners of that county.

2. If the boundaries of a proposed special district include territory within two or more counties, a resolution approving the service plan for such special district is required from the board of county commissioners of each county which has territory included in the proposed special district; but the boards of county commissioners of the respective counties may in their discretion hold a joint hearing on the proposed district in accordance with NRS 308.070.

(Added to NRS by 1967, 1682; A 1977, 519)

NRS 308.050 Scope of authority. The board of county commissioners of each such county constitutes the approving authority under the Special District Control Law and shall review any service plan filed for any proposed special district. With reference to the review of any service plan, each such board of county commissioners may:

1. Approve the service plan without condition or modification;
2. Disapprove the service plan for any of the reasons listed in NRS 308.060; or
3. Conditionally approve the service plan subject to the submission of additional information relating to or modifying the plan.

(Added to NRS by 1967, 1682; A 1977, 519)

NRS 308.060 Criteria for disapproval of service plan.

1. Each such board of county commissioners may disapprove the service plan of a proposed special district upon satisfactory evidence that:

(a) There is insufficient existing and projected need for organized service in the area to be serviced by the proposed district;





(b) The existing service in the area to be served by the proposed district is adequate for present and projected needs;

(c) Adequate service is, or will be, available to the area through municipal annexation by other existing municipal or quasi-municipal corporations within a reasonable time and on a comparable basis;

(d) The proposed special district is incapable of providing economic and sufficient service to the area within its proposed boundaries;

(e) The area to be included in the proposed district does not have or will not have the financial ability to discharge the proposed indebtedness, other securities, or other obligations to be incurred on a reasonable basis;

(f) The facility and service standards of the proposed district are incompatible with the facility and service standards of adjacent municipalities and special districts; or

(g) The proposed district is being formed for the primary purpose of financing the cost of developing private property.

2. Each such board of county commissioners may conditionally approve the service plan of a proposed district upon satisfactory evidence that it does not contravene any of the criteria enumerated in subsection 1. Final approval shall be contingent upon modification of the service plan to include such changes or additional information as shall be specifically stated in the findings of the board of county commissioners.

3. The findings of the board of county commissioners shall be based solely upon the service plan and evidence presented at the hearing by the petitioners, the planning commission and any interested party.

(Added to NRS by 1967, 1682; A 1977, 520)

NRS 308.070 Filing of service plan for proposed district; notice; public hearing; delivery of service plan to planning commission; notice of approval, disapproval or modification of service plan.

1. A service plan shall be filed with the board of county commissioners of each county in which the district is located, wholly or in part, prior to the formation of the proposed special district. Such service plan shall be filed with the county clerk at least 10 days prior to a regular meeting of the board of county commissioners. At the next regular meeting of the board of county commissioners immediately following the filing of a service plan with the county clerk, the board of county commissioners shall set a date for a public hearing on the service plan of the proposed district, which hearing date shall be within 30 days thereafter.



Pahrump Regional Flood Control District Service Plan - FINAL REPORT - June 2, 2008

2. The board of county commissioners shall provide written notice of the date, time and location of the hearing to:

(a) The petitioners;

(b) The county clerk of each other county in which the district is to be located, if any; and

(c) The governing body of any existing city, town or special district which has levied a general (ad valorem) property tax within the next preceding tax year and has boundaries within the county in which the district is located. Such governmental units are interested parties for the purposes of the Special District Control Law.

3. The board of county commissioners shall publish legal notice of the date, time, location and purpose of such hearing in a newspaper of general circulation within the county once each week for a period of 3 successive weeks by three publications, the first of which shall be at least 20 days prior to the hearing date. Such publications shall constitute constructive notice to the residents and property owners within the proposed district who are also interested parties at the hearing.

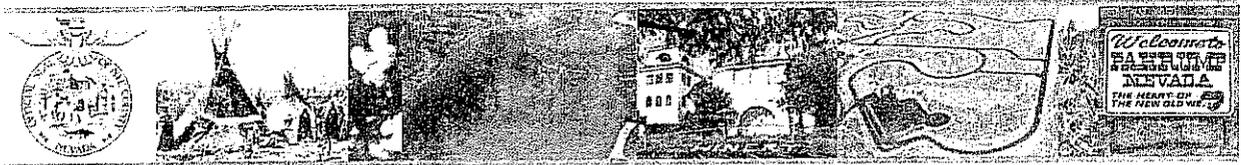
4. If there is a county planning commission or a regional county planning commission, the service plan submitted by the petitioners for the formation of the proposed district shall be delivered by the county clerk to each such planning commission. Each such county planning commission or regional county planning commission shall study such service plan and a representative thereof shall present its recommendations consistent with the Special District Control Law to the board of county commissioners at the hearing.

5. The hearing held by the board of county commissioners shall be open to the public and a transcript of proceedings shall be made. All interested parties as defined in this section shall be afforded an opportunity to be heard under such rules of procedure as may be established by the board of county commissioners. Any testimony or evidence which in the discretion of the board of county commissioners is relevant to the formation of the proposed district shall be considered.

6. Within 20 days after the completion of the hearing, the board of county commissioners shall advise in writing all interested parties of its action on the service plan. If the service plan is approved as submitted, a resolution of approval shall be issued. If the service plan is disapproved, the specific detailed reasons for such disapproval shall be set forth in writing. If the service plan is conditionally approved, the changes or modifications to be made in, or additional information relating to, the service plan together with the reasons for such changes, modifications or additional information shall also be set forth in writing, and the proceeding shall be continued until such changes, modifications or additional information are incorporated in the service plan. Upon the incorporation of such changes, modifications, or additional information in the service plan of the proposed district, the board of county commissioners shall issue a resolution of approval.

(Added to NRS by 1967, 1683; A 1977, 520)





NRS 308.080 Requirements for approval of formation of special district by board of county commissioners; judicial review; formation; material modifications; filing of plans for additional acquisitions; injunction for unreasonable departure from service plan.

1. Except as otherwise subsequently provided in this section, the formation of a special district shall not be approved by any board of county commissioners without the resolution of approval and the service plan required by the Special District Control Law. The approved service plan and the resolution of approval shall be incorporated by reference in the ordinance organizing the district after there has been a compliance with all other legal procedures for the formation of the proposed district. If the board of county commissioners fails to approve the service plan for any proposed special district and such failure is determined by any district court in this state for any county in which the district is located to be arbitrary, capricious or unreasonable, the court may order the formation of such district by the board of county commissioners of the county vested with jurisdiction as provided in NRS 318.050 without such resolution of approval; but an acceptable service plan in accordance with the provisions of the Special District Control Law, shall be filed with and approved by the court and incorporated by reference in and appended to the order of the court providing for the organization of the district after there has been a compliance with all other legal procedures for the formation of the proposed district. If the service plan is approved by the board of county commissioners, any interested party as defined in subsection 2 of NRS 308.070, if such party had appeared and presented his objections before the board of county commissioners, is entitled to appear and be heard at the hearing of the board of county commissioners so vested with jurisdiction for the organization of the district, and the district court may dismiss any pending legal proceedings contesting the failure of any board of county commissioners to approve a service plan upon a determination that the decision of the board of county commissioners was not arbitrary, capricious or unreasonable.

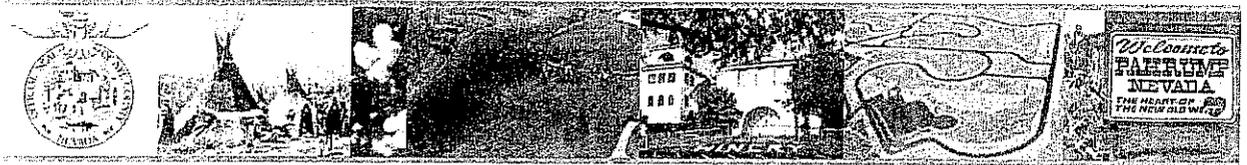
2. Upon final approval by a board of county commissioners for the formation of the special district, the facilities, services and financial arrangements of the district shall conform to the approved service plan.

3. After the organization of a special district pursuant to the provisions of chapter 318 of NRS, material modifications of the service plan as originally approved may be made by the board of such special district only by petition to and approval by the board of county commissioners of each county in which the district is located in substantially the same manner as is provided for the approval of an original service plan, except that the processing fee for such modification procedure shall not exceed \$100. Such modifications are required only with regard to changes of a basic or essential nature and are not required for changes of a mechanical type necessary only for the execution of the original service plan.

4. Any unreasonable departure from the service plan as originally approved, or, if the same has been modified, then from the service plan as modified, may be enjoined at any time by a district court upon motion of any board of county commissioners from which a resolution of approval is required by the Special District Control Law, or upon the motion of any interested party.

(Added to NRS by 1967, 1684; A 1977, 522)





Pahrump Regional Flood Control District Service Plan – FINAL REPORT – June 2, 2008

HYDROLOGIC RECOMMENDATIONS REPORT

The following pages are excerpts from *Hydrologic Recommendations Report for The Pahrump Storm Water Drainage & Flood Control Master Plan*, prepared jointly by RCC Group, LLC and Southwest Hydrology & Hydraulics, LLC.



Pahrump Regional Flood Control District Service Plan - FINAL REPORT - June 2, 2008

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May 11, 2007

Mr. Don Allison, PE
Bureau Veritas North America, Inc.
4840 West University Avenue
Las Vegas, Nevada 89103

Subject: Hydrologic Recommendations Report for the Pahrump Storm Water
Drainage & Flood Control Master Plan - Pahrump, Nevada

Dear Mr. Allison:

The RCC Group, LLC, in association with Southwest Hydrology & Hydraulics, LLC, is pleased to submit the Hydrologic Recommendations Report for the Pahrump Storm Water Drainage & Flood Control Master Plan (Hydrologic Report) for your review and consideration. The Hydrologic Report proposes guidelines for various hydrologic criteria, such as the design storm criteria, depth area reduction factors, adjustments to precipitation, hydrometeorologic references and other design criteria. We thank you for the opportunity to perform this important work, and look forward to assisting Bureau Veritas North America, Inc. and their Clients in the future.

If you or your associates have any questions regarding the Hydrologic Report, or if we can be of assistance on any other matter, please do not hesitate to contact Mr. Douglas Blatchford via <mailto:swhh@cox.net> or 702-469-3328. Similarly, you may contact Mr. Richard Casias via <mailto:rccgroup@earthlink.net> or 530-758-8128, and we will respond accordingly.

Sincerely,

Douglas B. Blatchford

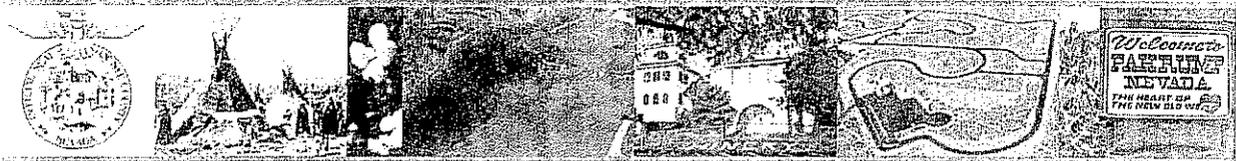
Douglas B. Blatchford, PE
Southwest Hydrology & Hydraulics, LLC

Richard C. Casias

Richard C. Casias, CA-P.G., R.E.A., Q.E.P.
Managing Member - RCC Group, LLC

Enclosures





Hydrologic Recommendations Report for the Pahrump Storm Water
Drainage & Flood Control Master Plan – Pahrump, Nevada

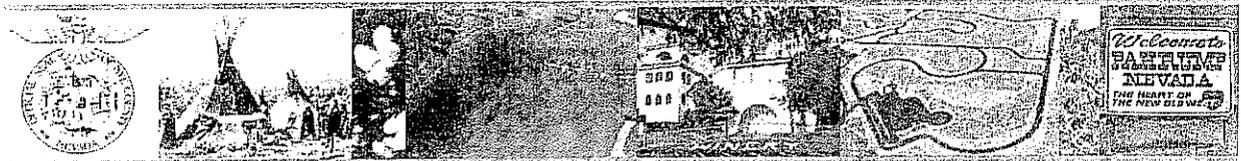
Table of Contents

1.0 Introduction.....	1
1.1 Background.....	1
2.0 Supporting Documentation.....	4
2.1 NOAA Publications.....	4
2.2 USGS.....	6
2.3 FEMA.....	8
2.4 USACE.....	9
2.5 CCRFCD.....	10
2.6 Tri Core.....	14
2.7 Other studies.....	14
3.0 Regional Context.....	17
3.1 Design Storm.....	17
3.2 Precipitation Adjustment Factors.....	17
3.3 USGS Regression Curves.....	20
3.4 Stream Gauging Stations.....	20
4.0 Hydrologic Modeling.....	23
4.1 Approach.....	27
5.0 Conclusions.....	27
6.0 Recommendations.....	28
6.1 Design Storm.....	28
6.2 Hydrometeorologic Reference.....	28



RCC LLC





Pahrump Regional Flood Control District Service Plan – FINAL REPORT – June 2, 2008

Hydrologic Recommendations Report for the Pahrump Storm Water Drainage & Flood Control Master Plan – Pahrump, Nevada

6.3 Depth Area Reduction Factors (DARFs).....29

6.4 Non-urban Adjustments.....29

6.5 Non-urban Detention Basin Designs.....30

6.6 Urban Adjustments.....31

6.7 Update FEMA Studies.....31

7.0 References.....32

Figures

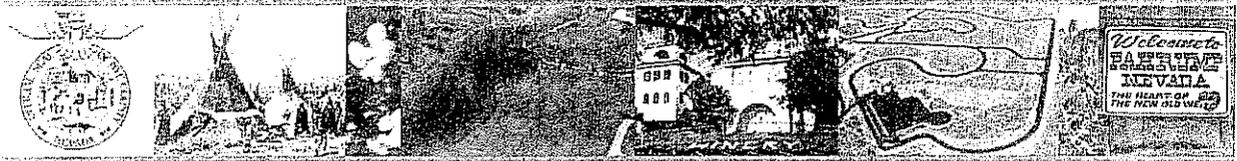
- Figure 1 – Location Map
- Figure 2 –Oblique Aerial Photograph
- Figure 3 - NOAA Atlas II, VII, 6-hr 100-yr Isopluvials
- Figure 4- NOAA Atlas 14, 6-hr, 100-yr Isopluvials
- Figure 5- NOAA Atlas II vs NOAA Atlas 14 along Latitude 36.15" North
- Figure 6 – USGS Regression 100-yr Frequency: Southern Nevada
- Figure 7 - FIRM Index for Nye County
- Figure 8 - Depth Area Reduction Curves for Clark County, Nevada
- Figure 9 - Storm Comparison
- Figure 10- Cumulative Rainfall Comparison
- Figure 11 - Watershed Boundaries
- Figure 12 - Rainfall Depth Comparisons
- Figure 13 - 100-yr Depth Duration Comparisons
- Figure 14 - Design Storm Depth Area Curves
- Figure 15 - SB County vs USGS 10-yr Peak Flow Estimates
- Figure 16 - SB County vs USGS 100-yr Peak Flow Estimates
- Figure 17 - Flood Frequency in Nevada



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Hydrologic Recommendations Report for the Pahrump Storm Water Drainage & Flood Control Master Plan – Pahrump, Nevada

Figure 18 – Design Storm Centering

Figure 19 – Runoff Comparisons

Tables

Table 1 - Summary of USGS Regression Equations for Southern Nevada

Table 2- Tri-Core vs USACE Rainfall Depth (in) for Wheeler Wash

Table 3 – Clark County Precipitation Adjustment Ratios

Table 4 - Watershed Summary - Pahrump

Table 5- Comparisons of Peak Discharge for CN=88 vs 71

Table 6 – 24-hr Storm Results for Wheeler Wash

Table 7 – Modified DART's CN=88 is Assumed for Undeveloped Watersheds



RCC

110





Hydrologic Recommendations Report for the Pahrump Storm Water
Drainage & Flood Control Master Plan - Pahrump, Nevada

1.0 Introduction

Bureau Veritas North America, Inc. (BVNA) was retained to evaluate and prepare a Hydrologic Recommendations Report (Hydrologic Report) for the Pahrump Storm Water Drainage & Flood Control Master Plan. The Pahrump Regional Planning District of Nye County, Nevada, is in the process of developing and updating a Storm Water Drainage & Flood Control Master Plan, which—in addition to establishing hydrologic criteria for the design of drainage related infrastructure—provides for facilities plans and associated facility costs. This hydrologic report makes recommendations on critical hydrologic criteria, such as the design storm, use of depth area reduction factors, the need for precipitation adjustment factors, and other criteria necessary to establish storm water standards. To facilitate the independent preparation of these recommendations, BVNA directed RCC Group LLC, and its local expertise, Southwest Hydrology & Hydraulics, LLC, to draft them for consideration. It is noted that this report is also limited in scope; further work may be necessary should recommendations be adopted.

1.1 Background

Pahrump, Nevada, is located in the south half of Nye County, which covers 18,064 square miles, and is the largest county in Nevada and the third largest county in the United States. The county seat is located 165 miles north of Pahrump in the city of Tonopah. Pahrump is 60 miles west of Las Vegas and 60 miles east of Death Valley, California, in a valley that is about 26 miles long and ranges from 8 to 12 miles wide. Surrounding the Pahrump valley is the Spring Mountain range to the east and the Nopah Mountains to the west. As of January 1st, 2007 there were an estimated 45,000 residents in the Pahrump Valley, growing at about 15% per year.

Nye County is part of the Basin and Range Physiographic Province, characterized by a series of mountain blocks and valleys generally trending north-south. Nye County is also a part of the Great Basin of the American southwest, characterized by internal drainage patterns, which allows for storm runoff to drain into the center of numerous valleys and accumulate in old lake beds (playas). The elevation in Pahrump ranges from 2,550 to 2,750 feet above mean sea level (amsl), however, the entire watershed draining into Pahrump from the Spring Mountains ranges from 11,000 feet amsl.

Most major storm flows draining into Pahrump originate in the Spring Mountains. The terrain of the Spring Mountains varies greatly, from forested areas at about 10,000 feet, to an alluvial piedmont immediately east of Pahrump. Drainage patterns on the alluvial piedmont are often unpredictable, as sediment laden flood waters are given to avulsion, and may jump from one active channel to another. Surficial alluvial landforms found in Pahrump are typically found throughout the American southwest.



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Hydrologic Recommendations Report for the Pahrump Storm Water
Drainage & Flood Control Master Plan – Pahrump, Nevada

6.0 Recommendations

The following recommendations offer general guidelines for hydrologic criteria, given the limited scope of work for this report. Should these recommendations be incorporated into the Nye County Storm Water Drainage and Flood Control Master Plan, more detailed analysis should be performed.

6.1 Design Storm

The 4th draft of the *Nye County Storm Water Drainage and Flood Control Master Plan* uses 24-hr design storm. This was due to arbitrarily adjusting runoff number higher, to offset the effect depth area reduction factors, as outlined in Section 6.0 of the draft manual (dated May 5, 2006). The 100-yr, 100 square mile 24-hr design storm was estimated to be 48,680 cfs. This value is more than twice the average USGS regression value. Given the model results and the references cited in this Hydrologic Report, it is recommended the 6-hr, 100-yr design storm should be used.

Recommendation:

- Use a 6-hr, 100-yr design storm.

6.2 Hydrometeorologic Reference

NOAA Atlas 14 is the latest effort to modernize rainfall-duration-depth values, based on a probabilistic approach. Values presented in NOAA Atlas 14 are higher than NOAA Atlas II, and are therefore closer to calibrated models for urban areas such as the Las Vegas Valley.

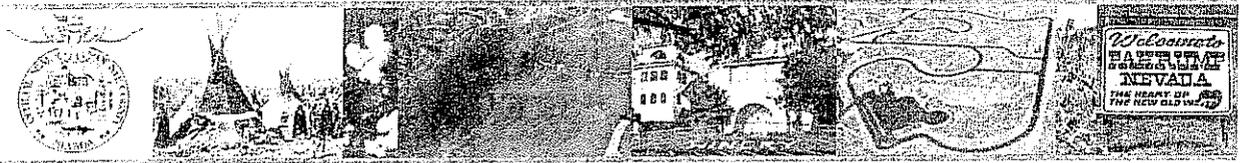
Recommendation:

- Adopt NOAA Atlas 14 and the information from the Precipitation Frequency Data Center, located for Pahrump at:
 - http://hdsc.nws.noaa.gov/hdsc/ofds/sa/ny_pfds.html.



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Pahrump Regional Flood Control District Service Plan – FINAL REPORT – June 2, 2008

Hydrologic Recommendations Report for the Pahrump Storm Water
Drainage & Flood Control Master Plan – Pahrump, Nevada

6.3 Depth Area Reduction Factors (DARFs)

DARFs estimate reduction in rainfall intensity given a storm's aerial extent. The use of DARFs is common throughout the arid southwest, including southern Nevada.

Recommendation:

- Adopt DARF's similar to CCRFCD, such as those published in the CCRFCD HC&DDM, or published in Hydro-40.

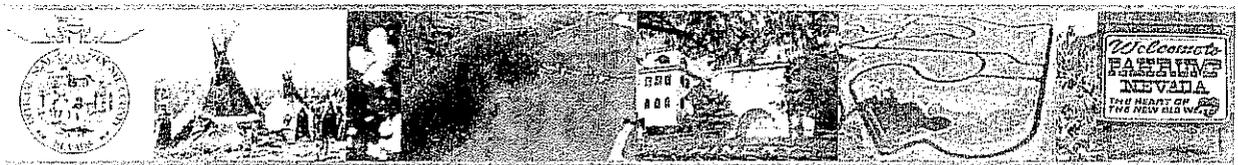
6.4 Non-urban adjustments

Given that much of the Wheeler Wash and adjacent watersheds is alluvial piedmont, future criteria should consider a reduction factor that accounts for infiltration, evaporation, dry soil conditions, and storage. The Reilly –Piechota (2005) study calibrated the 100-yr runoff for undeveloped desert, poor conditions, Type D soils by reducing curve runoff numbers, from 88 to 71. Similar reductions should be considered if criteria relies on SCS based modeling, typically used by the southern Nevada engineering community. The engineering community is likely to use a curve number of 88 for the Wheeler Wash watershed, and so, direction should be given by Nye County. Such direction could revise curve number values, for undeveloped, alluvial watersheds, or use higher depth area reduction factors. For example, higher depth area reduction factors were applied to effectively calibrate a rainfall runoff model using a curve number of 88 for undeveloped desert. The modified DARF's effectively lowered the output to match a curve number of 71 (see Table 7). Comparison of the 100-yr flowrate shows that this reduction is only 18% of the average USGS flowrate for a 100 square mile storm, and approximately 10,000 cfs less than using a curve number of 88 for the 6-hr, 100-yr, 100 square mile storm. *Hromadka (1996)* indicates that the 6-hr, 100-yr storm event is 54% less in San Bernardino County than USGS values, assuming AMCII conditions. It is therefore likely -- assuming AMCII conditions for the arid Spring Mountain piedmont—that the actual 100-yr value is between 18-54% less than the USGS 100-yr value.



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Hydrologic Recommendations Report for the Pahrump Storm Water
 Drainage & Flood Control Master Plan - Pahrump, Nevada

Table 7
Modified DARF's if CN=88 is Assumed for Undeveloped Watersheds

Area (Sq Mi)	DARF	100-yr discharge (cfs) CN=71	Modified DARF	100-yr discharge (cfs) CN=88
5	.91	2354	.60	2388
10	.86	2985	.56	3211
25	.76	3417	.46	3526
50	.68	4143	.42	4284
75	.64	4190	.38	4275
100	.60	3787	.35	3959

Recommendation:

- Develop hydrologic criteria that includes a reduction factor for undeveloped, desert alluvial fans upstream of Pahrump, assuming the southern Nevada engineering community will use an SCS curve runoff number of 88 for Type D desert soils under poor conditions.

6.6 Non-urban detention basin design

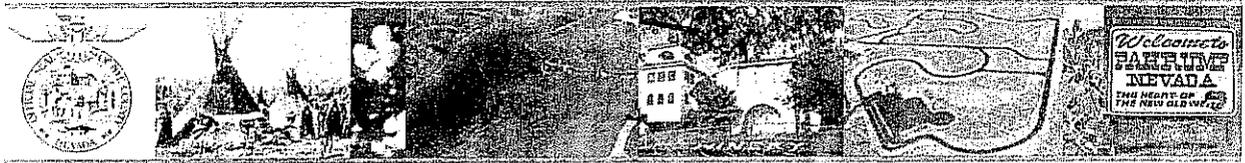
Although the above recommendation for reducing peak discharge applies to peak runoff from the Spring Mountains, it is uncertain if a reduction in volume may also be applied. The FIS reported that the Spring Mountains experience worst case storms from September to March, albeit convective in nature. Detention basin design is dependent on capturing the full volume of the hydrograph, that is, all the rainfall of a 6-hr design storm. It is uncertain if convective storms during winter months would generate longer durations, and higher design volume, for the Spring Mountains. Given the relatively high risk associated with detention basin design and function, more work should be done to investigate hydrologic conditions associated with detention of storm flows on the Spring Mountains. This further work may include a combined rainfall and snowmelt analysis.

It is important to note that the USACE accepted Tri-Core modeling efforts using a 6-hr, 100-yr storm for detention basin design. Tri-Core's values were within an acceptable range to the



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Pahrump Regional Flood Control District Service Plan – FINAL REPORT – June 2, 2008

Hydrologic Recommendations Report for the Pahrump Storm Water
Drainage & Flood Control Master Plan – Pahrump, Nevada

USACE, a much more conservative hydrology than standards set by local agencies. Given that Federal funding may be utilized through the USACE, it is recommended that close coordination with the USACE regarding detention basin hydrologic analysis be implemented.

Recommendation:

- Coordinate detention basin hydrologic criteria with USACE.

6.6 Urban adjustments

Reilly and Piechota (2005) validated the Clark County precipitation factor of 1.43 for the 100-yr, 6-hr storm in urban Las Vegas. Taking into account the increased rainfall depths of NOAA Atlas 14, vs NOAA Atlas II, a precipitation adjustment factor for urban hydrology should not be used for Pahrump. The Pahrump isoplethials increased from 1.80 in NOAA Atlas II to 2.19 in NOAA Atlas 14, or by a factor of 1.22 (1.80-in x 1.22 = 2.19-in). A correction factor of about 1.17 could be applied (2.20-in x 1.17 = 2.57-in; 1.80-in x 1.43 = 2.57-in) to NOAA Atlas 14 isoplethials for the 6-hr, 100-yr storm, and similar correction factors could be developed for other durations. This practice would be consistent with other agencies in the southwest. However, the density of Pahrump Valley development versus that of Las Vegas, the increased rainfall depths for NOAA Atlas 14 should be used with no further increase to rainfall depth.

Recommendation:

- Use NOAA Atlas 14 isoplethials, with no further correction to rainfall depths.

6.7 Update FEMA studies

Update the Pahrump, Nye County FIS and FIRM's as soon as practical. File a CLOMR and LOMR, or FIS Restudy, based on upstream improvements, such as detention basins, once the modifications to the watershed drainage patterns have been identified. This will reduce the burden of carrying mandatory flood insurance on the Pahrump Valley community.

Recommendation:

- Update NFIP products such as the FIS and FIRM's for Pahrump.



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AFFIDAVIT OF HAND DELIVERY

NYE COUNTY ADMINISTRATION – PAHRUMP, NEVADA

COUNTY OF NYE

The undersigned, being duly sworn according to law, deposes and says: That he/she is over the age of 21 years; that he/she hand delivered, to the address below mentioned. That on the 18th day of June 2008, he/she delivered:

5 – copies of Resolution 2008-44, including The Final Report-Pahrump Regional Flood Control District Service Plan

One copy for each member of the Pahrump Town Board



A handwritten signature in cursive script, reading "Julia McCoy", is written over a horizontal line.

ATTN: Pahrump Town Board
400 N. Nevada Highway 160
Pahrump, NV 89060

