CENTRAL NEW MEXICO COMMUNITY COLLEGE
WESTSIDE CAMPUS
DRAINAGE MASTER PLAN

AUGUST 2010

Prepared For

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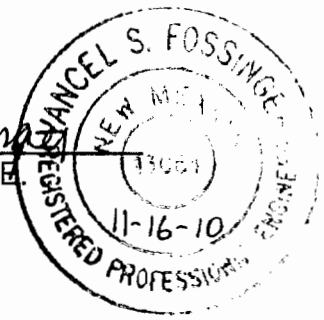
I Vancel S. Fossinger, P.E., do hereby certify that this report was prepared under my direction and review and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.



Vancel S. Fossinger, P.E.
PE No. 13064

ACCEPTED BY:

City of Albuquerque	Date
Bernalillo County	Date
Albuquerque Metropolitan Arroyo Flood Control Authority	Date
Central New Mexico Community College Executive Director	Date

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1 Introduction

The Central New Mexico Community College (CNM) Westside Campus (previously referred to as the Albuquerque Technical Vocational Institute Northwest Site) is located on approximately 101 acres in Ventura Ranch, approximately four miles west of Coors Boulevard. The existing east half of the campus has been developed through Phase II, of a five building, five phase campus master plan completed in 2000, leaving a large portion of the west half of the campus grounds available for development. The campus master plan is currently being revised. The revised master plan will expand campus development from five phases to seven and incorporate the construction of 5 new buildings, 3 additional parking lots, and an onsite looping roadway system.

1.1 Purpose

This purpose of this report is to define general drainage patterns and the primary drainage system infrastructure required for the future development of the campus. The drainage concepts provided in this master plan will serve as a framework to unify phased development of the future site specific improvements.

After approval, this DMP will effectively supersede the existing Albuquerque TVI Master Drainage Plan North West Site", revised December 2001, by Larkin Group NM, Inc. (henceforth referred to as the TVI MDP) in regards to future campus development.

Specific details regarding the interim phasing relationships between the buildings, roadways, and parking structures is not currently known. Thus, this document only provides concept level planning required for the ultimate or full build out condition.

1.2 Existing Reports and Plans

The following previous reports and plans were used to help aid in hydrologic and hydraulic analyses.

"Albuquerque TVI Master Drainage Plan North West Site", revised December 2001, by Larkin Group NM, Inc.

"Albuquerque TVI Northwest Site Offsite Improvements Drainage Report", dated May 2002, by Larkin Group NM, Inc.

"Albuquerque TVI West Side Instructional Facility Phase I – Grading and Phase I - Drainage Plan, Calculations, Sections and Details", stamped 03-06-2002, by Custer Basarich, LTD.

"Calabacillas Arroyo Prudent line Study and Related Work Development of a Prudent Line for the West Branch Albuquerque, New Mexico", dated December 1999, by Mussetter Engineering, Inc.

"CNM Westside Campus Phase III Academic Building_Programming Document", draft dated 08-02-2010, by Design Plus, Gould Evans, Bridgers and Paxton and Wilson and Company and RME.

"Central New Mexico Community College North Access Drive Drainage Report/Technical Memorandum", draft dated July 2010, by URS Corporation.

"Drainage Report for Albuquerque Technical Vocational Institute North West Side Phase II", dated November 2005, by Bohannan Huston

"Grading and Drainage Plan for Phase I, stamped 11-24-2003, by Jeff Mortenson and Associates Inc.

"McMahon Boulevard Extension Final Drainage Report", draft Revision 2, dated April 2010, by URS Corporation.

Guidelines and restrictions from the above reports were incorporated into the current Drainage Master Plan.

1.3 Site Location

The Central New Mexico Community College Westside Campus site lies within a 101 acre parcel in Ventana Ranch, in a small portion of Bernalillo County that lies between the City of Rio Rancho and the City of Albuquerque (see Figure 1, Vicinity Map, on page 3). The site is bounded: on the north by future McMahon Boulevard and a 3.5± acre undeveloped parcel currently planned for commercial development, on the west by future Rainbow Boulevard, on the south by the West Branch of the Calabacillas Arroyo, and on the east by a portion of existing and future Universe Boulevard. The physical address of the Central New Mexico Community College, Westside Campus is 10549 Universe Boulevard and it is shown in A-9-Z & A-10-Z on the Albuquerque Zone Atlas Map.

A portion of the existing site is located within flood hazard Zone 'A' as shown on FEMA Flood Insurance Rate Map (F.I.R.M.) Map Number 35001C0103G, revised September 26 2008. This floodplain is associated with the West Branch of the Calabacillas Arroyo. A prudent line study was performed on this portion of the arroyo in 1999. As a result of that study, a prudent line was established and a drainage easement has been granted to AMAFCA for the lands included within the prudent line. The FEMA designated floodplain lies completely within the defined prudent line easement area. A copy of the F.I.R.M. map and recorded easement are included within Appendix A and F of this report.

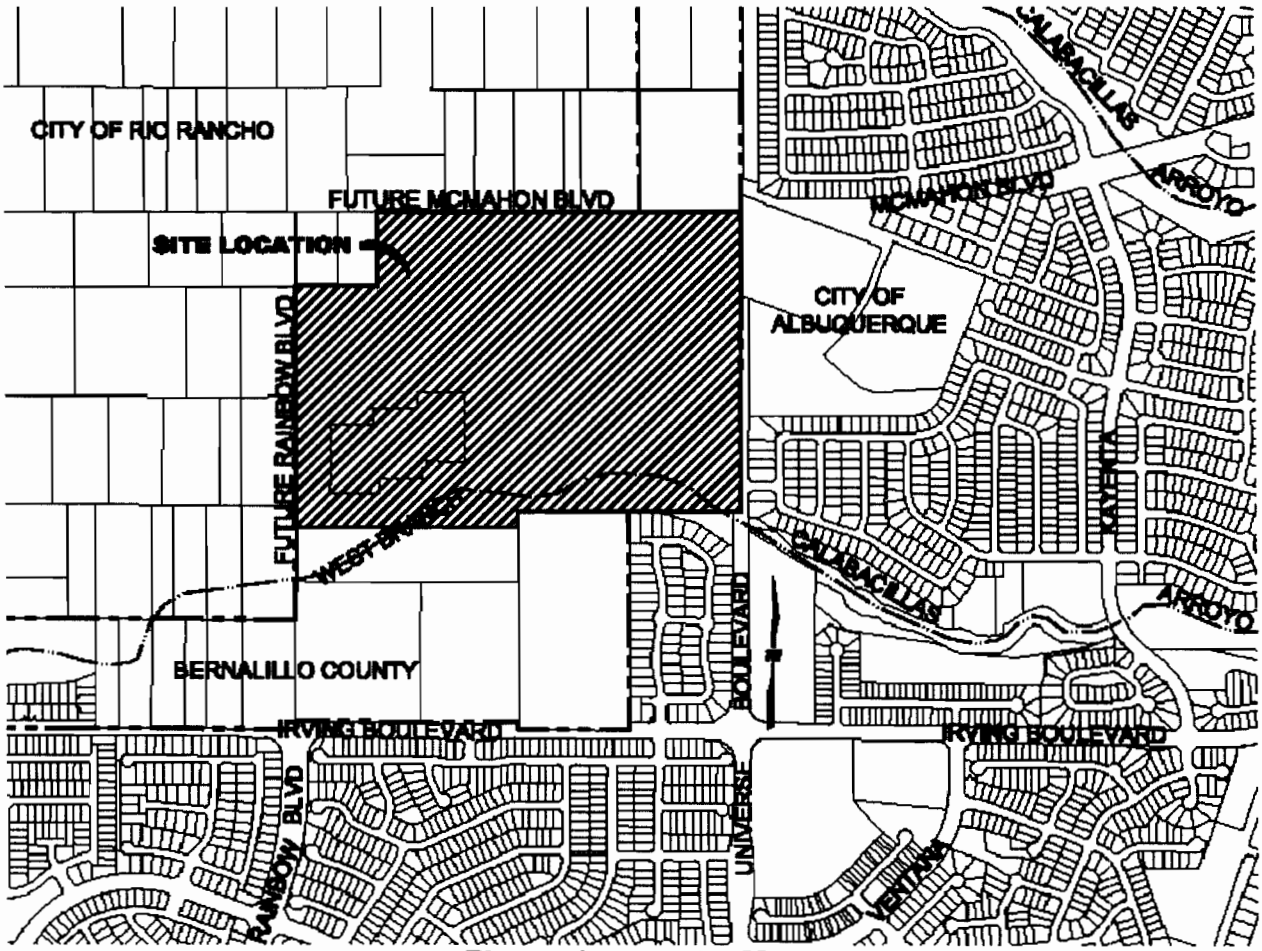

Figure 1: Vicinity Map

1.4 Planning History

The following is a summary of documents and planning history related to the CNM site. (Refer Appendix F for supporting documentation).

- The "TVI North West Site Master Plan", by DWL, Architects & Planners, 2000 defined the original campus layout and concept drainage plan (at the time of this report this document was not available for review)

- The "Draft Prudent Line Study was performed on the West Branch of the Calabacillas by Mussetter Engineering Inc", for AMAFCA in 1999. The study: defined a prudent line, a 100 year floodplain based on bulked flow and forecasted 2036 development, and an equilibrium slope for the channel.

- The "TVI North West Drainage Master Plan North West Site", by Larkin Group NM Inc, in 2001, established drainage patterns for each phase of campus development. It also proposed that in the ultimate condition, runoff from offsite

watersheds would be collected and conveyed around the site in bordering public streets. Runoff from offsite basins reaching the west boundary and northwest corner of the campus would be directed south down Future Rainbow Boulevard, in a 78" storm sewer while flows reaching the remainder of the north boundary of campus would be directed east through McMahon then south through Universe by way of 54 to 66" storm sewers. The report indicated free discharge from the campus to the West Branch of the Calabacillas, provided that defined the equilibrium slope of the Calabacillas is maintained through the construction of grade control structures. Temporary diversions for the offsite flows were to be constructed to protect improvements in the initial phases prior to the development of upstream phases. The plan also established the need to coordinate with AMAFCA on the placement of required drop structures in West Branch of the Calabacillas as development occurs.

- The "TVI North West Site Offsite Improvement Drainage Report", by Larkin Group NM Inc, in 2002 indentified drainage improvements necessary for the extension of Irving and Universe Boulevards to provide access to the site. The report defined a crossing structure at intersection of Universe and the West Branch of the Calabacillas Arroyo as well as recommended a 66' storm drain to be constructed from Phase I of the campus to the West Branch of the Calabacillas. The report also provided design information for grade control structures east of Universe Boulevard.

- "Phase I of the TVI Northwest Site Offsite Improvement Plans", by Larkin Group NM, Inc. issued in 2000, provided the design for the construction of a 60" RCP storm sewer system from Phase I development to West Branch of the Calabacillas in the Universe Boulevard R.O.W. A 36" RCP lateral to provide an outlet for the campus eastside desiltation pond as well as a 60" stub to the north was included in the design.

- The "Albuquerque TVI West Side Instruction Facility Phase I Grading and Drainage Plans", by Jeff Mortensen & Associates, Inc., dated 2002, provided the design for the Phase I drainage infrastructure. The plans also provided the design of a stormwater pollution control structure that provided treatment for the onsite runoff prior to discharge from the site. The plans also included a temporary diversion swale around Phase I to an on-site temporary desiltation pond. Collected runoff from the desiltation pond and those exiting the structure, were to be conveyed downstream in the Phase I offsite improvements system to the West Branch of the Calabacillas in accordance with the TVI Master Drainage Plan.

- The Albuquerque Technical Vocations Institute West Side Campus Phase 2 plans dated 2005 by Van H Gilbert Architect and accompanying drainage plan by Bohannon Huston, Inc. (2005) deviated from TVI's master plan with modifications to the site layout. The combination of eliminating the proposed northeast access and the redirection of all onsite and offsite drainage to the desiltation pond deferred the construction of the adjacent public roadways (portion of McMahon and the extension of Universe Boulevards) and accompanying drainage infrastructure. The majority of the offsite runoff reaching the site from the north was diverted eastward around the site to the desiltation pond. The temporary diversion swale around Phase I was realigned and landscaped to become a permanent drainage feature. The construction of Phase II also required the construction of small on-site detention pond (Pond 1) and the expansion of the existing desiltation pond (Pond 2) (see Figure 2 – Site Map, on page 10).

- The "McMahon Boulevard Extension, Final Drainage Report Revision 2", by URS, dated April 2010, provided the following information.

    - The parcel of land north of CNM campus, known as Quail Lake, was annexed into the City of Rio Rancho in 2003. In accordance with Rio Rancho's polices for Land Development in Rio Rancho as revised in 2007, peak discharge rates of runoff from the developed properties will be restricted to the historic 100-year, 6 hour peak discharge rate.

    - Inlet calculations for McMahon Boulevard prepared by Mark Goodwin and Associates for the Saltillo and Anasazi Subdivisions revealed that a proposed high point in McMahon Boulevard was to be created approximately 800' west of intersection with Universe Boulevard. The Goodwin calculations assumed that the campus offsite basin north of McMahon would be directed through the CNM campus.

    - A meeting was conducted between on April 23, 2009, between the CNM Executive Director and the local floodplain managers of the City of Albuquerque, Rio Rancho and Bernalillo County. They agreed that the historic off-site runoff from two basins north of McMahon Boulevard (defined in the URS report as Basins OS-5 and RW-2) would be accepted and conveyed thru the CNM campus site and that future development of CMN Phase 3 is expected to accommodate this historic flow rate.

- Based upon the three findings listed above, URS submitted the "McMahon Boulevard Extension Plan" and the aforementioned drainage report in early 2010. The plans indicate the planned extension of the two west lanes of Universe Boulevard, the intersection McMahon and Universe, and the construction of a small segment of McMahon Boulevard to the east to connect to the existing roadways. Drainage plans indicate that the 60" stub north of the CNM Westside Campus entrance off of Universe will be removed and replaced with 30" RCP which will extend north to a series of inlets located halfway between entrance and the McMahon intersection. A portion of the inlets capacity will be to collect runoff from a 1.6 acre portion of the northeast corner of the CNM Campus. A 24" storm drain stub will be extended from these inlets within the Universe and McMahon right of ways to a point just to the west of Universe. A temporary sedimentation pond is planned to be constructed to collect the runoff from the small offsite watershed located above and to the west of the intersection. Ultimately this system will collect the developed flows from the south half of future McMahon Boulevard from the high point some 800' feet west of Universe. Ultimately developed flows from the north half of McMahon and the contributing small offsite watershed, north of McMahon, will be conveyed within the north half of McMahon to existing downstream improvement located just east of Kayenta Boulevard.

- In recent coordination associated with the development of the revised master plan, the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), Albuquerque Public Schools (APS), and Bernalillo County Public Works Department (BCPWD) have agreed upon the need to incorporate water quality treatment to improve the quality of surface runoff that will be discharged in the West Branch of the Calabacillas, presumably beginning with Phase III improvements.

2 Hydrology

Sub-basins within the watershed currently discharge to West Branch of the Calabacillas. Basin peak flows and volumes were computed using AHYMO. The CNM Campus is located within Precipitation Zone 1 as defined in Section 22.2 of the DPM.

2.1 Methodology

The AHYMO Computer Program follows the procedures outlined in Chapter 22 of the City of Albuquerque Development Process Manual (DPM), July 1997. The program's input parameters were created by Albuquerque Metropolitan Arroyo and Flood Control Authority (AMAFCA), in conjunction with the City of Albuquerque. The storm events analyzed were the (100-year, 6-hour) and (100-year, 24-hour).

2.2 Design Storm Precipitation

Two design storm events were considered for the design of storm drain and detention ponds. The 100 year, 6 hour event storm was utilized in calculating peak runoff and the 100 year, 24 hour event storm was utilized in determining runoff volumes. In accordance with Section 22.2 of the DPM, Figures C-1, C-2, and C-3 indicated that 100-year precipitation depths for the CNM campus are P60=1.90", P360=2.26", and P1440=2.75".

2.3 Land Treatments

Four land treatments are defined by the DPM. Table A-4 of Section 22.2 of the DPM describes land conditions for each treatment. The following sections describe how the percentages of land treatments were determined for use in the current analysis.

2.3.1 Existing Land Treatment

Existing offsite land treatments were delineated using 2008 aerial photography acquired from the Bernalillo County Website, 2004 LIDAR contour data acquired from AMAFCA, and soil data obtained from the NRCS Soil Web Soil Survey (a copy of the soils map for the contributing watershed is included in the appendix). At the time of this report the offsite contributed watershed area has not been developed.

Existing on-site land treatment was determined using the same data as the offsite with the exception that the evaluation of the terrain was provided by contours developed from a site survey performed by Wilson & Company which replaced the onsite 2004 LIDAR data.

2.3.2 Proposed Land Treatment

The revised Master Plan Campus illustrates the proposed location and approximate sizes of future buildings, parking lots and roadway systems. Specific site planning, grading and landscaping plans have not been developed. Thus the land use percentages of various land treatments outside of the planned hardscaped areas were estimated in accordance with the following sections.

The proposed master plan area was divided in into three distinct zones. The first zone primarily consists of the development areas furthest away from the buildings (excluding basins 319 and 320 which are to be partially dedicated as right of way). These areas on the CNM campus include the sub-basins with parking lots, roadways and minor open spaces that connect the two(i.e. sub-basins 301,-304, 308 and 309). It is anticipated that these areas will receive little to no irrigation and shall have minimal landscaping with the exception of areas immediately adjacent to campus entrances. These exterior "buffer zones" often are used to make up vertical differential around sites resulting in some steep slopes. Landscaped medians within the parking lots are not anticipated to contain turf grass and may be subjected to heavy foot traffic, and thus become compacted. All areas outside of the planned paving in this zone were considered to be land treatment 'C'.

The second zone and third zones include the areas close to and including the proposed buildings on the campus (i.e. Basins 305-307 & 310-313). The close in areas between the proposed buildings was assumed to be 15% B, 45% C and 40% D land treatments. The areas surrounding but not between the proposed buildings were assumed to be 20% B, 50% C and 30% D land treatments.

2.4 Time of Concentration

In accordance with the DPM Chapter 22, equation B-9, the time to peak (t_p) is equal to 2/3 of the time of concentration (t_c). AHYMO computes the t_p and t_c using the Compute LT TP command, which is based on the SCS Upland Method. Flow paths, routing lengths, and slopes utilized as input for the Upland method were determined for the offsite areas using 2004 LIDAR data, while onsite data was acquired from the Wilson & Company site survey. Preliminary site grading was done at a cursory level, during the execution of the master drainage planning to determine slopes that could potentially be utilized in the development of the site.

2.5 Peak Discharge Rate

Peak discharge rates were calculated using AHYMO computer program as outlined in DPM, Chapter 22. Soils report data obtained from the NRCS Soils Web Survey indicated that the primary soils in and around the subject site are classified as loamy fines sand and are highly susceptible to erosion when exposed to concentrated flows. For the purposes of the analysis, a bulking factor of 1.10 (for 10% sediment by volume) was utilized in determining peak discharge rates from contributing undeveloped watersheds. Sediment bulking was not utilized where watersheds were considered fully developed.

3 Hydraulics

3.1 Hydraulic Calculations

Basic hydraulic capacity calculations were performed on the proposed storm sewer system using Flowmaster by Bentley. Additional hydraulic grade line evaluation was performed using the adjusted loss coefficients 'K' calculation per procedures present in FHWA HEC-22. Friction losses were based upon full pipe flow. Refer to Appendix D for calculations.

4 Hydrologic and Hydraulic Analysis

4.1 Existing Site Description

The site can best discussed by dividing the campus into two separate parcel of land; an east and west half (see Figure 2 – Site Map, on page 10). The east half of the CNM site includes approximately 46.4 acres, and contains the completed Phase I and Phase II developments. These two phases have constructed an access roadway, two large buildings, one informal and four formal parking lots, a series of pedestrian access trails, and sidewalks with landscaping. Onsite drainage improvements (refer to Onsite Existing Conditions Map in Appendix E) include several inlets or catch basins, an underground storm sewer system, a large swale which bisects Phase I and II, a small detention pond (Pond 1) on the west side of the Phase II entrance and a desilting pond (Pond 2) located near the east entrance to the site off of Universe.

The southern portion of the east half of the site is bisected by the West Branch of the Calabacillas Arroyo which flows west to east along the south edge of the site. As previously mentioned, a prudent line study was conducted on this portion of the West Branch of the Calabacillas Arroyo. As a result, much of the undeveloped area remaining south of the Phase I improvements was determined to be in an area in which development would not be prudent and has been dedicated as a drainage easement to AMAFCA. Thus this portion of the east half of the site remains undeveloped and will likely not be altered with the exception of the construction of future drop structures within the West Branch of the Calabacillas Arroyo.

The west side or remaining 54.6 acres of the CNM site remains primarily undeveloped with the exception of a series of athletic fields along the southwest corner of the site of which CNM has transferred ownership to the Albuquerque Public Schools (APS) for joint use with the City of Albuquerque. A natural unnamed arroyo which has developed to convey offsite runoff bisects the remaining west half of the site. This unnamed arroyo flows northwest to southeast and outfalls to the West Branch of the Calabacillas Arroyo at the just to the west of the Phase I development. Similar to the east half, much of the area south of the soccer fields adjacent to the channel remains undeveloped as it falls within the dedicated easement for the arroyo.

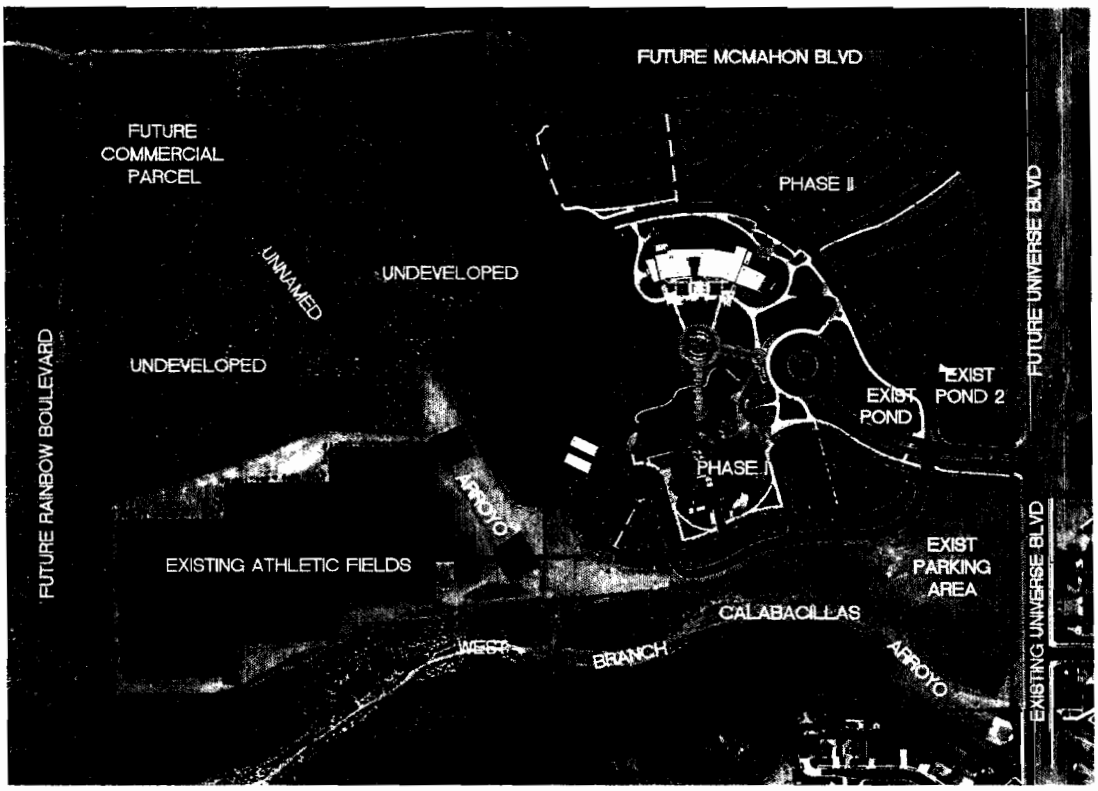

Figure 2: Site Map

Currently access to the site is limited to a single entrance that has been constructed off of Universe Boulevard.

4.2 Existing Conditions Analysis

In accordance with the project scope, existing on-site and off-site drainage patterns have been analyzed for peak flow and runoff volume. With the exception of runoff from proposed development that will be directed towards existing Phase I and Phase II infrastructure, much of the existing on-site analysis is provided for information purposes only as in accordance with the previous Drainage Master Plan for the campus no detention of runoff from the campus is required. It should be noted that review of the past Phase I and Phase II drainage reports have indicated that runoff discharged from those portions of the site are in compliance with the previous master plan. Therefore an analysis of existing Phase I and II in its entirety has not been conducted.

4.2.1 Existing Conditions Offsite Analysis

Runoff reaching the CNM site develops within an offsite watershed located north and west of the campus (refer to Existing Offsite Conditions Map in appendix E). This watershed lies between the Main and West Branches of the Calabacillas Arroyo and is currently undeveloped. Much of this land is covered with natural grass and bushes and possesses slopes that range from 0% to 10% but typically average 2% along water courses. Soils in the watershed have been indentified in the NRCS Soil Data Survey as

BluePoint and Madurez Loamy Fine Sands, and are categorized under Hydrologic Soils Groups "A" and "B" respectively (see soils map in appendix).

This current analysis has determined that approximately 313 acres of offsite watershed contribute to the CNM Campus. Approximately 272.5 acres impact the west and northwest corner of the site and approximately 40.5 acres of offsite area impact the northern boundary of the site. It should be noted that this total acreage is significantly higher than indentified in the previous TVI master plan (156.7 acres, 33.8 acres respectively).

The primary difference in the contributing watershed areas between the previous and current master plan analysis is the size of total watershed defined to reach the northwest corner of the site at the unnamed arroyo. At that location, approximately 263.7 acres reach the northwest corner of the site in the revised plan, as compared to 115.6 acres as indentified by the TVI Master Plan. The differences between the studies are likely due to the accuracy of the topographic mapping. It appears that the USGS Quad sheet mapping was used for the previous study and it lacked details shown by the current LIDAR based mapping.

Although some minor changes are noted in the accounting of the runoff contribution from the offsite watershed located north of the subject site, these discrepancies are primarily centered on the adjustment of the north property line with the dedication of right of way for future McMahon Boulevard, and minor small changes in the exterior basin definition with the recent LIDAR mapping.

The offsite watershed was divided into 12 sub-basins and whenever possible the basins identifiers were chosen to match those utilized in previous reports to allow for direct quantitative comparisons. The following table summarizes the assumptions for land use, watershed areas, peak flow rates, and runoff volumes associated with the offsite sub-basins.

Table 1: Existing Offsite Sub-basin Peak Discharge and Volumes

Sub-Basin	Area (Ac)	Land Treatment Percentage (%)				Q_{100}	V_{100} (ac-ft)
		A	B	C	D		
OS-1	31.67	100	0	0	0	32.4	1.35
OS-2A	53.18	100	0	0	0	40.4	2.27
OS-2B	19.13	100	0	0	0	28.9	0.82
OS-2C	16.07	100	0	0	0	20.1	0.69
OS-2D	23.09	100	0	0	0	28.5	0.99
OS-2E	66.64	100	0	0	0	60.7	2.85
OS-3	85.57	100	0	0	0	79.3	3.65
OS-4	7.41	100	0	0	0	10.0	0.32

OS-5	3.62	100	0	0	0	1.8	0.05
RW-2A	3.66	100	0	0	0	5.5	0.16
RW-2B	1.52	100	0	0	0	2.3	0.07
OS-A*	202.42	100	0	0	0	170.7	8.64

*BASIN OS-A DOES NOT REACH THE SITE BUT CAN BE UTILIZED FUTURE SIZING OF RAINBOW STORM SEWER

The routing of the runoff from individual sub-basins to Design Points around the exterior of the site was performed for the purpose of onsite analysis and discussion purposes. Design Points 1 & 2 which are located away from the project site (refer to Offsite Existing Conditions Map in Appendix E) do not have significant use for the purposes of this analysis but were beneficial for accounting purposes within the model. The following table summarizes the contributing watershed areas, peak flow rates, and runoff volumes at the Design Points.

Table 2: Existing Offsite Design Point Peak Discharge and Volumes

Design Point	Area (ac)	Q_{100} (cfs)	V_{100} (ac-ft)
DP-E1	111.48	87.8	4.71
DP-E2	178.12	110.4	7.56
DP-E3	263.69	126.3	11.21
DP-E4	35.33	36.9	1.50

As illustrated above, the 100 year, 6 hour peak discharge reaching the northwest corner of the CNM site at Design Point 3 is approximately 126.3 cfs as compared to 97.6 cfs per the TVI MDP (Direct addition of TVI MDP Basins OS-2b, and OS-3, refer to TVI map in appendixes). Thus despite an approximate 148.1 acres of additional watershed expected to reach this point, an increase of only 28.7 cfs occurs at the peak in the existing condition. Flat slopes and long flow paths cause a significant separation in the alignment of the sub-basin hydrographs. Future consideration to upstream development and discharge to this location should be considered as increases in runoff and shortened lag times will substantially impact the size of future infrastructure required in Rainbow Boulevard. Per the TVI MDP the infrastructure in Rainbow Boulevard was to convey the full 100 year peak developed flows from the contributing watershed.

A comparison of the peak runoff rates reaching the northern boundary is more akin between the two studies as watershed areas sizes are similar. The current study indicates a 100 year peak rate of approximately 40.5 cfs combined (Direct addition of DP-E4, RW2b, and OS-5) versus the 39 cfs (TVI Basins OS-1 and OS-5).

4.2.2 Existing Conditions Onsite Analysis

A copy of the Existing Onsite Conditions Map is included in Appendix E.

Undeveloped portions of the site remain primarily in a natural state and are covered with natural grass and bushes. Slopes in these areas range from less than 0.5% to as great as 4:1 in areas adjacent to the unnamed arroyo but typically are in the 2 to 5% range. On-site soils have been identified in NRCS Soil Data Survey as BluePoint Loamy Fine Sands, and are categorized under Hydrologic Soils Groups "A" (see soils map in Appendix B). The following table summarizes the assumptions for land use, watershed area, peak flow rates, and runoff volumes for the sub-basins associated with the onsite analysis.

Table 3: Existing Onsite Sub-basin Peak Discharge and Volumes

Sub-Basin	Area (Ac)	Land Treatment Percentage (%)				Q_{100}	V_{100} (ac-ft)
		A	B	C	D		
101	19.59	51	35	14	0	37.0	1.08
102	17.27	69	10	20	1	30.6	0.94
103	0.68	0	0	100	0	2.2	0.06
104	13.64	76	0	23	1	21.3	0.73
105	2.92	0	13	26	62	11.0	0.46
106	1.95	0	24	48	28	6.2	0.22
107	2.15	60	0	38	2	3.8	0.11
108	1.17	0	12	24	64	4.5	0.19

The portions of the campus included in this analysis drain to three primary locations: directly to the West Branch of the Calabacillas, to the West Branch of the Calabacillas via the unnamed arroyo, and to a temporary drainage swale that conveys runoff between Phases I and II to the existing Ponds 1 and 2. These outfalls areas are identified as Design Points E5-E7 on the on-site existing conditions map. The following table summarizes the contributing watershed areas, peak flow rates, and runoff volumes at these Design Points.

Table 4: Existing Onsite Design Point Peak Discharge and Volumes

Design Point	Area (ac)	Q_{100} (cfs)	V_{100} (ac-ft)
DP-E5	15.16	21.3	0.79
DP-E6	27.00	37.8	1.40
DP-E7	280.96	130.4	12.13

4.3 Proposed Site Description

The revised CMN site master plan will expand the campus development to seven phases. At the time of the analysis, specifics regarding the elements of the proposed

plan are limited. A map illustrating the revised master plan site layout (without drainage infrastructure) is provided below.

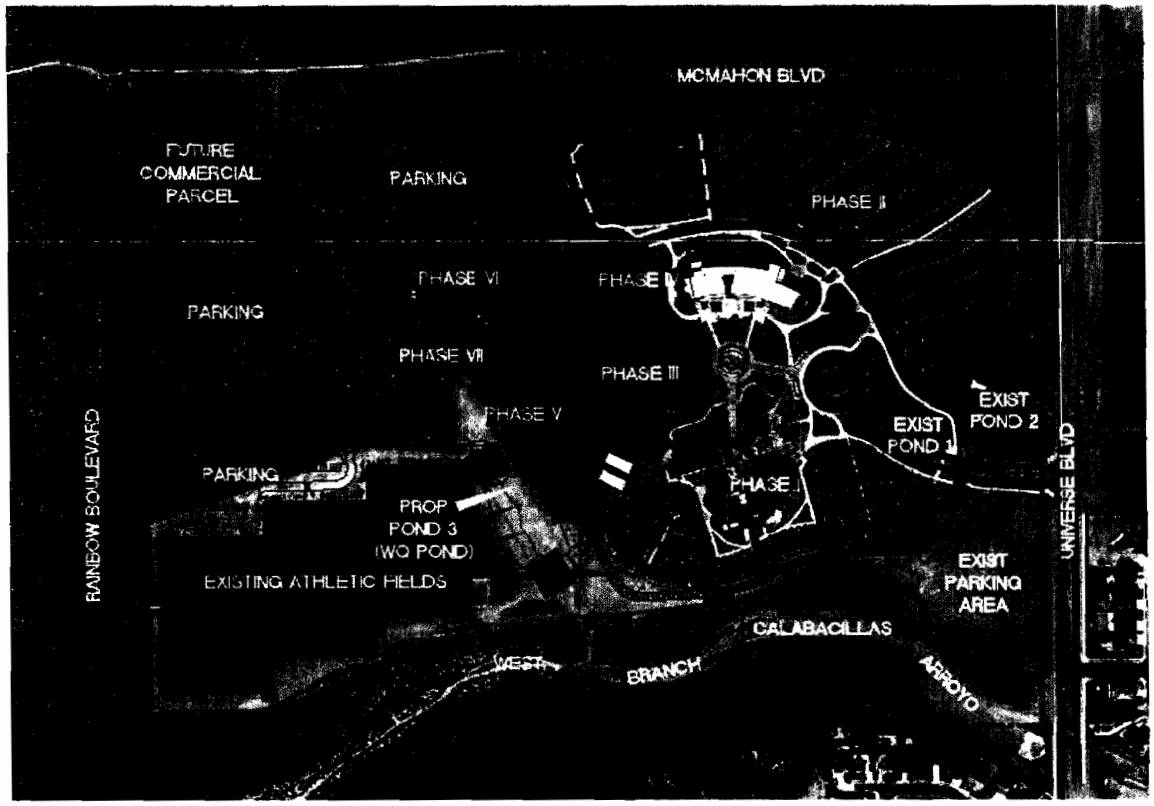

Figure 3: Proposed Site Map

4.4 Proposed Conditions Analysis

Runoff from offsite areas, previously directed to the west boundary (Basins OS-4 and OS-4A) and the unnamed arroyo at the northwest corner of the site (OS2A-OS2E, & OS-3 (minus the N.W. commercial tract)) will now combine with runoff from onsite Basins 319 and 320. Consistent with the previous TVI Master Drainage Plan, the combined runoff will be collected and conveyed in a future storm sewer system in the Rainbow Boulevard corridor and directed to the West Branch of the Calabacillas (refer to Onsite Final Conditions Map in Appendix E). Since the offsite contributing watersheds fall within the City of Rio Rancho, it is anticipated that the discharge of runoff to the storm system may be limited to historic rates in accordance with their 2007 land development policy. This varies from the previous master plan and will need to be verified by the local agencies. Topography adjacent to existing high point in McMahon near the commercial site and elevations shown on the proposed crossing structure as illustrated in The Albuquerque TVI Master Drainage Plan Channel Plan and Profiles (see Appendix F for plans) would suggest that roadway grades of 0.5% or greater can be maintained within the corridor. Continued coordination on the development of channel crossing, roadway infrastructure, and onsite grading is imperative to allow for safe overflow routing of the offsite flows through the corridor and away from the campus.

Offsite flows reaching the north boundary of the site from Basins OS-1 and RW-2, at Design Point 4, are to be collected and routed through the site based upon the April 23, 2009 agreement between the CNM campus and local floodplain managers. Although CNM is only required to collect historic runoff from these two basins, conveyance has been expanded to account for developed flows from the future McMahon Boulevard (Basin RW-2) as separation of the existing versus developed runoff from this basin would prove to be difficult. Until the development of the Quail Ranch area, temporary diversions will be needed to direct the offsite runoff to a collection point that corresponds with the onsite proposed improvements. Further coordination with the adjacent development during the design of McMahon Boulevard is expected.

The remaining offsite flows reaching the northeast corner of the site from Basin OS-5 (refer to Existing Conditions Offsite Map) and the north half of McMahon, east of the high point will be conveyed east within the roadway to downstream infrastructure in accordance with the McMahon Boulevard Extension Final Drainage Report. Flows in the south half of the roadway as well as portion of existing CNM Phase II site will also be collected with and conveyed down Universe in accordance with the aforementioned report (these area are not delineated on the final conditions map) through the required 24"/30" storm drain is currently designed and proposed for construction in the Universe Boulevard corridor.

Runoff collected from the offsite Basins OS-1 and RW-2 (DP-4) will combine with the majority of the onsite developed flows from a portion of Phases IV, and Phases V through VII (Basins 301-306, 308-311, & 313-315) as well as the commercial parcel located in the northwest corner of the site (Basin OS-6). Runoff produced within these areas will be collected by proposed inlets and will be conveyed in multiple proposed on-site storm drain systems that will range between 18" to 54" diameter. Collected runoff will be directed a water quality facility (Pond 3) that is to be located between the existing soccer fields and the existing Phase I development. Analysis indicates that approximately 70.9 acres will contribute to the water quality pond of which approximately 52% is anticipated to be impervious. Based upon the DPM criteria a water quality treatment volume of approximately 1.4 ac-ft will be required in the pond. Runoff will be discharged from the pond via a water outlet structure and a 54" storm drain outfall to the West Branch of the Calabacillas Arroyo (calculations regarding the preliminary sizing of the pond facilities are included Appendix D). The pond was conceptually designed with 6:1 side slopes. The outfall location of the storm drain from the proposed Pond 3 is significant for two reasons: it is planned to coincide with the downstream end of a proposed drop structure, where a stilling basin will likely be constructed, and it is at a point where the 100 year water surface elevation in the West Branch of the Calabacillas will not have negative impacts on the hydraulics of the on-site storm sewer systems.

Based on the prudent line study conducted in 1999 by Mussetter Engineering, the 2036, 100 year bulked flow rate within the channel produces a 100 year water surface elevation at the proposed outlet location of approximately 5416.8. This elevation was

determined by interpolating between analyzed cross sections within the study that are adjacent to the proposed outfall location (refer to Onsite Final Conditions Map). This elevation limits the portions of the campus that can be routed to the pond in a cost effective manner. Based on the proposed master plan drainage analysis and concept design, site elevations below 5424.5 will be difficult to drain to the proposed water quality facility. As such, runoff from portions of the proposed campus development that fall below this elevation will likely need to be routed through the existing developed portion of the campus as proposed by this Master Plan.

It should be noted that the prudent line study utilized the energy grade line (EGL) to map the 100 year floodplain. The study indicated that the use of the energy grade line in floodplain mapping was appropriate as the flows in the channel were found to be near critical flow conditions. Review of the HEC-RAS output files provided in the Mussetter study (included in Appendix F) indicates that at the proposed outlet location a vertical difference of approximately 1.85' exists between the 100 year HGL and EGL elevations. Use of the 100 year HGL in the channel as a starting condition for the onsite storm sewer and pond should be considered in the final design.

Further consideration of the location of the pond outfall storm sewer, the hydraulic efficiency of the outlet works, the maximizing the footprint of the proposed water quality pond should be done at the time of final design of the on-site facilities.

Attention should also be given to the distance between the future Phase III and Phase V buildings. Placement of the large storm sewer infrastructure relative to the building foundations should be done in a manner which would minimize risks associated with the potential failure or maintenance needs of the system.

Due to the elevations constraints noted above, Basins 307, 312A, 316B, and 318 have been planned to discharge to existing outfalls within the existing Phase I and Phase II portion of the campus. These sub-basin watersheds include the aforementioned future Phase III and portions of future Phase IV, as well as a small portion of the proposed looped roadway system. Basin 318 is a small 0.61 acre area located to the west of the existing northwest Phase II parking lot which in the existing condition drains to a pair of sump inlets located on the north side of the Phase II building. Based on calculations performed in this analysis, the developed peak 100 year runoff anticipated to contribute to these inlets from this basin is approximately 2.1 cfs, slightly less than the 2.2 cfs calculated in the existing condition (see Existing Onsite Condition Map). This is a result of a slight decrease in the basin size and the anticipation of limited impervious surfaces within this area. Thus runoff from this basin is not likely to have a negative impact on downstream systems above the current condition. Evaluation of the onsite grading within phase II would suggest that should these inlets or the attached storm sewer systems become clogged runoff from this area will overtop a localized highpoint east of the inlets and continue through the parking lot to existing Pond 2.

Basin 307 includes a portion of Phase III building, Phase IV building, and future hardscaping and landscaping improvements around the buildings. The 100 year peak

rate of runoff of 7.14 cfs from this area is to be conveyed to the existing Phase I/II swale before ultimately discharging into existing Ponds 1 and 2. This flow rate is less than the 100 year peak flow rate of 21 cfs that occurs in the existing condition (see Design Point E5 – Existing Onsite Conditions Map) and less than the 29 cfs planned for in the Phase II drainage report. Thus no negative impacts to the existing downstream systems are anticipated with the development of this portion of the campus.

Basin 316B is a small portion of the future looped roadway system. Due to grading constraints it is not practical to route runoff from this basin through the proposed water quality facility (Pond 3). Runoff from this basin will combine with runoff from a portion of the existing Phase 1 building access roadway. Combined flows are directed to and existing inlet located south of the main campus entrance. Per the Phase I drainage plan 100 year peak rates anticipated to the reach the inlet are 4.0 cfs, with available inlet capacity of 6.0 cfs at 6" of flow depth. Per the current analysis, the additional area will increase the runoff anticipated to reach the inlet to approximately 5.5 cfs. Thus, no negative impacts to the existing downstream systems are anticipated with the development of this portion of the campus. Evaluation of the onsite grading within Phase I would suggest that should this inlet become clogged, runoff from this area will be routed northward to a series of sump inlets just east of the main entrance, with overflow routing ultimately reaching Universe Boulevard. The development of Basin 316, will slightly reduce the size of the existing watershed directed to an inlet within Basin 316A.

Runoff from Phase III (Basin 312A) can most efficiently be directed to an existing pipe system/catch basin or inlet within the existing Phase I development. Drainage infrastructure in Basin 312A proposes to tie into an existing inlet built under Phase I. Phase I Grading Plan lists the Q_{100} and capacity for each pipe segment. The pipe capacity just downstream of the proposed tie-in is 10.5 cfs which is greater than the proposed 9.3 cfs to be discharged into this pipe. Excess capacities exist in downstream pipe segments and their capacities will not be exceeded by the developed runoff. Therefore, no attenuation is required before discharging into the existing system.

The following table summarizes the assumptions for land use, watershed area, peak flow rates, and runoff volume for the fully developed condition as proposed by the revised site master plan.

Table 5: Proposed Onsite Sub-basin Peak Discharge and Volumes

Sub-Basin	Area (Ac)	Land Treatment Percentage (%)				Q_{100}	V_{100} (ac-ft)
		A	B	C	D		
OS-1	31.67	100	0	0	0	32.4	1.35
RW-2	5.18	0	0	40	60	19.9	0.83
OS-6	3.43	0	4	6	90	14.6	2.35
301	2.14	0	0	65	35	7.5	0.28

302	3.93	0	0	20	80	16.3	0.73
303	1.87	0	0	65	35	7.1	0.29
304	3.10	76	0	45	55	11.7	0.48
305	3.12	0	14	32	54	11.3	0.47
306	3.03	0	14	338	48	10.7	0.43
307	1.95	60	12	34	54	7.1	0.28
308	3.03	0	12	40	60	11.7	0.49
309	2.16	0	12	40	60	7.7	0.29
310	2.2	0	11	29	60	8.3	0.35
311	1.37	0	11	33	56	4.5	0.20
312A	1.37	0	8	24	68	5.35	0.22
312B	1.09	0	15	29	56	4.02	0.16
313	0.63	0	13	33	54	2.3	0.19
314	0.98	0	90	3	7	2.3	0.09
315	2.04	0	55	40	5	5.2	0.15
316A	2.56	0	10	20	70	10.0	0.42
316B	0.42	0	17	41	42	1.5	0.6
317	17.98	26	49	20	5	28.3	1.16
318	0.61	0	18	43	39	2.1	0.08
319	2.59	0	0	30	70	10.4	0.45
320	1.70	0	0	10	90	7.3	0.34
321	1.17	0	12	24	64	4.5	0.19

The following table summarizes the contributing watershed area, peak flow rates and runoff volume at the Design Points.

Table 6: Proposed Onsite Design Point Peak Discharge and Volumes

Design Point	Area (ac)	Q_{100} (cfs)	V_{100} (ac-ft)
DP-1	5.57	22.1	0.95
DP-2	5.80	23.4	1.01
DP-3	11.37	45.5	1.96
DP-4	36.84	48.5	2.18
DP-5	39.94	59.6	2.66
DP-6	14.49	56.3	2.43
DP-7	57.46	125.7	5.58
DP-8	58.68	130.5	5.60
DP-9	59.32	132.8	6.04

DP-10	5.24	20.0	0.83
DP-11	280.96	27.7	1.12
DP-12	280.96	166.8	7.01
DP-13	2.78	9.37	0.38
DP-14	1.60	5.7	0.25

5 Conclusions

With the development of the proposed site, runoff reaching the west boundary of the site from offsite will be conveyed in the Rainbow Boulevard corridor to the West Branch of the Calabacillas Arroyo in accordance with the previous master drainage plan. Based upon an agreement between the local floodplain agencies and the CNM executive director, a portion of the offsite runoff historically routed through the campus (from along the north boundary) will be collected and conveyed through the site and combined with onsite flows. The remainder of the offsite flows reaching the northeastern portion of the site will be intercepted by a storm sewer system located near the intersection of McMahon and Universe Boulevard as planned and analyzed in the McMahon Boulevard Extension Report by URS.

With future development of the CNM campus, the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), Albuquerque Public Schools (APS), and Bernalillo County Public Works Department (BCPWD) have agreed on the need to incorporate water quality treatment to improve the quality of runoff that will be discharged to the West Branch of the Calabacillas. This Drainage Master Plan accommodates this request by planning for a water quality pond that will provide treatment for the majority of the runoff from future on-site development as well as runoff from the offsite watershed that will be routed through the campus.

Grading and hydraulic constraints will prevent economical routing of the developed runoff from Phase III and portions of Phase IV through the proposed water quality pond. Runoff from these portions of the CNM Campus have been planned to be routed to existing collection systems and conveyance within Phase I and II. The water quality pond is proposed to be built under Phase III. Runoff from offsite watersheds reaching Phase II development and future Phase III will need to be diverted around the development and discharged into the water quality pond via channel until the future storm sewer system is constructed with Phase IV.

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APPENDIX A

FEMA FLOOD INSURANCE RATE MAP

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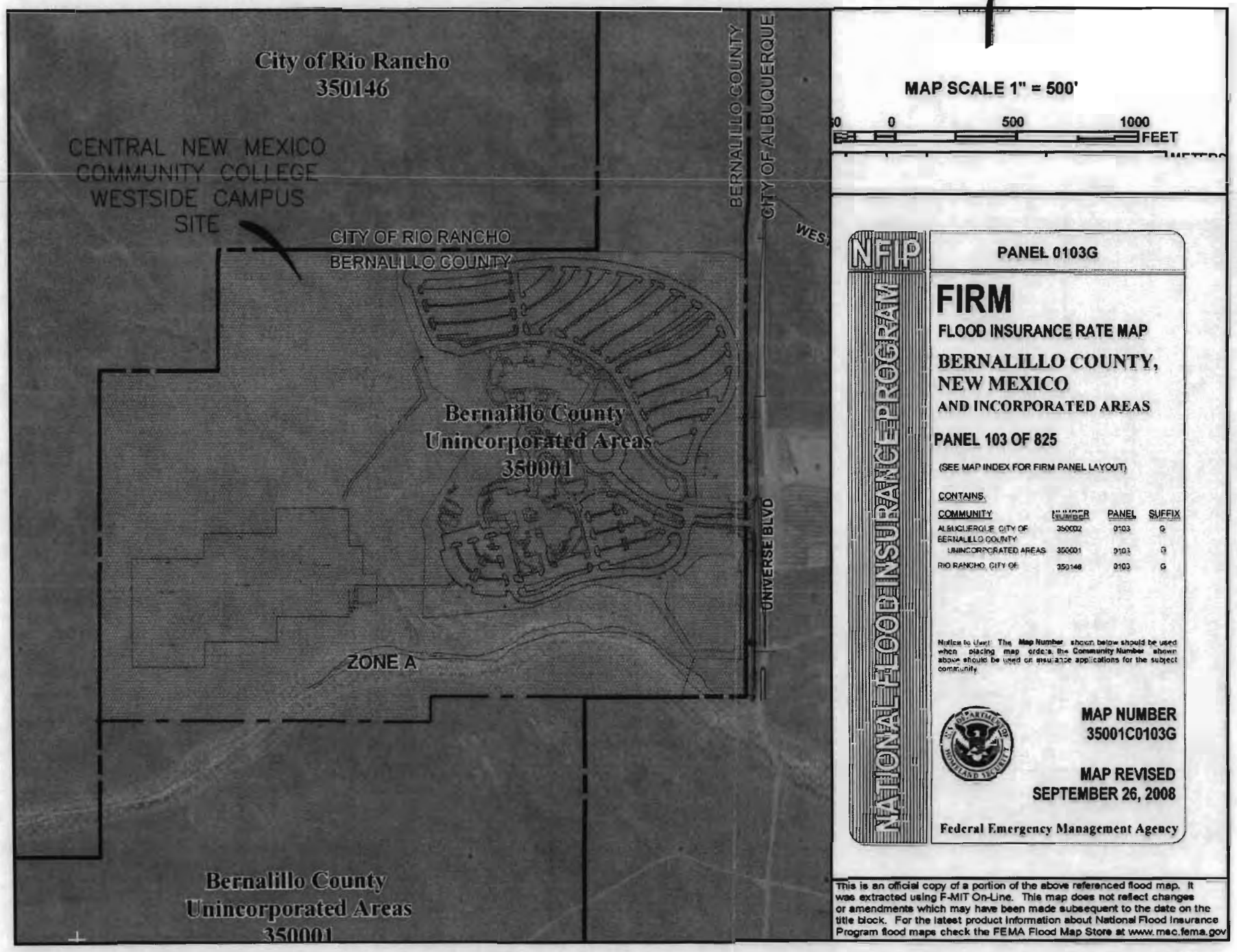

N

MAP SCALE 1" = 500'

0 500 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0103G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 103 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0103	G
BERNALILLO COUNTY, UNINCORPORATED AREAS	350001	0103	G
RIO RANCHO, CITY OF	350146	0103	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0103G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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CONSTRUCTION

PROJECT NAME

CENTRAL NEW MEXICO
COMMUNITY COLLEGE
WESTSIDE CAMPUS
BERNALILLO COUNTY, NM

MARK	DATE	DESCRIPTION

PROJECT NO:
DESIGNED BY: DLM
DRAWN BY: DLM
CHECKED BY: VSF
DATE:

SHEET TITLE

DRAINAGE
MASTER PLAN
FEMA FIRM MAP

SHEET NO:

FLD MAP

1 of 1

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Community College

APPENDIX B

NRCS SOILS DATA MAP

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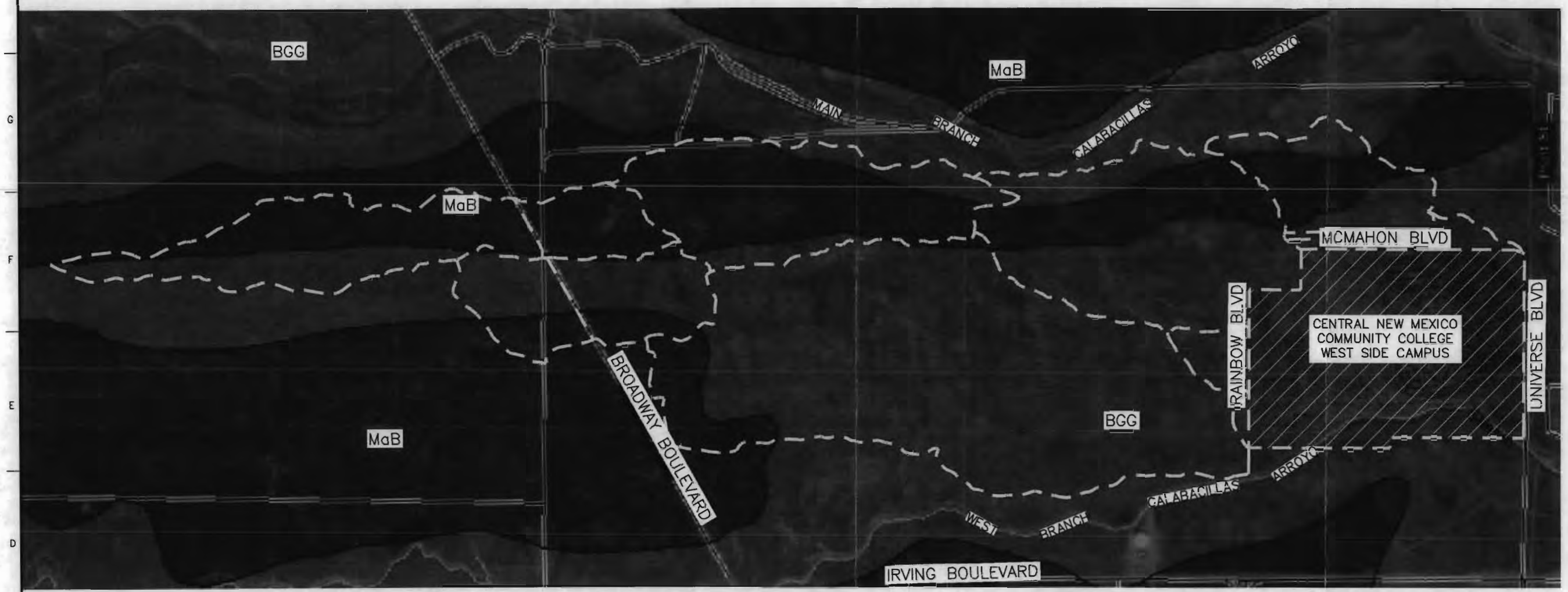

BACKGROUND IMAGE AND SOILS DATA INFORMATION OBTAINED FROM THE NRCS SOIL SURVEY WEBSITE.

MADUREZ LOAMY FINE SAND
HYDROLOGIC SOILS GROUP "A"

BLUEPOINT LOAMY FINE SAND
HYDROLOGIC SOILS GROUP "B"

N

500 250 0 500 1000
SCALE 1" = 1000'

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PROJECT NAME
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COMMUNITY COLLEGE
WESTSIDE CAMPUS
BERNALILLO COUNTY, NM

MARK	DATE	DESCRIPTION

PROJECT NO:	
DESIGNED BY:	DLM
DRAWN BY:	DLM
CHECKED BY:	VSF
DATE:	

SHEET TITLE
DRAINAGE
MASTER PLAN
SOILS MAP

SHEET NO:
SOILS
1 of 1

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APPENDIX C

HYDROLOGIC ANALYSIS

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```
* CENTRAL NEW MEXICO COMMUNITY COLLEGE
* MASTER DRAINAGE PLAN
* EXISTING CONDITIONS MODEL
* 100 YR 6 HR STORM EVENT
* DATE: August 2010
*

*S**************************************************************************
*S
*S       100 YEAR 6 HOUR STORM   EXISTING RUNOFF ANALYSIS
*S       RAINFALL DATA FROM DPM Chapter 22   ZONE 1
*S
*S**************************************************************************

START            0.0 HOURS
RAINFALL         TYPE=1  RAIN QUARTER=0.0 IN
                 RAIN ONE=1.90 IN RAIN SIX=2.26 IN
                 RAIN DAY=2.75 IN         DT=0.03333 HR

**** SEDIMENT BULK FACTOR
SEDIMENT BULK    CODE=1  BULK FACTOR=1.10
**************************************************************************
*
**************************************************************************
*        COMPUTE HYD FOR OFFSITE SUB BASIN 1 (OS1)
**************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=3     ISLOPE=0
                 LENGTH=400       SLOPE=0.016      K=.7
                 LENGTH=1600      SLOPE=0.015      K=2.0
                 LENGTH=95        SLOPE=0.037      K=3.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=1     HYD NO=OS 1      DA=0.04948 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.0  MASS RAIN= 1

PRINT HYD        ID=1     CODE=1

**** ROUTE OS 1 THRU RW 2 TO GET OS 1Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.015  FP SLP=0.015  N=0.035
                     DIST=50 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     5       20     0       30     0      50     5

ROUTE MCUNGE         ID=2  HYD NO=OS 1Rt  INFLOW ID=1
                     DT=0.0 HR  LEN=160 FT
                     NS=0  SLP=0.02

PRINT HYD        ID=2     CODE=5

**************************************************************************
*        COMPUTE HYD FOR OFFSITE SUB BASIN RW 2A
**************************************************************************
*
*ONLY INCLUDES PORTION OF BASIN DIRECTED EAST TO EXISTING PHASE II
*
COMPUTE NM HYD   ID=3     HYD NO=RW 2A     DA=0.00572 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=3     CODE=1


***** ADD OS 1Rt TO BASIN RW 2 TO GET BASIN DP E4
ADD HYD              ID=4  HYD NO=DP E4  INFLOW IDS= 2 AND 3
PRINT HYD            ID=4   CODE=5

**************************************************************************
*        COMPUTE HYD FOR OFFSITE SUB BASIN RW 2B
**************************************************************************
*
*ONLY INCLUDES PORTION OF BASIN RW2 DIRECTED WEST TO FUTURE PHASES
*
COMPUTE NM HYD   ID=38    HYD NO=RW 2B     DA=0.00237 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=38    CODE=1
```

```
**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2A (OS2A)
**************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3     ISLOPE=0
                LENGTH=300       SLOPE=0.023      K=.7
                LENGTH=1700      SLOPE=0.018      K=2.0
                LENGTH=2855      SLOPE=0.014      K=3.0
                KN=0.033         CENTROID DISTANCE = 2420

COMPUTE NM HYD  ID=5     HYD NO=OS 2A     DA=0.08310 SQ MI
                PER A=100    PER B=0    PER C=0    PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=5     CODE=1

**** ROUTE OS 2A THRU OS 2C TO GET OS 2ARt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                    MIN ELEV=0 FT  MAX ELEV=5 FT
                    CH SLP=0.015  FP SLP=0.015  N=0.035
                    DIST=50 FT
                    DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                       0     5      20     0       30     0      50     5

ROUTE MCUNGE        ID=6  HYD NO=OS 2ARt  INFLOW ID=5
                    DT=0.0 HR  LEN=1600 FT
                    NS=0  SLP=0.015

PRINT HYD       ID=6     CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2B (OS2B)
**************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=300       SLOPE=0.037      K=.7
                LENGTH=1200      SLOPE=0.021      K=2.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=7     HYD NO=OS 2B     DA=0.02989 SQ MI
                PER A=100    PER B=0    PER C=0    PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=7     CODE=1


**** ROUTE OS 2B THRU OS 2D TO GET OS 2BRt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                    MIN ELEV=0 FT  MAX ELEV=5 FT
                    CH SLP=0.008  FP SLP=0.008  N=0.035
                    DIST=50 FT
                    DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                       0     5      20     0       30     0      50     5

ROUTE MCUNGE        ID=8  HYD NO=OS 2BRt  INFLOW ID=7
                    DT=0.0 HR  LEN=1600 FT
                    NS=0  SLP=0.008

PRINT HYD       ID=8     CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2C (OS2C)
**************************************************************************
*
*

COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=350       SLOPE=0.014      K=.7
                LENGTH=1230      SLOPE=0.017      K=2.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=9     HYD NO=OS 2C     DA=0.02511 SQ MI
                PER A=100    PER B=0    PER C=0    PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=9     CODE=1

***** ADD OS 2C TO OS 2ARt TO GET DP E1C
ADD HYD             ID=10  HYD NO=DP E1C  INFLOW IDS= 6 AND 9
PRINT HYD           ID=10   CODE=5
```

```
**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2D (OS2D)
**************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=300       SLOPE=0.043      K=.7
                 LENGTH=1485      SLOPE=0.009      K=2.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=11    HYD NO=OS 2D     DA=0.03608 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.0   MASS RAIN= 1

PRINT HYD        ID=11    CODE=1

***** ADD OS 2D TO OS 2BRt TO GET DP E1D
ADD HYD               ID=12  HYD NO=DP E1D  INFLOW IDS= 8 AND 11
PRINT HYD             ID=12   CODE=5

***** ADD BASIN DP E1C TO BASIN DP E1D TO GET DP E1
ADD HYD               ID=13  HYD NO=DP E1  INFLOW IDS= 10 AND 12
PRINT HYD             ID=13   CODE=5

**** ROUTE DP E1 THRU OS 2E TO GET DP E1Rt
COMPUTE RATING CURVE C1D=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.019  FP SLP=0.019  N=0.035
                     DIST=55 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     5       20     0       35     0      55     5

ROUTE MCUNGE         ID=14  HYD NO=DP E1Rt  INFLOW ID=13
                     DT=0.0 HR  LEN=3290 FT
                     NS=0  SLP=0.019

PRINT HYD        ID=14    CODE=1

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2E (OS2E)
**************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=3     IS_OPE=0
                 LENGTH=400       SLOPE=0.043      K=.7
                 LENGTH=1600      SLOPE=0.019      K=2.0
                 LENGTH=1850      SLOPE=0.019      K=3.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=15    HYD NO=OS 2E     DA=0.10413 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.0   MASS RAIN= 1

PRINT HYD        ID=15    CODE=1

***** ADD OS 2E TO DP E1Rt TO GET DP E2
ADD HYD               ID=16 HYD NO=DP E2  INFLOW IDS= 14 AND 15
PRINT HYD             ID=16   CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 3 (OS3)
**************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=3     ISLOPE=0
                 LENGTH=400       SLOPE=0.043      K=.7
                 LENGTH=1600      SLOPE=0.019      K=2.0
                 LENGTH=1850      SLOPE=0.019      K=3.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=17    HYD NO=OS 3      DA=0.13370 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.0   MASS RAIN= 1

PRINT HYD        ID=17    CODE=1

**** ROUTE DP E2 THRU OS 3 TO GET DP E2Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.025  FP SLP=0.025  N=0.035
                     DIST=55 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     5       20     0       35     0      55     5
```

```
ROUTE MCUNGE          ID=18  HYD NO=DP E2Rt  INFLOW ID=16
                      DT=0.0 HR  LEN=2275 FT
                      NS=0  SLP=0.025

***** ADD OS 3 TO DP E2Rt TO GET BASIN DP E3
ADD HYD               ID=19 HYD NO=DP E3  INFLOW IDS= 17 AND 18
PRINT HYD             ID=19   CODE=5

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 4 (OS4)
**********************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=300       SLOPE=0.025      K=.7
                LENGTH=1600      SLOPE=0.021      K=2.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=20   HYD NO=OS 4      DA=0.01158 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=20   CODE=1


**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 4A (OS 4A)
**********************************************************************
*
COMPUTE NM HYD  ID=21   HYD NO=OS 4A     DA=0.00221 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.1333  MASS RAIN= 1

PRINT HYD       ID=21   CODE=1

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 5 (OS5)
**********************************************************************
*
COMPUTE NM HYD  ID=22   HYD NO=OS 5      DA=0.00188 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.1333  MASS RAIN= 1

PRINT HYD       ID=22   CODE=1

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN A (OSA) (DOES NOT CONTRIBUTE)
**********************************************************************
*
COMPUTE LT TP   LCODE=1 NK=3     ISLOPE=0
                LENGTH=400       SLOPE=0.018      K=.7
                LENGTH=1600      SLOPE=0.019      K=2.0
                LENGTH=4175      SLOPE=0.023      K=3.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=23   HYD NO=OS A      DA=0.31628 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=23   CODE=1

**** EXISTING ONSITE ANALYSIS
**** EXISTING OFFSITE FLOWS ONSITE
*
**********************************************************************
*
**********************************************************************
*       COMPUTE HYD FOR ON SITE SUB BASIN 101
**********************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=300       SLOPE=0.023      K=.7
                LENGTH=1600      SLOPE=0.026      K=2.0
                KN=0.030         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=24   HYD NO=101       DA=0.03061 SQ MI
                PER A=51   PER B=35   PER C=14   PER D=0
                TP=0.0  MASS RAIN= 1
```

```
PRINT HYD        ID=24   CODE=1

**** ROUTE OS 4 THRU 101 TO GET OS 4Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=3 FT
                     CH SLP=0.025  FP SLP=0.025  N=0.035
                     DIST=48 FT
                     DIST  ELEV    DIST  ELEV    DIST  ELEV   DIST  ELEV
                        0     3      18     0      30     0     48     3

ROUTE MCUNGE         ID=25  HYD NO=OS 4Rt  INFLOW ID=20
                     DT=0.0 HR  LEN=1100 FT
                     NS=0  SLP=0.025

PRINT HYD        ID=25   CODE=5

***** ADD 101 TO OS 4Rt TO GET BASIN DP E6
ADD HYD              ID=26 HYD NO=DP E6  INFLOW IDS= 24 AND 25
PRINT HYD            ID=26   CODE=5

*************************************************************************
*       COMPUTE HYD FOR ON SITE SUB BASIN 102
*************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=300      SLOPE=0.030     K=.7
                LENGTH=1680     SLOPE=0.023     K=2.0
                KN=0.030        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=27   HYD NO=102      DA=0.02698 SQ MI
                PER A=69   PER B=10   PER C=20   PER D=1
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=27   CODE=1

**** ROUTE DP 3 THRU 102 TO GET DP 3Rt
COMPUTE RATING CURVE CID=I  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.019  FP SLP=0.019  N=0.035
                     DIST=48 FT
                     DIST  ELEV    DIST  ELEV    DIST  ELEV   DIST  ELEV
                        0     3      18     0      30     0     48     3

ROUTE MCUNGE         ID=28  HYD NO=OS 3Rt  INFLOW ID=19
                     DT=0.0 HR  LEN=1500 FT
                     NS=0  SLP=0.019

PRINT HYD        ID=28   CODE=5

**** ADD 102 TO DP 3Rt TO GET BASIN DP E7
ADD HYD              ID=29 HYD NO=DP E7  INFLOW IDS= 27 AND 28
PRINT HYD            ID=29   CODE=5


*************************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 103
*************************************************************************
*

COMPUTE NM HYD  ID=30   HYD NO=103      DA=0.00106 SQ MI
                PER A=0   PER B=0   PER C=100   PER D=0
                TP=0.1333  MASS RAIN= 1

PRINT HYD       ID=30   CODE=1


*************************************************************************
*       COMPUTE HYD FOR ON SITE SUB BASIN 104
*************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=300      SLOPE=0.030     K=.7
                LENGTH=1680     SLOPE=0.016     K=2.0
                KN=0.030        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=31   HYD NO=104      DA=0.02131 SQ MI
                PER A=76   PER B=0   PER C=23   PER D=1
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=31   CODE=1
```

```
**** ROUTE RW 2B THRU 104 TO GET RW 2BRt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.015  FP SLP=0.015  N=0.035
                     DIST=48 FT
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                        0     5      20     0      30     0      50     5

ROUTE MCUNGE         ID=32  HYD NO=RW 2BRt  INFLOW ID=38
                     DT=0.0 HR  LEN=1500 FT
                     NS=0  SLP=0.015

PRINT HYD       ID=32   CODE=5

***** ADD 104 TO RW 2BRt TO GET DP E5
ADD HYD              ID=33 HYD NO=DP E5  INFLOW IDS= 31 AND 32
PRINT HYD            ID=33   CODE=5

*******************************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 105
*******************************************************************************
*
**** REMOVE SEDIMENT BULK FACTOR FOR BASINS 105,106,107,108
SEDIMENT BULK   CODE=1  BULK FACTOR=1.00

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=150      SLOPE=0.018     K=.7
                LENGTH=250      SLOPE=0.019     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=34   HYD NO=105      DA=0.00456 SQ MI
                PER A=0   PER B=13  PER C=26   PER D=62
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=34   CODE=1

*******************************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 106
*******************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=250      SLOPE=0.018     K=.7
                LENGTH=250      SLOPE=0.019     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=35   HYD NO=106      DA=0.00304 SQ MI
                PER A=0  PER B=24   PER C=48   PER D=28
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=35   CODE=1

*******************************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 107
*******************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=225      SLOPE=0.036     K=.7
                LENGTH=235      SLOPE=0.038     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=36   HYD NO=107      DA=0.00304 SQ MI
                PER A=60  PER B=0   PER C=38   PER D=2
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=36   CODE=1

*******************************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 108
*******************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=.7
                LENGTH=700      SLOPE=0.011     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=37   HYD NO=108   DA=0.00184 SQ MI
                PER A=0  PER B=12   PER C=24   PER D=64
                TP=0.0  MASS RAIN= 1
```

```
PRINT HYD       ID=37   CODE=1

FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO 97) VERSION: 1997.02c RUN DATE (MON/DAY/YR) =08/25/2010

INPUT FILE = 100YRE6.DAT USER NO. =

AHYMO C 9803c01UNMLIB AH

PAGE = 1

COMMAND NOTATION	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE
*S**********									
*S									
*S	100 YEAR 6 HOUR STORM EXISTING RUNOFF ANALYSIS								
*S	RAINFALL DATA FROM DPM Chapter 22 ZONE 1								
*S									
*S**********									
START									
TIME= .00									
RAINFALL TYPE= 1									
RAIN6= 2.260									
SEDIMENT BULK									
PK BF = 1.10									
COMPUTE NM HYD	OS 1		1	.04948	32.42	1.356	.51384	1.600	1.024
PER IMP= .00									
ROUTE MCUNGE	OS 1Rt	1	2	.04948	32.41	1.356	.51390	1.600	1.024
CCODE = .2									
COMPUTE NM HYD	RW 2A		3	.00572	5.54	.157	.51384	1.533	1.514
PER IMP= .00									
ADD HYD	DP E4	2& 3	4	.05520	36.94	1.513	.51388	1.600	1.046
COMPUTE NM HYD	RW 2B		38	.00237	2.30	.065	.51384	1.533	1.517
PER IMP= .00									
COMPUTE NM HYD	OS 2A		5	.08310	40.41	2.277	.51384	1.667	.760
PER IMP= .00									
ROUTE MCUNGE	OS 2ARt	5	6	.08310	39.97	2.269	.51185	1.833	.752
CCODE = .1									
COMPUTE NM HYD	OS 2B		7	.02989	28.93	.819	.51384	1.533	1.512
PER IMP= .00									
ROUTE MCUNGE	OS 2BRt	7	8	.02989	27.34	.803	.50364	1.700	1.429
CCODE = .1									
COMPUTE NM HYD	OS 2C		9	.02511	20.14	.688	.51384	1.567	1.253
PER IMP= .00									
ADD HYD	DP E1C	6& 9	10	.10821	47.18	2.957	.51231	1.800	.681
COMPUTE NM HYD	OS 2D		11	.03608	26.49	.989	.51384	1.567	1.147
PER IMP= .00									
ADD HYD	DP E1D	8&11	12	.06597	47.38	1.792	.50921	1.667	1.122
ADD HYD	DP E1	10&12	13	.17418	87.80	4.748	.51113	1.733	.788
ROUTE MCUNGE	DP E1Rt	13	14	.17418	86.26	4.730	.50913	2.000	.774
CCODE = .1									
COMPUTE NM HYD	OS 2E		15	.10413	60.66	2.854	.51384	1.633	.910
PER IMP= .00									
ADD HYD	DP E2	14&15	16	.27831	110.39	7.583	.51089	1.966	.620
COMPUTE NM HYD	OS 3		17	.13370	79.26	3.664	.51384	1.633	.926
PER IMP= .00									
ROUTE MCUNGE	DP E2Rt	16	18	.27831	109.08	7.572	.51016	2.133	.612
CCODE = .1									
ADD HYD	DP E3	17&18	19	.41201	126.28	11.236	.51135	2.133	.479
COMPUTE NM HYD	OS 4		20	.01158	10.01	.317	.51384	1.533	1.351
PER IMP= .00									
COMPUTE NM HYD	OS 4A		21	.00221	2.15	.061	.51384	1.533	1.517
PER IMP= .00									
COMPUTE NM HYD	OS 5		22	.00188	1.83	.052	.51384	1.533	1.518
PER IMP= .00									
COMPUTE NM HYD	OS A		23	.31628	171.96	8.668	.51384	1.700	.850
PER IMP= .00									
COMPUTE NM HYD	101.00		24	.03061	36.96	1.085	.66464	1.533	1.887
PER IMP= .00									
ROUTE MCUNGE	OS 4Rt	20	25	.01158	9.95	.316	.51230	1.700	1.342
CCODE = .1									
ADD HYD	DP E6	24&25	26	.04219	37.81	1.401	.62281	1.567	1.400
COMPUTE NM HYD	102.00		27	.02698	30.63	.934	.64889	1.533	1.774
PER IMP= 1.00									
ROUTE MCUNGE	OS 3Rt	19	28	.41201	125.91	11.238	.51142	2.200	.478
CCODE = .2									
ADD HYD	DP E7	27&28	29	.43899	130.36	12.172	.51987	1.800	.464
COMPUTE NM HYD	103.00		30	.00106	2.21	.064	1.13558	1.500	3.264
PER IMP= .00									
COMPUTE NM HYD	104.00		31	.02131	21.33	.726	.63886	1.567	1.564
PER IMP= 1.00									
ROUTE MCUNGE	RW 2BRt	38	32	.00237	2.19	.064	.50506	1.933	1.445
CCODE = .1									
ADD HYD	DP E5	31&32	33	.02368	21.33	.790	.62543	1.567	1.407
SEDIMENT BULK									

PK BF = 1.00								
COMPUTE NM HYD	105.00	34	.00456	10.97	.387	1.59223	1.500	3.759
PER IMP= 61.39								
COMPUTE NM HYD	106.00	35	.00304	6.16	.198	1.21929	1.500	3.165
PER IMP= 28.00								
COMPUTE NM HYD	107.00	36	.00304	3.81	.108	.66798	1.533	1.956
PER IMP= 2.00								
COMPUTE NM HYD	108.00	37	.00184	4.49	.159	1.62143	1.500	3.814
PER IMP= 64.00								
FINISH								

```
* CENTRAL NEW MEXICO COMMUNITY COLLEGE
* MASTER DRAINAGE PLAN
* EXISTING CONDITIONS MODEL
* 100 YR 24 HR STORM EVENT
* DATE: August 2010
*

*S**************************************************************************
*S
*S       100 YEAR 24 HOUR STORM   EXISTING RUNOFF ANALYSIS
*S       RAINFALL DATA FROM DPM Chapter 22   ZONE 1
*S
*S**************************************************************************

START            0.0 HOURS
RAINFALL         TYPE=2  RAIN QUARTER=0.0 IN
                 RAIN ONE=1.90IN RAIN SIX=2.26 IN
                 RAIN DAY=2.75 IN         DT=0.05 HR

**** SEDIMENT BULK FACTOR
SEDIMENT BULK    CODE=1  BULK FACTOR=1.10
**************************************************************************
*
**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 1 (OS1)
**************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=3     ISLOPE=0
                 LENGTH=400       SLOPE=0.016      K=.7
                 LENGTH=1600      SLOPE=0.015      K=2.0
                 LENGTH=95        SLOPE=0.037      K=3.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=1     HYD NO=OS 1      DA=0.04948 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.0   MASS RAIN= 1

PRINT HYD        ID=1     CODE=1

**** ROUTE OS 1 THRU RW 2 TO GET OS 1Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.015  FP SLP=0.015  N=0.035
                     DIST=50 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     5       20     0       30     0      50     5

ROUTE MCUNGE         ID=2  HYD NO=OS 1Rt  INFLOW ID=1
                     DT=0.0 HR  LEN=160 FT
                     NS=0  SLP=0.02

PRINT HYD        ID=2     CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN RW 2A
**************************************************************************
*
*ONLY INCLUDES PORTION OF BASIN DIRECTED EAST TO EXISTING PHASE II
*
COMPUTE NM HYD   ID=3     HYD NO=RW 2A     DA=0.00572 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=3     CODE=1


***** ADD OS 1Rt TO BASIN RW 2 TO GET BASIN DP E4
ADD HYD              ID=4  HYD NO=DP E4  INFLOW IDS= 2 AND 3
PRINT HYD            ID=4   CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN RW 2B
**************************************************************************
*
*ONLY INCLUDES PORTION OF BASIN RW2 DIRECTED WEST TO FUTURE PHASES
*
COMPUTE NM HYD   ID=38    HYD NO=RW 2B     DA=0.00237 SQ MI
                 PER A=100    PER B=0    PER C=0    PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=38    CODE=1
```

```
**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2A (OS2A)
**************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3     ISLOPE=0
                LENGTH=300       SLOPE=0.023     K=.7
                LENGTH=1700      SLOPE=0.018     K=2.0
                LENGTH=2855      SLOPE=0.014     K=3.0
                KN=0.033         CENTROID DISTANCE = 2420

COMPUTE NM HYD  ID=5    HYD NO=OS 2A    DA=0.08310 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=5    CODE=1

**** ROUTE OS 2A THRU OS 2C TO GET OS 2ARt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                    MIN ELEV=0 FT  MAX ELEV=5 FT
                    CH SLP=0.015  FP SLP=0.015  N=0.035
                    DIST=50 FT
                    DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                      0     5     20     0      30     0      50     5

ROUTE MCUNGE        ID=6  HYD NO=OS 2ARt  INFLOW ID=5
                    DT=0.0 HR  LEN=1600 FT
                    NS=0  SLP=0.015

PRINT HYD       ID=6    CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2B (OS2B)
**************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=300       SLOPE=0.037     K=.7
                LENGTH=1200      SLOPE=0.021     K=2.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=7    HYD NO=OS 2B    DA=0.02989 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=7    CODE=1


**** ROUTE OS 2B THRU OS 2D TO GET OS 2BRt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                    MIN ELEV=0 FT  MAX ELEV=5 FT
                    CH SLP=0.008  FP SLP=0.008  N=0.035
                    DIST=50 FT
                    DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                      0     5     20     0      30     0      50     5

ROUTE MCUNGE        ID=8  HYD NO=OS 2BRt  INFLOW ID=7
                    DT=0.0 HR  LEN=1600 FT
                    NS=0  SLP=0.008

PRINT HYD       ID=8    CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2C (OS2C)
**************************************************************************
*
*

COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=350       SLOPE=0.014     K=.7
                LENGTH=1230      SLOPE=0.017     K=2.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=9    HYD NO=OS 2C    DA=0.02511 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=9    CODE=1

***** ADD OS 2C TO OS 2ARt TO GET DP E1C
ADD HYD             ID=10  HYD NO=DP E1C  INFLOW IDS= 6 AND 9
PRINT HYD           ID=10   CODE=5
```

```
**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2D (OS2D)
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2     ISLOPE=0
                LENGTH=300       SLOPE=0.043      K=.7
                LENGTH=1485      SLOPE=0.009      K=2.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=11   HYD NO=OS 2D     DA=0.03608 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=11   CODE=1

***** ADD OS 2D TO OS 2BRt TO GET DP E1D
ADD HYD              ID=12  HYD NO=DP E1D  INFLOW IDS= 8 AND 11
PRINT HYD            ID=12   CODE=5

***** ADD BASIN DP E1C TO BASIN DP E1D TO GET DP E1
ADD HYD              ID=13  HYD NO=DP E1  INFLOW IDS= 10 AND 12
PRINT HYD            ID=13   CODE=5

**** ROUTE DP E1 THRU OS 2E TO GET DP E1Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.019  FP SLP=0.019  N=0.035
                     DIST=55 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     5       20     0       35     0      55     5

ROUTE MCUNGE         ID=14  HYD NO=DP E1Rt  INFLOW ID=13
                     DT=0.0 HR  LEN=3290 FT
                     NS=0  SLP=0.019

PRINT HYD       ID=14   CODE=1

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 2E (OS2E)
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3     ISLOPE=0
                LENGTH=400       SLOPE=0.043      K=.7
                LENGTH=1600      SLOPE=0.019      K=2.0
                LENGTH=1850      SLOPE=0.019      K=3.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=15   HYD NO=OS 2E     DA=0.10413 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=15   CODE=1

***** ADD OS 2E TO DP E1Rt TO GET DP E2
ADD HYD              ID=16 HYD NO=DP E2  INFLOW IDS= 14 AND 15
PRINT HYD            ID=16   CODE=5

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 3 (OS3)
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3     ISLOPE=0
                LENGTH=400       SLOPE=0.043      K=.7
                LENGTH=1600      SLOPE=0.019      K=2.0
                LENGTH=1850      SLOPE=0.019      K=3.0
                KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=17   HYD NO=OS 3      DA=0.13370 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=17   CODE=1

**** ROUTE DP E2 THRU OS 3 TO GET DP E2Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.025  FP SLP=0.025  N=0.035
                     DIST=55 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     5       20     0       35     0      55     5
```

```
ROUTE MCUNGE          ID=18  HYD NO=DP E2Rt  INFLOW ID=16
                      DT=0.0 HR  LEN=2275 FT
                      NS=0   SLP=0.025

***** ADD OS 3 TO DP E2Rt TO GET BASIN DP E3
ADD HYD               ID=19 HYD NO=DP E3  INFLOW IDS= 17 AND 18
PRINT HYD             ID=19   CODE=5

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 4 (OS4)
**********************************************************************
*
COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=300       SLOPE=0.025      K=.7
                 LENGTH=1600      SLOPE=0.021      K=2.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=20   HYD NO=OS 4      DA=0.01158 SQ MI
                 PER A=100   PER B=0   PER C=0   PER D=0
                 TP=0.0  MASS RAIN= 1

PRINT HYD        ID=20   CODE=1


**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 4A (OS 4A)
**********************************************************************
*
COMPUTE NM HYD   ID=21   HYD NO=OS 4A     DA=0.00221 SQ MI
                 PER A=100   PER B=0   PER C=0   PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=21   CODE=1

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN 5 (OS5)
**********************************************************************
*
COMPUTE NM HYD   ID=22   HYD NO=OS 5      DA=0.00188 SQ MI
                 PER A=100   PER B=0   PER C=0   PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=22   CODE=1

**********************************************************************
*       COMPUTE HYD FOR OFFSITE SUB BASIN A (OSA) (DOES NOT CONTRIBUTE)
**********************************************************************
*
COMPUTE LT TP    LCODE=1 NK=3     ISLOPE=0
                 LENGTH=400       SLOPE=0.018      K=.7
                 LENGTH=1600      SLOPE=0.019      K=2.0
                 LENGTH=4175      SLOPE=0.023      K=3.0
                 KN=0.033         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=23   HYD NO=OS A      DA=0.31628 SQ MI
                 PER A=100   PER B=0   PER C=0   PER D=0
                 TP=0.0  MASS RAIN= 1

PRINT HYD        ID=23   CODE=1

**** EXISTING ONSITE ANALYSIS
**** EXISTING OFFSITE FLOWS ONSITE
*
**********************************************************************
*
**********************************************************************
*       COMPUTE HYD FOR ON SITE SUB BASIN 101
**********************************************************************
*
COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=300       SLOPE=0.023      K=.7
                 LENGTH=1600      SLOPE=0.026      K=2.0
                 KN=0.030         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=24   HYD NO=101       DA=0.03061 SQ MI
                 PER A=51    PER B=35   PER C=14   PER D=0
                 TP=0.0  MASS RAIN= 1
```

```
PRINT HYD        ID=24    CODE=1

**** ROUTE OS 4 THRU 101 TO GET OS 4Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=3 FT
                     CH SLP=0.025  FP SLP=0.025  N=0.035
                     DIST=48 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     3       18     0       30     0      48     3

ROUTE MCUNGE         ID=25  HYD NO=OS 4Rt  INFLOW ID=20
                     DT=0.0 HR  LEN=1100 FT
                     NS=0  SLP=0.025

PRINT HYD        ID=25    CODE=5

***** ADD 101 TO OS 4Rt TO GET BASIN DP E6
ADD HYD              ID=26 HYD NO=DP E6  INFLOW IDS= 24 AND 25
PRINT HYD            ID=26   CODE=5

*************************************************************************
*       COMPUTE HYD FOR ON SITE SUB BASIN 102
*************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=300       SLOPE=0.030      K=.7
                 LENGTH=1680      SLOPE=0.023      K=2.0
                 KN=0.030         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=27   HYD NO=102       DA=0.02698 SQ MI
                 PER A=69   PER B=10   PER C=20   PER D=1
                 TP=0.0  MASS RAIN= 1

PRINT HYD        ID=27   CODE=1

**** ROUTE DP 3 THRU 102 TO GET DP 3Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.019  FP SLP=0.019  N=0.035
                     DIST=48 FT
                     DIST  ELEV     DIST  ELEV     DIST  ELEV    DIST  ELEV
                        0     3       18     0       30     0      48     3

ROUTE MCUNGE         ID=28  HYD NO=OS 3Rt  INFLOW ID=19
                     DT=0.0 HR  LEN=1500 FT
                     NS=0  SLP=0.019

PRINT HYD        ID=28   CODE=5

**** ADD 102 TO DP 3Rt TO GET BASIN DP E7
ADD HYD              ID=29 HYD NO=DP E7  INFLOW IDS= 27 AND 28
PRINT HYD            ID=29   CODE=5


*************************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 103
*************************************************************************
*

COMPUTE NM HYD   ID=30   HYD NO=103       DA=0.00106 SQ MI
                 PER A=0   PER B=0   PER C=100   PER D=0
                 TP=0.1333  MASS RAIN= 1

PRINT HYD        ID=30   CODE=1


*************************************************************************
*       COMPUTE HYD FOR ON SITE SUB BASIN 104
*************************************************************************
*

COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=300       SLOPE=0.030      K=.7
                 LENGTH=1680      SLOPE=0.016      K=2.0
                 KN=0.030         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=31   HYD NO=104       DA=0.02131 SQ MI
                 PER A=76   PER B=0   PER C=23   PER D=1
                 TP=0.0  MASS RAIN= 1

PRINT HYD        ID=31   CODE=1
```

```
**** ROUTE RW 2B THRU 104 TO GET RW 2BRt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                     MIN ELEV=0 FT  MAX ELEV=5 FT
                     CH SLP=0.015  FP SLP=0.015  N=0.035
                     DIST=48 FT
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                        0     5      20     0      30     0      50     5

ROUTE MCUNGE         ID=32  HYD NO=RW 2BRt  INFLOW ID=38
                     DT=0.0 HR  LEN=1500 FT
                     NS=0  SLP=0.015

PRINT HYD       ID=32   CODE=5

***** ADD 104 TO RW 2BRt TO GET DP E5
ADD HYD              ID=33 HYD NO=DP E5  INFLOW IDS= 31 AND 32
PRINT HYD            ID=33   CODE=5

**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 105
**********************************************************************
*
**** REMOVE SEDIMENT BULK FACTOR FOR BASINS 105,106,107,108
SEDIMENT BULK   CODE=1  BULK FACTOR=1.00

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=150      SLOPE=0.018     K=.7
                LENGTH=250      SLOPE=0.019     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=34   HYD NO=105      DA=0.00456 SQ MI
                PER A=0   PER B=13  PER C=26   PER D=62
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=34   CODE=1

**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 106
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=250      SLOPE=0.018     K=.7
                LENGTH=250      SLOPE=0.019     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=35   HYD NO=106      DA=0.00304 SQ MI
                PER A=0   PER B=24   PER C=48   PER D=28
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=35   CODE=1

**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 107
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=225      SLOPE=0.036     K=.7
                LENGTH=235      SLOPE=0.038     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=36   HYD NO=107      DA=0.00304 SQ MI
                PER A=60  PER B=0   PER C=38   PER D=2
                TP=0.0  MASS RAIN= 1

PRINT HYD       ID=36   CODE=1

**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB BASIN 108
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=.7
                LENGTH=700      SLOPE=0.011     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=37   HYD NO=108   DA=0.00184 SQ MI
                PER A=0   PER B=12   PER C=24   PER D=64
                TP=0.0  MASS RAIN= 1
```

```
PRINT HYD       ID=37   CODE=1

FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO 97) VERSION: 1997.02c RUN DATE (MON/DAY/YR) =08/25/2010
INPUT FILE = 100YRE24.DAT USER NO. =
AHYMO C 9803c01UNMLIB AH

PAGE = 1

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE
NOTATION									
*S**********									
*S									
*S	100 YEAR 24 HOUR STORM EXISTING RUNOFF ANALYSIS								
*S	RAINFALL DATA FROM DPM Chapter 22 ZONE 1								
*S									
*S**********									
START									
TIME= .00									
RAINFALL TYPE= 2									
RAIN24= 2.750									
SEDIMENT BULK									
PK BF = 1.10									
COMPUTE NM HYD	OS 1		1	.04948	32.24	1.352	.51224	1.600	1.018
PER IMP= .00									
ROUTE MCUNGE	OS 1Rt	1	2	.04948	31.60	1.347	.51057	1.650	.998
CCODE = .1									
COMPUTE NM HYD	RW 2A		3	.00572	5.48	.156	.51225	1.500	1.496
PER IMP= .00									
ADD HYD	DP E4	2& 3	4	.05520	35.85	1.504	.51073	1.600	1.015
COMPUTE NM HYD	RW 2B		38	.00237	2.27	.065	.51225	1.500	1.498
PER IMP= .00									
COMPUTE NM HYD	OS 2A		5	.08310	40.14	2.270	.51225	1.650	.755
PER IMP= .00									
ROUTE MCUNGE	OS 2ARt	5	6	.08310	39.80	2.261	.51010	1.850	.748
CCODE = .1									
COMPUTE NM HYD	OS 2B		7	.02989	28.58	.817	.51224	1.500	1.494
PER IMP= .00									
ROUTE MCUNGE	OS 2BRt	7	8	.02989	26.09	.797	.49995	1.750	1.364
CCODE = .1									
COMPUTE NM HYD	OS 2C		9	.02511	20.14	.686	.51224	1.550	1.253
PER IMP= .00									
ADD HYD	DP E1C	8& 9	10	.10821	46.55	2.947	.51059	1.800	.672
COMPUTE NM HYD	OS 2D		11	.03608	26.23	.986	.51225	1.550	1.136
PER IMP= .00									
ADD HYD	DP E1D	8&11	12	.06597	44.84	1.783	.50666	1.700	1.062
ADD HYD	DP E1	10&12	13	.17418	86.10	4.729	.50910	1.750	.772
ROUTE MCUNGE	DP E1Rt	13	14	.17418	84.66	4.711	.50712	2.000	.759
CCODE = .1									
COMPUTE NM HYD	OS 2E		15	.10413	59.91	2.845	.51225	1.600	.899
PER IMP= .00									
ADD HYD	DP E2	14&15	16	.27831	105.83	7.556	.50904	2.000	.594
COMPUTE NM HYD	OS 3		17	.13370	78.25	3.653	.51225	1.600	.915
PER IMP= .00									
ROUTE MCUNGE	DP E2Rt	16	18	.27831	105.24	7.561	.50939	2.100	.591
CCODE = .2									
ADD HYD	DP E3	17&18	19	.41201	136.13	11.214	.51032	1.650	.516
COMPUTE NM HYD	OS 4		20	.01158	9.93	.316	.51225	1.550	1.339
PER IMP= .00									
COMPUTE NM HYD	OS 4A		21	.00221	2.12	.060	.51225	1.500	1.498
PER IMP= .00									
COMPUTE NM HYD	OS 5		22	.00188	1.80	.051	.51224	1.500	1.499
PER IMP= .00									
COMPUTE NM HYD	OS A		23	.31628	170.73	8.641	.51224	1.700	.843
PER IMP= .00									
COMPUTE NM HYD	101.00		24	.03061	35.70	1.082	.66303	1.550	1.822
PER IMP= .00									
ROUTE MCUNGE	OS 4Rt	20	25	.01158	9.69	.315	.50986	1.750	1.307
CCODE = .1									
ADD HYD	DP E6	24&25	26	.04219	36.01	1.397	.62097	1.550	1.334
COMPUTE NM HYD	102.00		27	.02698	29.78	.937	.65128	1.550	1.725
PER IMP= 1.00									
ROUTE MCUNGE	OS 3Rt	19	28	.41201	134.52	11.193	.50936	1.800	.510
CCODE = .1									
ADD HYD	DP E7	27&28	29	.43899	143.47	12.130	.51808	1.800	.511
COMPUTE NM HYD	103.00		30	.00106	2.19	.064	1.13359	1.500	3.227
PER IMP= .00									
COMPUTE NM HYD	104.00		31	.02131	21.14	.728	.64078	1.550	1.550
PER IMP= 1.00									
ROUTE MCUNGE	RW 2BRt	38	32	.00237	2.18	.064	.50347	1.950	1.437
CCODE = .1									
ADD HYD	DP E5	31&32	33	.02368	21.14	.792	.62700	1.550	1.395
SEDIMENT BULK									

PK BF = 1.00
COMPUTE NM HYD 105.00 34 .00456 10.82 .461 1.89376 1 500 3.707
PER IMP= 61.39
COMPUTE NM HYD 106.00 35 .00304 6.09 .220 1.35620 1 500 3.131
PER IMP= 28.00
COMPUTE NM HYD 107.00 36 .00304 3.78 .110 .67589 1 500 1.942
PER IMP= 2.00
COMPUTE NM HYD 108.00 37 .00184 4.43 .190 1.93585 1.500 3.760
PER IMP= 64.00
FINISH

```
* CENTRAL NEW MEXICO COMMUNITY COLLEGE
* DRAINAGE MASTER PLAN
* FINAL (PHASE VII) CONDITIONS MODEL
* 100 YR 6 HR STORM EVENT
* DATE: November 2010
*
*S**************************************************************************
*S
*S      100 YEAR 6 HOUR STORM - PROPOSED RUNOFF ANALYSIS
*S      RAINFALL DATA FROM DPM Chapter 22 - ZONE 1
*S
*S**************************************************************************

START           0.0 HOURS
RAINFALL        TYPE=1  RAIN QUARTER=0.0 IN
                RAIN ONE=1.90IN RAIN SIX=2.26 IN
                RAIN DAY=2.75 IN        DT=0.0333 HR

**** SEDIMENT BULK FACTOR ADDED TO BASIN OS-1 ONLY
SEDIMENT BULK   CODE=1  BULK FACTOR=1.10
**************************************************************************
*
**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB-BASIN OS-1
**************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3    ISLOPE=0
                LENGTH=400      SLOPE=0.016     K=0.7
                LENGTH=1600     SLOPE=0.015     K=2.0
                LENGTH=95       SLOPE=0.037     K=3.0
                KN=0.033        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=1    HYD NO=OS-1     DA=0.04948 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=1    CODE=1

*****ROUTE OS-1 THROUGH RW-2 TO GET OS-1Rt
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=2  HYD NO=OS-1Rt  INFLOW ID=1
                        DT=0 HR  LENGTH=160 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=2    CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB-BASIN RW-2
**************************************************************************
*
**** REMOVE SEDIMENT BULK FACTOR FOR DEVELOPED BASINS
SEDIMENT BULK   CODE=1  BULK FACTOR=1.00

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=1.0
                LENGTH=775      SLOPE=0.027     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=3    HYD NO=RW-2     DA=0.00809 SQ MI
                PER A=0   PER B=0   PER C=40   PER D=60
                TP=0.0  MASS RAIN=-1


PRINT HYD       ID=3    CODE=1

***** ADD OS-1Rt TO RW-2 TO GET DP-4
ADD HYD             ID=4  HYD NO=DP-4  INFLOW IDS= 2 AND 3

PRINT HYD           ID=4   CODE=5


**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB-BASIN OS-6
**************************************************************************
*
```

```
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=1.0
                LENGTH=450      SLOPE=0.029     K=3.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=5    HYD NO=OS-6     DA=0.00536 SQ MI
                PER A=0   PER B=4   PER C=6   PER D=90
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=5    CODE=1


**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 301
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.030     K=0.7
                LENGTH=285      SLOPE=0.014     K=3.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=6    HYD NO=301      DA=0.00335 SQ MI
                PER A=0   PER B=0   PER C=65   PER D=35
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=6    CODE=1

***** ADD BASIN OS-6 TO BASIN 301 TO GET DP-1
ADD HYD             ID=7  HYD NO=DP-1  INFLOW IDS= 5 AND 6

PRINT HYD       ID=7    CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 302
**************************************************************************
*
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=40       SLOPE=0.050     K=0.7
                LENGTH=565      SLOPE=0.027     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=8    HYD NO=302      DA=0.00614 SQ MI
                PER A=0   PER B=0   PER C=20   PER D=80
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=8    CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 303
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=133      SLOPE=0.045     K=0.7
                LENGTH=688      SLOPE=0.019     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=9    HYD NO=303      DA=0.00292 SQ MI
                PER A=0   PER B=0   PER C=45   PER D=55
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=9    CODE=1

***** ADD BASIN 302 TO BASIN 303 TO GET DP-2
ADD HYD             ID=10  HYD NO=DP-2  INFLOW IDS= 8 AND 9

PRINT HYD       ID=10   CODE=5

*****ROUTE DP-1 TO DP-3
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=30 IN   N=0.013
*
ROUTE MCUNGE            ID=11  HYD NO=DP-1Rt  INFLOW ID=7
                        DT=0 HR  LENGTH=180 FT
                        NS=0  SLOPE=0.020
```

```
PRINT HYD       ID=11   CODE=1

***** ADD DP-1Rt TO DP-2 TO GET DP-3
ADD HYD             ID=12  HYD NO=DP-3  INFLOW IDS= 10 AND 11

PRINT HYD       ID=12   CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 304
*****************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.020     K=0.7
                LENGTH=515      SLOPE=0.021     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=13   HYD NO=304      DA=0.00484 SQ MI
                PER A=0   PER B=0   PER C=45   PER D=55
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=13   CODE=1

*****ROUTE DP-4 TO DP-5
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=14  HYD NO=DP-4Rt  INFLOW ID=4
                        DT=0 HR  LENGTH=330 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=14   CODE=1

***** ADD DP-4Rt TO BASIN 304 TO GET DP-5
ADD HYD             ID=15 HYD NO=DP-5  INFLOW IDS= 13 AND 14

PRINT HYD           ID=15   CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 305
*****************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.020     K=0.7
                LENGTH=460      SLOPE=0.015     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=16   HYD NO=305      DA=0.00487 SQ MI
                PER A=0   PER B=14   PER C=32   PER D=54
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=16   CODE=1

*****ROUTE DP-3 TO DP-6
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=17  HYD NO=DP-3Rt  INFLOW ID=12
                        DT=0 HR  LENGTH=525 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=17   CODE=1

***** ADD DP-3Rt TO BASIN 105 TO GET DP-6
ADD HYD             ID=18 HYD NO=DP-6  INFLOW IDS= 16 AND 17

PRINT HYD           ID=18   CODE=5

*****ROUTE DP-5 TO DP-6A
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=19  HYD NO=DP-5Rt  INFLOW ID=15
                        DT=0 HR  LENGTH=355 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=19   CODE=1
```

```
***** ADD DP-5Rt TO DP-6 TO GET DP-6A
ADD HYD              ID=20 HYD NO=DP-6A  INFLOW IDS= 18 AND 19

PRINT HYD            ID=20   CODE=5


**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 306
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.015     K=0.7
                LENGTH=500      SLOPE=0.010     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=21   HYD NO=306      DA=0.00473 SQ MI
                PER A=0   PER B=14   PER C=38   PER D=48
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=21   CODE=1

*****ROUTE DP-6A TO DP-7
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=48 IN   N=0.013
*
ROUTE MCUNGE            ID=22  HYD NO=DP-6ARt  INFLOW ID=20
                        DT=0 HR  LENGTH=200 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=22   CODE=1


***** ADD DP-6A TO BASIN 306 TO GET DP-7
ADD HYD              ID=23 HYD NO=DP-7  INFLOW IDS= 20 AND 21
PRINT HYD            ID=23   CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 307
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=0.7
                LENGTH=340      SLOPE=0.015     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=24   HYD NO=307      DA=0.00305 SQ MI
                PER A=0   PER B=12   PER C=34   PER D=54
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=24   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 308
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=75       SLOPE=0.013     K=1.0
                LENGTH=600      SLOPE=0.020     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=25   HYD NO=308      DA=0.00474 SQ MI
                PER A=0   PER B=0   PER C=40   PER D=60
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=25   CODE=1

*****ROUTE BASIN 308 TO DP-10
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=24 IN   N=0.013
*
ROUTE MCUNGE            ID=26  HYD NO=308Rt  INFLOW ID=25
                        DT=0 HR  LENGTH=405 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=26   CODE=5
```

```
*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 309
*****************************************************************************
*
COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=200       SLOPE=0.025      K=0.7
                 LENGTH=535       SLOPE=0.028      K=2.0
                 KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=27   HYD NO=309       DA=0.00338 SQ MI
                 PER A=0    PER B=0    PER C=60    PER D=40
                 TP=0.0  MASS RAIN=-1

PRINT HYD        ID=27   CODE=1

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 310
*****************************************************************************
*
COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=200       SLOPE=0.010      K=0.7
                 LENGTH=200       SLOPE=0.025      K=2.0
                 KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=28   HYD NO=310       DA=0.00344 SQ MI
                 PER A=0    PER B=11   PER C=29    PER D=60
                 TP=0.0  MASS RAIN=-1

PRINT HYD        ID=28   CODE=1

***** ADD BASIN 308Rt TO BASIN 310 TO GET DP-10
ADD HYD              ID=29 HYD NO=DP-10  INFLOW IDS= 25 AND 28

PRINT HYD            ID=29   CODE=5

***** ADD DP-10 TO BASIN 309 TO GET DP-11
ADD HYD              ID=30 HYD NO=DP-11  INFLOW IDS= 27 AND 29
PRINT HYD            ID=30   CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 311
*****************************************************************************
*
COMPUTE LT TP    LCODE=1 NK=2     ISLOPE=0
                 LENGTH=50        SLOPE=0.020      K=1.0
                 LENGTH=410       SLOPE=0.017      K=2.0
                 KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD   ID=31   HYD NO=311       DA=0.00214 SQ MI
                 PER A=0    PER B=11  PER C=33    PER D=56
                 TP=0.0  MASS RAIN=-1

PRINT HYD        ID=31   CODE=1

*****ROUTE DP-7 TO DP-8
COMPUTE RATING CURVE     CID=1   VS NO=1 CODE=-1   SLP=0.020
                         DIA=48 IN   N=0.013
*
ROUTE MCUNGE             ID=32  HYD NO=DP-7Rt  INFLOW ID=23
                         DT=0 HR  LENGTH=405 FT
                         NS=0  SLOPE=0.020

PRINT HYD        ID=32   CODE=5

***** ADD BASIN 311 TO DP-7 TO GET DP-8
ADD HYD              ID=33 HYD NO=DP-8  INFLOW IDS= 31 AND 32
PRINT HYD            ID=33   CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 312A
*****************************************************************************
*
COMPUTE NM HYD   ID=34   HYD NO=312A      DA=0.00214 SQ MI
                 PER A=0    PER B=8    PER C=24    PER D=68
```

```
               TP=0.1333  MASS RAIN=-1

PRINT HYD      ID=34   CODE=1
*
*
************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 312B
************************************************************************
*

COMPUTE NM HYD  ID=37   HYD NO=312B     DA=0.00171 SQ MI
               PER A=0   PER B=15   PER C=29   PER D=56
               TP=0.1333  MASS RAIN=-1

PRINT HYD      ID=37   CODE=1

***** ADD BASIN 312A TO 312B
ADD HYD             ID=38 HYD NO=DP-13  INFLOW IDS= 34 AND 37
PRINT HYD           ID=38   CODE=5

************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 313
************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
               LENGTH=75       SLOPE=0.013     K=0.7
               LENGTH=100      SLOPE=0.010     K=2.0
               KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=39   HYD NO=313      DA=0.00099 SQ MI
               PER A=0   PER B=13  PER C=33   PER D=54
               TP=0.0  MASS RAIN=-1

PRINT HYD      ID=39   CODE=1

*****ROUTE DP-8 THROUGH BASIN 313

COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=48 IN   N=0.013
*
ROUTE MCUNGE            ID=40  HYD NO=DP-8Rt  INFLOW ID=33
                        DT=0 HR  LENGTH=130 FT
                        NS=0  SLOPE=0.020

PRINT HYD      ID=40   CODE=5

***** ADD BASIN 313 TO DP-8Rt TO GET DP-9
ADD HYD             ID=41 HYD NO=DP-9  INFLOW IDS= 39 AND 40
PRINT HYD           ID=41   CODE=5

***** ADD DP-9 TO DP-11 TO GET DP-11A
ADD HYD             ID=42 HYD NO=DP-11A  INFLOW IDS= 30 AND 41
PRINT HYD           ID=42   CODE=5

************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 314
************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
               LENGTH=300      SLOPE=0.010     K=0.7
               LENGTH=510      SLOPE=0.026     K=2.0
               KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=43   HYD NO=314      DA=0.00153 SQ MI
               PER A=0   PER B=90  PER C=3   PER D=7
               TP=0.0  MASS RAIN=-1

PRINT HYD      ID=43   CODE=1


************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 315
************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3    ISLOPE=0
               LENGTH=75       SLOPE=0.060     K=0.7
```

```
                LENGTH=60       SLOPE=0.016     K=2.0
                LENGTH=265      SLOPE=0.005     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=44   HYD NO=315      DA=0.00318 SQ MI
                PER A=0   PER B=55  PER C=40  PER D=5
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=44   CODE=1

***** ADD BASIN 314 TO DP-11A TO GET DP-11B
ADD HYD             ID=45 HYD NO=DP-11B  INFLOW IDS= 42 AND 43
PRINT HYD           ID=45   CODE=5

***** ADD BASIN 315 TO DP-11B TO DP-12
ADD HYD             ID=46 HYD NO=DP-12  INFLOW IDS= 44 AND 45
PRINT HYD           ID=46   CODE=5

****ROUTE DP-12 THROUGH RESERVIOR
*
ROUTE RESERVOIR         ID=60  HYD NO=POND3  INFLOW ID=46  CODE=1
                        OUTFLOW (CFS)     STORAGE (AC FT)       ELEV
                        0.01                    0.00            5420.0
                        11.50                   0.28            5420.33
                        32.70                   0.55            5420.66
                        60.00                   0.84            5421.00
                        92.30                   1.16            5421.33
                        129.00                  1.48            5421.66
                        169.70                  1.79            5422.00
                        183.00                  2.15            5422.33
                        188.20                  2.51            5422.66
                        193.40                  2.87            5423.00


COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=54 IN   N=0.013
*
ROUTE MCUNGE            ID=61  HYD NO=POND3Rt  INFLOW ID=60
                        DT=0 HR  LENGTH=400 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=61   CODE=5

*************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 316A
*************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=75       SLOPE=0.010     K=1.0
                LENGTH=425      SLOPE=0.010     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=47   HYD NO=316A     DA=0.00400 SQ MI
                PER A=0   PER B=10  PER C=20   PER D=70
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=47   CODE=1

*************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 316B
*************************************************************************
*

COMPUTE NM HYD  ID=48   HYD NO=316B     DA=0.00066 SQ MI
                PER A=0   PER B=17   PER C=41   PER D=42
                TP=0.1333  MASS RAIN=-1

PRINT HYD       ID=48   CODE=1

*****ROUTE BASIN 316B THROUGH BASIN 323 TO GET 316Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                    MIN ELEV=0 FT  MAX ELEV=1 FT
                    CH SLP=0.011  FP SLP=0.011  N=0.016
                    DIST=15 FT
                    DIST  ELEV    DIST  ELEV    DIST  ELEV   DIST  ELEV
                       0     2      0     0      15     1     15     2
```

```
ROUTE MCUNGE          ID=49  HYD NO=316Rt  INFLOW ID=48
                      DT=0.0 HR  LEN=725 FT
                      NS=0  SLP=0.011

PRINT HYD         ID=49   CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 317
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=4     ISLOPE=0
                  LENGTH=300       SLOPE=0.013      K=0.7
                  LENGTH=585       SLOPE=0.039      K=2.0
                  LENGTH=1115      SLOPE=0.012      K=2.0
                  LENGTH=260       SLOPE=0.012      K=3.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=50   HYD NO=317       DA=0.02810 SQ MI
                  PER A=26    PER B=49  PER C=20    PER D=5
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=50   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 318
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
                  LENGTH=100       SLOPE=0.050      K=0.7
                  LENGTH=100       SLOPE=0.050      K=2.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=51   HYD NO=318       DA=0.00095 SQ MI
                  PER A=0    PER B=18  PER C=43    PER D=39
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=51   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 319
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
                  LENGTH=50        SLOPE=0.005      K=1.0
                  LENGTH=450       SLOPE=0.005      K=2.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=52   HYD NO=319       DA=0.00405 SQ MI
                  PER A=0    PER B=0   PER C=30    PER D=70
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=52   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 320
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
                  LENGTH=50        SLOPE=0.005      K=1.0
                  LENGTH=900       SLOPE=0.005      K=2.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=53   HYD NO=320       DA=0.00266 SQ MI
                  PER A=0    PER B=0   PER C=10    PER D=90
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=53   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 321
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
```

```
                LENGTH=50        SLOPE=0.011      K=1.0
                LENGTH=700       SLOPE=0.011      K=2.0
                KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=54   HYD NO=321       DA=0.00184 SQ MI
                PER A=0   PER B=12  PER C=24   PER D=64
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=54   CODE=1

***** ADD 316Rt TO BASIN 321 TO GET DP-14
ADD HYD              ID=55 HYD NO=DP-14  INFLOW IDS= 49 AND 54
PRINT HYD            ID=55   CODE=5

FINISH
```

AHYMO.SUM

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =11/16/2010

INPUT FILE = 100yre6.dat USER NO.= AHYMO-C-9803c01UNMLIB-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
*S**											
*S											
*S	100 YEAR 6 HOUR STORM - PROPOSED RUNOFF ANALYSIS										
*S	RAINFALL DATA FROM DPM Chapter 22 - ZONE 1										
*S											
*S**											
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.260
SEDIMENT BULK										PK BF =	1.10
COMPUTE NM HYD	OS-1	-	1	.04948	32.42	1.356	.51368	1.598	1.024	PER IMP=	.00
ROUTE MCUNGE	OS-1Rt	1	2	.04948	32.42	1.356	.51368	1.598	1.024	CCODE =	.0
SEDIMENT BULK										PK BF =	1.00
COMPUTE NM HYD	RW-2	-	3	.00809	19.94	.702	1.62699	1.499	3.851	PER IMP=	60.00
ADD HYD	DP-4	2& 3	4	.05757	48.51	2.058	.67012	1.565	1.317		
COMPUTE NM HYD	OS-6	-	5	.00536	14.63	.546	1.90950	1.499	4.265	PER IMP=	90.00
COMPUTE NM HYD	301.00	-	6	.00335	7.46	.246	1.37917	1.499	3.482	PER IMP=	35.00
ADD HYD	DP-1	5& 6	7	.00871	22.09	.792	1.70546	1.499	3.964		
COMPUTE NM HYD	302.00	-	8	.00614	16.31	.598	1.82525	1.499	4.150	PER IMP=	80.00
COMPUTE NM HYD	303.00	-	9	.00292	7.07	.246	1.57743	1.499	3.782	PER IMP=	55.00
ADD HYD	DP-2	8& 9	10	.00906	23.38	.843	1.74532	1.499	4.031		
ROUTE MCUNGE	DP-1Rt	7	11	.00871	22.09	.792	1.70546	1.499	3.964	CCODE =	.0
ADD HYD	DP-3	10&11	12	.01777	45.47	1.636	1.72578	1.499	3.998		
COMPUTE NM HYD	304.00	-	13	.00484	11.70	.407	1.57743	1.499	3.778	PER IMP=	55.00
ROUTE MCUNGE	DP-4Rt	4	14	.05757	48.51	2.058	.67012	1.565	1.317	CCODE =	.0
ADD HYD	DP-5	13&14	15	.06241	59.63	2.465	.74048	1.532	1.493		
COMPUTE NM HYD	305.00	-	16	.00487	11.34	.393	1.51441	1.499	3.637	PER IMP=	54.00
ROUTE MCUNGE	DP-3Rt	12	17	.01777	44.95	1.636	1.72586	1.499	3.953	CCODE =	.2
ADD HYD	DP-6	16&17	18	.02264	56.29	2.029	1.68034	1.499	3.885		
ROUTE MCUNGE	DP-5Rt	15	19	.06241	59.63	2.465	.74048	1.532	1.493	CCODE =	.0
ADD HYD	DP-6A	18&19	20	.08505	115.25	4.494	.99067	1.532	2.117		
COMPUTE NM HYD	306.00	-	21	.00473	10.74	.367	1.45445	1.499	3.547	PER IMP=	48.00
ROUTE MCUNGE	DP-6ART	20	22	.08505	115.25	4.494	.99067	1.532	2.117	CCODE =	.0
ADD HYD	DP-7	20&21	23	.08978	125.64	4.861	1.01510	1.532	2.187		
COMPUTE NM HYD	307.00	-	24	.00305	7.14	.248	1.52152	1.499	3.658	PER IMP=	54.00
COMPUTE NM HYD	308.00	-	25	.00474	11.69	.411	1.62699	1.499	3.853	PER IMP=	60.00
ROUTE MCUNGE	308Rt	25	26	.00474	11.54	.411	1.62708	1.499	3.805	CCODE =	.2
COMPUTE NM HYD	309.00	-	27	.00338	7.69	.258	1.42873	1.499	3.556	PER IMP=	40.00
COMPUTE NM HYD	310.00	-	28	.00344	8.27	.291	1.58495	1.499	3.755	PER IMP=	60.00
ADD HYD	DP-10	25&28	29	.00818	19.96	.702	1.60925	1.499	3.812		
ADD HYD	DP-11	27&29	30	.01156	27.65	.960	1.55644	1.499	3.737		
COMPUTE NM HYD	311.00	-	31	.00214	5.07	.176	1.54511	1.499	3.700	PER IMP=	56.00
ROUTE MCUNGE	DP-7Rt	23	32	.08978	125.64	4.861	1.01510	1.532	2.187	CCODE =	.0
ADD HYD	DP-8	31&32	33	.09192	130.53	5.037	1.02744	1.532	2.219		
COMPUTE NM HYD	312A	-	34	.00214	5.35	.191	1.67558	1.499	3.907	PER IMP=	68.00
COMPUTE NM HYD	312B	-	37	.00171	4.02	.140	1.53088	1.499	3.669	PER IMP=	56.00
ADD HYD	DP-13	34&37	38	.00385	9.37	.331	1.61118	1.499	3.801		
COMPUTE NM HYD	313.00	-	39	.00099	2.32	.080	1.51793	1.499	3.666	PER IMP=	54.00
ROUTE MCUNGE	DP-8Rt	33	40	.09192	130.53	5.037	1.02744	1.532	2.219	CCODE =	.0
ADD HYD	DP-9	39&40	41	.09291	132.78	5.117	1.03266	1.532	2.233		

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
ADD HYD	DP-11A	30&41	42	.10447	159.44	6.077	1.09062	1.532	2.385		
COMPUTE NM HYD	314.00	-	43	.00153	2.26	.065	.80045	1.499	2.305	PER IMP=	7.00
COMPUTE NM HYD	315.00	-	44	.00318	5.20	.150	.88479	1.499	2.556	PER IMP=	5.00
ADD HYD	DP-11B	42&43	45	.10600	161.69	6.142	1.08643	1.532	2.383		
ADD HYD	DP-12	44&45	46	.10918	166.84	6.292	1.08055	1.532	2.388		
ROUTE RESERVOIR	POND3	46	60	.10918	124.86	6.303	1.08246	1.632	1.787	AC-FT=	1.444
ROUTE MCUNGE	POND3Rt	60	61	.10918	124.86	6.303	1.08246	1.632	1.787	CCODE =	.0
COMPUTE NM HYD	316A	-	47	.00400	10.02	.360	1.68843	1.499	3.913	PER IMP=	70.00
COMPUTE NM HYD	316B	-	48	.00066	1.46	.049	1.38390	1.499	3.464	PER IMP=	42.00
ROUTE MCUNGE	316Rt	48	49	.00066	1.47	.049	1.38457	1.565	3.486	CCODE =	.2
COMPUTE NM HYD	317.00	-	50	.02810	28.30	1.123	.74950	1.598	1.573	PER IMP=	5.00
COMPUTE NM HYD	318.00	-	51	.00095	2.07	.068	1.35039	1.499	3.400	PER IMP=	39.00
COMPUTE NM HYD	319.00	-	52	.00405	10.38	.373	1.72612	1.499	4.003	PER IMP=	70.00
COMPUTE NM HYD	320.00	-	53	.00266	7.33	.273	1.92438	1.499	4.305	PER IMP=	90.00
COMPUTE NM HYD	321.00	-	54	.00184	4.49	.159	1.62141	1.499	3.813	PER IMP=	64.00
ADD HYD	DP-14	49&54	55	.00250	5.66	.208	1.55858	1.532	3.538		

FINISH

```
* CENTRAL NEW MEXICO COMMUNITY COLLEGE
* DRAINAGE MASTER PLAN
* FINAL (PHASE VII) CONDITIONS MODEL
* 100 YR 24 HR STORM EVENT
* DATE: November 2010
*

*S**************************************************************************
*S
*S      100 YEAR 6 HOUR STORM - PROPOSED RUNOFF ANALYSIS
*S      RAINFALL DATA FROM DPM Chapter 22 - ZONE 1
*S
*S**************************************************************************

START           0.0 HOURS
RAINFALL        TYPE=2  RAIN QUARTER=0.0 IN
                RAIN ONE=1.90IN RAIN SIX=2.26 IN
                RAIN DAY=2.75 IN        DT=0.0333 HR

**** SEDIMENT BULK FACTOR ADDED TO BASIN OS-1 ONLY
SEDIMENT BULK   CODE=1  BULK FACTOR=1.10
**************************************************************************
*
**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB-BASIN OS-1
**************************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3    ISLOPE=0
                LENGTH=400      SLOPE=0.016     K=0.7
                LENGTH=1600     SLOPE=0.015     K=2.0
                LENGTH=95       SLOPE=0.037     K=3.0
                KN=0.033        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=1    HYD NO=OS-1     DA=0.04948 SQ MI
                PER A=100   PER B=0   PER C=0   PER D=0
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=1    CODE=1

*****ROUTE OS-1 THROUGH RW-2 TO GET OS-1Rt
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=2  HYD NO=OS-1Rt  INFLOW ID=1
                        DT=0 HR  LENGTH=160 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=2    CODE=5

**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB-BASIN RW-2
**************************************************************************
*
**** REMOVE SEDIMENT BULK FACTOR FOR DEVELOPED BASINS
SEDIMENT BULK   CODE=1  BULK FACTOR=1.00

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=1.0
                LENGTH=775      SLOPE=0.027     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=3    HYD NO=RW-2     DA=0.00809 SQ MI
                PER A=0   PER B=0   PER C=40   PER D=60
                TP=0.0  MASS RAIN=-1


PRINT HYD       ID=3    CODE=1

***** ADD OS-1Rt TO RW-2 TO GET DP-4
ADD HYD             ID=4  HYD NO=DP-4  INFLOW IDS= 2 AND 3

PRINT HYD           ID=4   CODE=5


**************************************************************************
*       COMPUTE HYD FOR OFFSITE SUB-BASIN OS-6
**************************************************************************
*
```

```
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=1.0
                LENGTH=450      SLOPE=0.029     K=3.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=5    HYD NO=OS-6     DA=0.00536 SQ MI
                PER A=0   PER B=4   PER C=6   PER D=90
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=5    CODE=1


*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 301
*****************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.030     K=0.7
                LENGTH=285      SLOPE=0.014     K=3.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=6    HYD NO=301      DA=0.00335 SQ MI
                PER A=0   PER B=0   PER C=65   PER D=35
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=6    CODE=1

***** ADD BASIN OS-6 TO BASIN 301 TO GET DP-1
ADD HYD             ID=7  HYD NO=DP-1  INFLOW IDS= 5 AND 6

PRINT HYD       ID=7    CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 302
*****************************************************************************
*
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=40       SLOPE=0.050     K=0.7
                LENGTH=565      SLOPE=0.027     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=8    HYD NO=302      DA=0.00614 SQ MI
                PER A=0   PER B=0   PER C=20   PER D=80
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=8    CODE=1

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 303
*****************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=133      SLOPE=0.045     K=0.7
                LENGTH=688      SLOPE=0.019     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=9    HYD NO=303      DA=0.00292 SQ MI
                PER A=0   PER B=0   PER C=45   PER D=55
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=9    CODE=1

***** ADD BASIN 302 TO BASIN 303 TO GET DP-2
ADD HYD             ID=10  HYD NO=DP-2  INFLOW IDS= 8 AND 9

PRINT HYD       ID=10   CODE=5

*****ROUTE DP-1 TO DP-3
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=30 IN   N=0.013
*
ROUTE MCUNGE            ID=11  HYD NO=DP-1Rt  INFLOW ID=7
                        DT=0 HR  LENGTH=180 FT
                        NS=0  SLOPE=0.020
```

```
PRINT HYD       ID=11   CODE=1

***** ADD DP-1Rt TO DP-2 TO GET DP-3
ADD HYD             ID=12  HYD NO=DP-3  INFLOW IDS= 10 AND 11

PRINT HYD       ID=12   CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 304
*****************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.020     K=0.7
                LENGTH=515      SLOPE=0.021     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=13   HYD NO=304      DA=0.00484 SQ MI
                PER A=0   PER B=0   PER C=45   PER D=55
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=13   CODE=1

*****ROUTE DP-4 TO DP-5
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=14  HYD NO=DP-4Rt  INFLOW ID=4
                        DT=0 HR  LENGTH=330 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=14   CODE=1

***** ADD DP-4Rt TO BASIN 304 TO GET DP-5
ADD HYD             ID=15 HYD NO=DP-5  INFLOW IDS= 13 AND 14

PRINT HYD           ID=15   CODE=5

*****************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 305
*****************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.020     K=0.7
                LENGTH=460      SLOPE=0.015     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=16   HYD NO=305      DA=0.00487 SQ MI
                PER A=0   PER B=14   PER C=32   PER D=54
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=16   CODE=1

*****ROUTE DP-3 TO DP-6
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=17  HYD NO=DP-3Rt  INFLOW ID=12
                        DT=0 HR  LENGTH=525 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=17   CODE=1

***** ADD DP-3Rt TO BASIN 105 TO GET DP-6
ADD HYD             ID=18 HYD NO=DP-6  INFLOW IDS= 16 AND 17

PRINT HYD           ID=18   CODE=5

*****ROUTE DP-5 TO DP-6A
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=36 IN   N=0.013
*
ROUTE MCUNGE            ID=19  HYD NO=DP-5Rt  INFLOW ID=15
                        DT=0 HR  LENGTH=355 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=19   CODE=1
```

```
***** ADD DP-5Rt TO DP-6 TO GET DP-6A
ADD HYD              ID=20 HYD NO=DP-6A  INFLOW IDS= 18 AND 19

PRINT HYD            ID=20   CODE=5


**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 306
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.015     K=0.7
                LENGTH=500      SLOPE=0.010     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=21   HYD NO=306      DA=0.00473 SQ MI
                PER A=0   PER B=14   PER C=38   PER D=48
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=21   CODE=1

*****ROUTE DP-6A TO DP-7
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=48 IN   N=0.013
*
ROUTE MCUNGE            ID=22  HYD NO=DP-6ARt  INFLOW ID=20
                        DT=0 HR  LENGTH=200 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=22   CODE=1


***** ADD DP-6A TO BASIN 306 TO GET DP-7
ADD HYD              ID=23 HYD NO=DP-7  INFLOW IDS= 20 AND 21
PRINT HYD            ID=23   CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 307
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=0.7
                LENGTH=340      SLOPE=0.015     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=24   HYD NO=307      DA=0.00305 SQ MI
                PER A=0   PER B=12   PER C=34   PER D=54
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=24   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 308
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=75       SLOPE=0.013     K=1.0
                LENGTH=600      SLOPE=0.020     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=25   HYD NO=308      DA=0.00474 SQ MI
                PER A=0   PER B=0   PER C=40   PER D=60
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=25   CODE=1

*****ROUTE BASIN 308 TO DP-10
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=24 IN   N=0.013
*
ROUTE MCUNGE            ID=26  HYD NO=308Rt  INFLOW ID=25
                        DT=0 HR  LENGTH=405 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=26   CODE=5
```

```
**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 309
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.025     K=0.7
                LENGTH=535      SLOPE=0.028     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=27   HYD NO=309      DA=0.00338 SQ MI
                PER A=0   PER B=0   PER C=60   PER D=40
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=27   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 310
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=200      SLOPE=0.010     K=0.7
                LENGTH=200      SLOPE=0.025     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=28   HYD NO=310      DA=0.00344 SQ MI
                PER A=0   PER B=11   PER C=29   PER D=60
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=28   CODE=1

***** ADD BASIN 308Rt TO BASIN 310 TO GET DP-10
ADD HYD             ID=29 HYD NO=DP-10  INFLOW IDS= 25 AND 28

PRINT HYD           ID=29   CODE=5

***** ADD DP-10 TO BASIN 309 TO GET DP-11
ADD HYD             ID=30 HYD NO=DP-11  INFLOW IDS= 27 AND 29
PRINT HYD           ID=30   CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 311
**************************************************************************
*
COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=50       SLOPE=0.020     K=1.0
                LENGTH=410      SLOPE=0.017     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=31   HYD NO=311      DA=0.00214 SQ MI
                PER A=0   PER B=11  PER C=33   PER D=56
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=31   CODE=1

*****ROUTE DP-7 TO DP-8
COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=48 IN   N=0.013
*
ROUTE MCUNGE            ID=32  HYD NO=DP-7Rt  INFLOW ID=23
                        DT=0 HR  LENGTH=405 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=32   CODE=5

***** ADD BASIN 311 TO DP-7 TO GET DP-8
ADD HYD             ID=33 HYD NO=DP-8  INFLOW IDS= 31 AND 32
PRINT HYD           ID=33   CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 312A
**************************************************************************
*
COMPUTE NM HYD  ID=34   HYD NO=312A     DA=0.00214 SQ MI
                PER A=0   PER B=8   PER C=24   PER D=68
```

```
                TP=0.1333  MASS RAIN=-1

PRINT HYD       ID=34   CODE=1
*
*
**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 312B
**********************************************************************
*

COMPUTE NM HYD  ID=37   HYD NO=312B     DA=0.00171 SQ MI
                PER A=0   PER B=15   PER C=29   PER D=56
                TP=0.1333  MASS RAIN=-1

PRINT HYD       ID=37   CODE=1

***** ADD BASIN 312A TO 312B
ADD HYD              ID=38 HYD NO=DP-13  INFLOW IDS= 34 AND 37
PRINT HYD            ID=38   CODE=5

**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 313
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=75       SLOPE=0.013     K=0.7
                LENGTH=100      SLOPE=0.010     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=39   HYD NO=313      DA=0.00099 SQ MI
                PER A=0   PER B=13  PER C=33   PER D=54
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=39   CODE=1

*****ROUTE DP-8 THROUGH BASIN 313

COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=48 IN   N=0.013
*
ROUTE MCUNGE            ID=40  HYD NO=DP-8Rt  INFLOW ID=33
                        DT=0 HR  LENGTH=130 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=40   CODE=5

***** ADD BASIN 313 TO DP-8Rt TO GET DP-9
ADD HYD              ID=41 HYD NO=DP-9  INFLOW IDS= 39 AND 40
PRINT HYD            ID=41   CODE=5

***** ADD DP-9 TO DP-11 TO GET DP-11A
ADD HYD              ID=42 HYD NO=DP-11A  INFLOW IDS= 30 AND 41
PRINT HYD            ID=42   CODE=5

**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 314
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=300      SLOPE=0.010     K=0.7
                LENGTH=510      SLOPE=0.026     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=43   HYD NO=314      DA=0.00153 SQ MI
                PER A=0   PER B=90  PER C=3   PER D=7
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=43   CODE=1


**********************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 315
**********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=3    ISLOPE=0
                LENGTH=75       SLOPE=0.060     K=0.7
```

```
                LENGTH=60       SLOPE=0.016     K=2.0
                LENGTH=265      SLOPE=0.005     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=44   HYD NO=315      DA=0.00318 SQ MI
                PER A=0   PER B=55  PER C=40  PER D=5
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=44   CODE=1

***** ADD BASIN 314 TO DP-11A TO GET DP-11B
ADD HYD             ID=45 HYD NO=DP-11B  INFLOW IDS= 42 AND 43
PRINT HYD           ID=45   CODE=5

***** ADD BASIN 315 TO DP-11B TO DP-12
ADD HYD             ID=46 HYD NO=DP-12  INFLOW IDS= 44 AND 45
PRINT HYD           ID=46   CODE=5

****ROUTE DP-12 THROUGH RESERVIOR
*
ROUTE RESERVOIR         ID=60  HYD NO=POND3  INFLOW ID=46  CODE=1
                        OUTFLOW (CFS)     STORAGE (AC FT)       ELEV
                        0.01                    0.00            5420.0
                        11.50                   0.28            5420.33
                        32.70                   0.55            5420.66
                        60.00                   0.84            5421.00
                        92.30                   1.16            5421.33
                        129.00                  1.48            5421.66
                        169.70                  1.79            5422.00
                        183.00                  2.15            5422.33
                        188.20                  2.51            5422.66
                        193.40                  2.87            5423.00


COMPUTE RATING CURVE    CID=1   VS NO=1 CODE=-1   SLP=0.020
                        DIA=54 IN   N=0.013
*
ROUTE MCUNGE            ID=61  HYD NO=POND3Rt  INFLOW ID=60
                        DT=0 HR  LENGTH=400 FT
                        NS=0  SLOPE=0.020

PRINT HYD       ID=61   CODE=5

*********************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 316A
*********************************************************************
*

COMPUTE LT TP   LCODE=1 NK=2    ISLOPE=0
                LENGTH=75       SLOPE=0.010     K=1.0
                LENGTH=425      SLOPE=0.010     K=2.0
                KN=0.021        CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=47   HYD NO=316A     DA=0.00400 SQ MI
                PER A=0   PER B=10  PER C=20   PER D=70
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=47   CODE=1

*********************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 316B
*********************************************************************
*

COMPUTE NM HYD  ID=48   HYD NO=316B     DA=0.00066 SQ MI
                PER A=0   PER B=17   PER C=41   PER D=42
                TP=0.1333  MASS RAIN=-1

PRINT HYD       ID=48   CODE=1

*****ROUTE BASIN 316B THROUGH BASIN 323 TO GET 316Rt
COMPUTE RATING CURVE CID=1  VS NO=1  NO SEGS=1
                    MIN ELEV=0 FT  MAX ELEV=1 FT
                    CH SLP=0.011  FP SLP=0.011  N=0.016
                    DIST=15 FT
                    DIST  ELEV    DIST  ELEV    DIST  ELEV   DIST  ELEV
                       0     2      0     0      15     1     15     2
```

```
ROUTE MCUNGE          ID=49  HYD NO=316Rt  INFLOW ID=48
                      DT=0.0 HR  LEN=725 FT
                      NS=0  SLP=0.011

PRINT HYD         ID=49   CODE=5

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 317
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=4     ISLOPE=0
                  LENGTH=300       SLOPE=0.013      K=0.7
                  LENGTH=585       SLOPE=0.039      K=2.0
                  LENGTH=1115      SLOPE=0.012      K=2.0
                  LENGTH=260       SLOPE=0.012      K=3.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=50   HYD NO=317       DA=0.02810 SQ MI
                  PER A=26   PER B=49  PER C=20   PER D=5
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=50   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 318
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
                  LENGTH=100       SLOPE=0.050      K=0.7
                  LENGTH=100       SLOPE=0.050      K=2.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=51   HYD NO=318       DA=0.00095 SQ MI
                  PER A=0   PER B=18  PER C=43   PER D=39
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=51   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 319
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
                  LENGTH=50        SLOPE=0.005      K=1.0
                  LENGTH=450       SLOPE=0.005      K=2.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=52   HYD NO=319       DA=0.00405 SQ MI
                  PER A=0   PER B=0  PER C=30   PER D=70
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=52   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 320
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
                  LENGTH=50        SLOPE=0.005      K=1.0
                  LENGTH=900       SLOPE=0.005      K=2.0
                  KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD    ID=53   HYD NO=320       DA=0.00266 SQ MI
                  PER A=0   PER B=0  PER C=10   PER D=90
                  TP=0.0  MASS RAIN=-1

PRINT HYD         ID=53   CODE=1

**************************************************************************
*       COMPUTE HYD FOR ONSITE SUB-BASIN 321
**************************************************************************
*
COMPUTE LT TP     LCODE=1 NK=2     ISLOPE=0
```

```
                                          100YRE24.DAT
                LENGTH=50        SLOPE=0.011      K=1.0
                LENGTH=700       SLOPE=0.011      K=2.0
                KN=0.021         CENTROID RATIO= 0.0

COMPUTE NM HYD  ID=54   HYD NO=321       DA=0.00184 SQ MI
                PER A=0    PER B=12   PER C=24    PER D=64
                TP=0.0  MASS RAIN=-1

PRINT HYD       ID=54   CODE=1

***** ADD 316Rt TO BASIN 321 TO GET DP-14
ADD HYD              ID=55 HYD NO=DP-14  INFLOW IDS= 49 AND 54
PRINT HYD            ID=55   CODE=5

FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =11/16/2010
INPUT FILE = 100yre24.dat USER NO.= AHYMO-C-9803c01UNMLIB-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
*S**********											
*S											
*S	100 YEAR 6 HOUR STORM - PROPOSED RUNOFF ANALYSIS										
*S	RAINFALL DATA FROM DPM Chapter 22 - ZONE 1										
*S											
*S**********											
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.750
SEDIMENT BULK										PK BF =	1.10
COMPUTE NM HYD	OS-1	-	1	.04948	32.42	1.356	.51368	1.598	1.024	PER IMP=	.00
ROUTE MCUNGE	OS-1Rt	1	2	.04948	32.42	1.356	.51368	1.598	1.024	CCODE =	.0
SEDIMENT BULK										PK BF =	1.00
COMPUTE NM HYD	RW-2	-	3	.00809	19.94	.807	1.86946	1.499	3.851	PER IMP=	60.00
ADD HYD	DP-4	2& 3	4	.05757	48.51	2.162	.70420	1.565	1.317		
COMPUTE NM HYD	OS-6	-	5	.00536	14.63	.650	2.27319	1.499	4.265	PER IMP=	90.00
COMPUTE NM HYD	301.00	-	6	.00335	7.46	.272	1.52062	1.499	3.482	PER IMP=	35.00
ADD HYD	DP-1	5& 6	7	.00871	22.09	.922	1.98374	1.499	3.964		
COMPUTE NM HYD	302.00	-	8	.00614	16.31	.704	2.14854	1.499	4.150	PER IMP=	80.00
COMPUTE NM HYD	303.00	-	9	.00292	7.07	.280	1.79970	1.499	3.782	PER IMP=	55.00
ADD HYD	DP-2	8& 9	10	.00906	23.38	.984	2.03611	1.499	4.031		
ROUTE MCUNGE	DP-1Rt	7	11	.00871	22.09	.922	1.98374	1.499	3.964	CCODE =	.0
ADD HYD	DP-3	10&11	12	.01777	45.47	1.905	2.01044	1.499	3.998		
COMPUTE NM HYD	304.00	-	13	.00484	11.70	.465	1.79969	1.499	3.778	PER IMP=	55.00
ROUTE MCUNGE	DP-4Rt	4	14	.05757	48.51	2.162	.70420	1.565	1.317	CCODE =	.0
ADD HYD	DP-5	13&14	15	.06241	59.63	2.627	.78916	1.532	1.493		
COMPUTE NM HYD	305.00	-	16	.00487	11.34	.450	1.73263	1.499	3.637	PER IMP=	54.00
ROUTE MCUNGE	DP-3Rt	12	17	.01777	44.95	1.905	2.01002	1.499	3.953	CCODE =	.2
ADD HYD	DP-6	16&17	18	.02264	56.29	2.355	1.95035	1.499	3.885		
ROUTE MCUNGE	DP-5Rt	15	19	.06241	59.63	2.627	.78916	1.532	1.493	CCODE =	.0
ADD HYD	DP-6A	18&19	20	.08505	115.25	4.982	1.09826	1.532	2.117		
COMPUTE NM HYD	306.00	-	21	.00473	10.74	.416	1.64843	1.499	3.547	PER IMP=	48.00
ROUTE MCUNGE	DP-6ARt	20	22	.08505	115.25	4.982	1.09826	1.532	2.117	CCODE =	.0
ADD HYD	DP-7	20&21	23	.08978	125.64	5.398	1.12725	1.532	2.187		
COMPUTE NM HYD	307.00	-	24	.00305	7.14	.283	1.73976	1.499	3.658	PER IMP=	54.00
COMPUTE NM HYD	308.00	-	25	.00474	11.69	.473	1.86946	1.499	3.853	PER IMP=	60.00
ROUTE MCUNGE	308Rt	25	26	.00474	11.54	.473	1.86909	1.499	3.805	CCODE =	.2
COMPUTE NM HYD	309.00	-	27	.00338	7.69	.287	1.59039	1.499	3.556	PER IMP=	40.00
COMPUTE NM HYD	310.00	-	28	.00344	8.27	.335	1.82743	1.499	3.755	PER IMP=	60.00
ADD HYD	DP-10	25&28	29	.00818	19.96	.808	1.85179	1.499	3.812		
ADD HYD	DP-11	27&29	30	.01156	27.65	1.095	1.77536	1.499	3.737		
COMPUTE NM HYD	311.00	-	31	.00214	5.07	.202	1.77143	1.499	3.700	PER IMP=	56.00
ROUTE MCUNGE	DP-7Rt	23	32	.08978	125.64	5.398	1.12725	1.532	2.187	CCODE =	.0
ADD HYD	DP-8	31&32	33	.09192	130.53	5.600	1.14225	1.532	2.219		
COMPUTE NM HYD	312A	-	34	.00214	5.35	.223	1.95040	1.499	3.907	PER IMP=	68.00
COMPUTE NM HYD	312B	-	37	.00171	4.02	.160	1.75721	1.499	3.669	PER IMP=	56.00
ADD HYD	DP-13	34&37	38	.00385	9.37	.383	1.86460	1.499	3.801		
COMPUTE NM HYD	313.00	-	39	.00099	2.32	.092	1.73621	1.499	3.666	PER IMP=	54.00
ROUTE MCUNGE	DP-8Rt	33	40	.09192	130.53	5.600	1.14225	1.532	2.219	CCODE =	.0
ADD HYD	DP-9	39&40	41	.09291	132.78	5.691	1.14858	1.532	2.233		

AHYMO.SUM

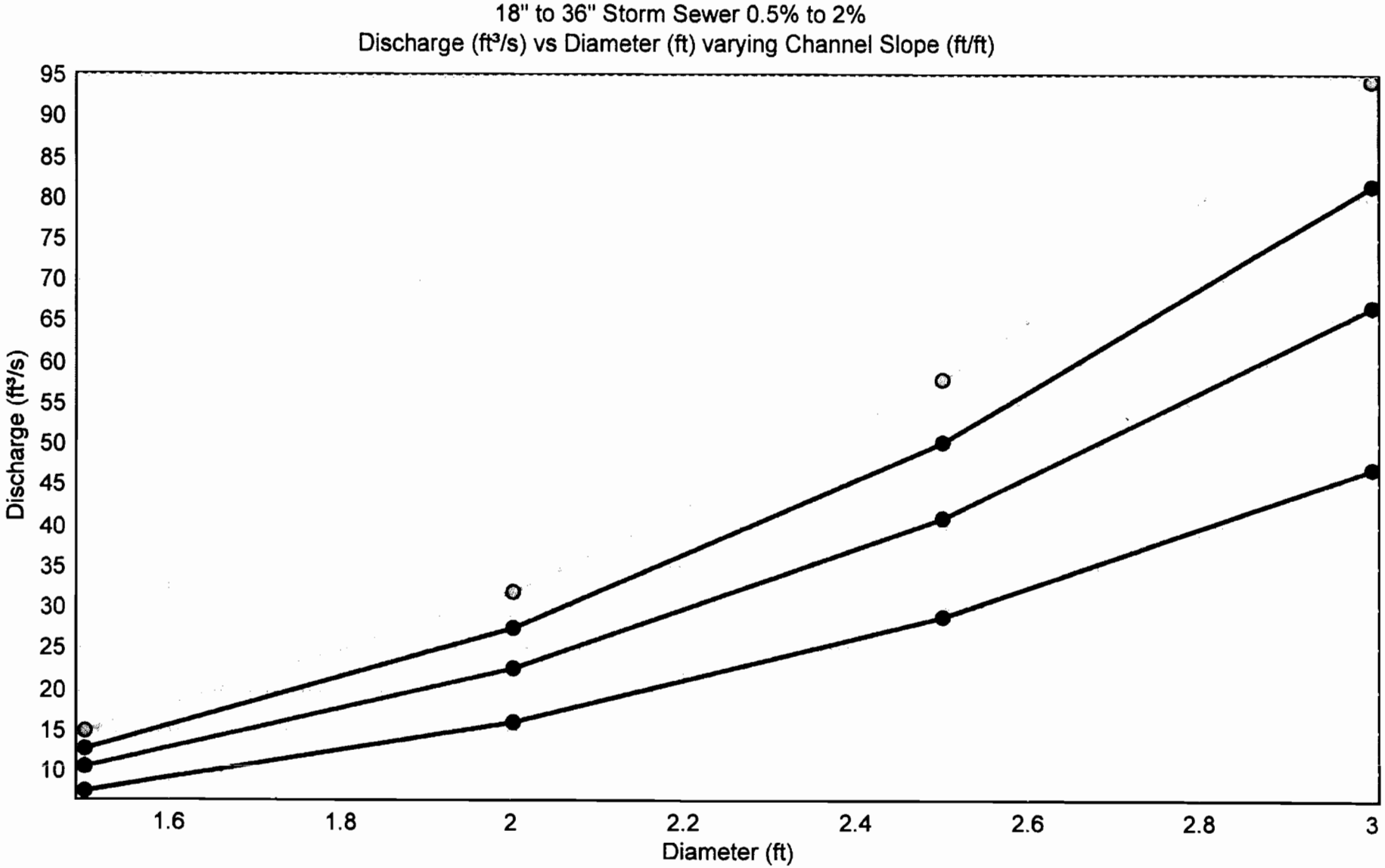
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	DP-11A	30&41	42	.10447	159.44	6.786	1.21793	1.532	2.385	
COMPUTE NM HYD	314.00	-	43	.00153	2.26	.068	.82877	1.499	2.305	PER IMP= 7.00
COMPUTE NM HYD	315.00	-	44	.00318	5.20	.153	.90501	1.499	2.556	PER IMP= 5.00
ADD HYD	DP-11B	42&43	45	.10600	161.69	6.854	1.21231	1.532	2.383	
ADD HYD	DP-12	44&45	46	.10918	166.84	7.007	1.20336	1.532	2.388	
ROUTE RESERVOIR	POND3	46	60	.10918	124.86	6.997	1.20160	1.632	1.787	AC-FT= 1.444
ROUTE MCUNGE	POND3Rt	60	61	.10918	124.86	6.997	1.20160	1.632	1.787	CCODE = .0
COMPUTE NM HYD	316A	-	47	.00400	10.02	.421	1.97131	1.499	3.913	PER IMP= 70.00
COMPUTE NM HYD	316B	-	48	.00066	1.46	.055	1.55369	1.499	3.464	PER IMP= 42.00
ROUTE MCUNGE	316Rt	48	49	.00066	1.47	.055	1.55270	1.565	3.486	CCODE = .2
COMPUTE NM HYD	317.00	-	50	.02810	28.30	1.153	.76959	1.598	1.573	PER IMP= 5.00
COMPUTE NM HYD	318.00	-	51	.00095	2.07	.076	1.50805	1.499	3.400	PER IMP= 39.00
COMPUTE NM HYD	319.00	-	52	.00405	10.38	.434	2.00900	1.499	4.003	PER IMP= 70.00
COMPUTE NM HYD	320.00	-	53	.00266	7.33	.325	2.28809	1.499	4.305	PER IMP= 90.00
COMPUTE NM HYD	321.00	-	54	.00184	4.49	.184	1.88007	1.499	3.813	PER IMP= 64.00
ADD HYD	DP-14	49&54	55	.00250	5.66	.239	1.79364	1.532	3.538	
FINISH										

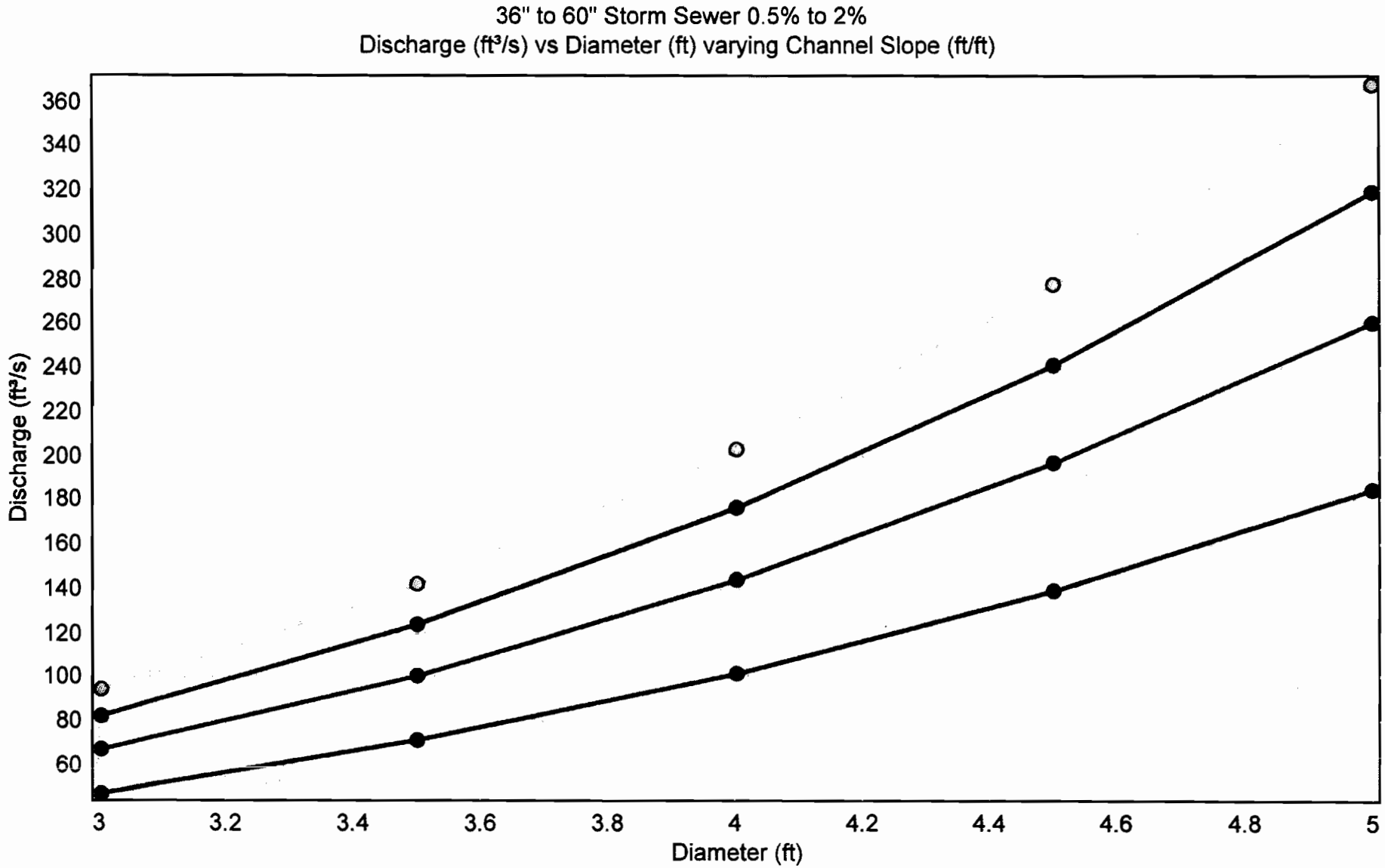
CNM
Central New Mexico
Community College

APPENDIX D

HYDRAULIC ANALYSIS

WILSON
&COMPANY


18" to 36" Storm Sewer 0.5% to 2%
Discharge (ft³/s) vs Diameter (ft) varying Channel Slope (ft/ft)
Discharge (ft³/s)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
1.6
1.8
2
2.2
2.4
2.6
2.8
3
Diameter (ft)


36" to 60" Storm Sewer 0.5% to 2%
Discharge (ft³/s) vs Diameter (ft) varying Channel Slope (ft/ft)
Discharge (ft³/s)
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
3
3.2
3.4
3.6
3.8
4
4.2
4.4
4.6
4.8
5
Diameter (ft)

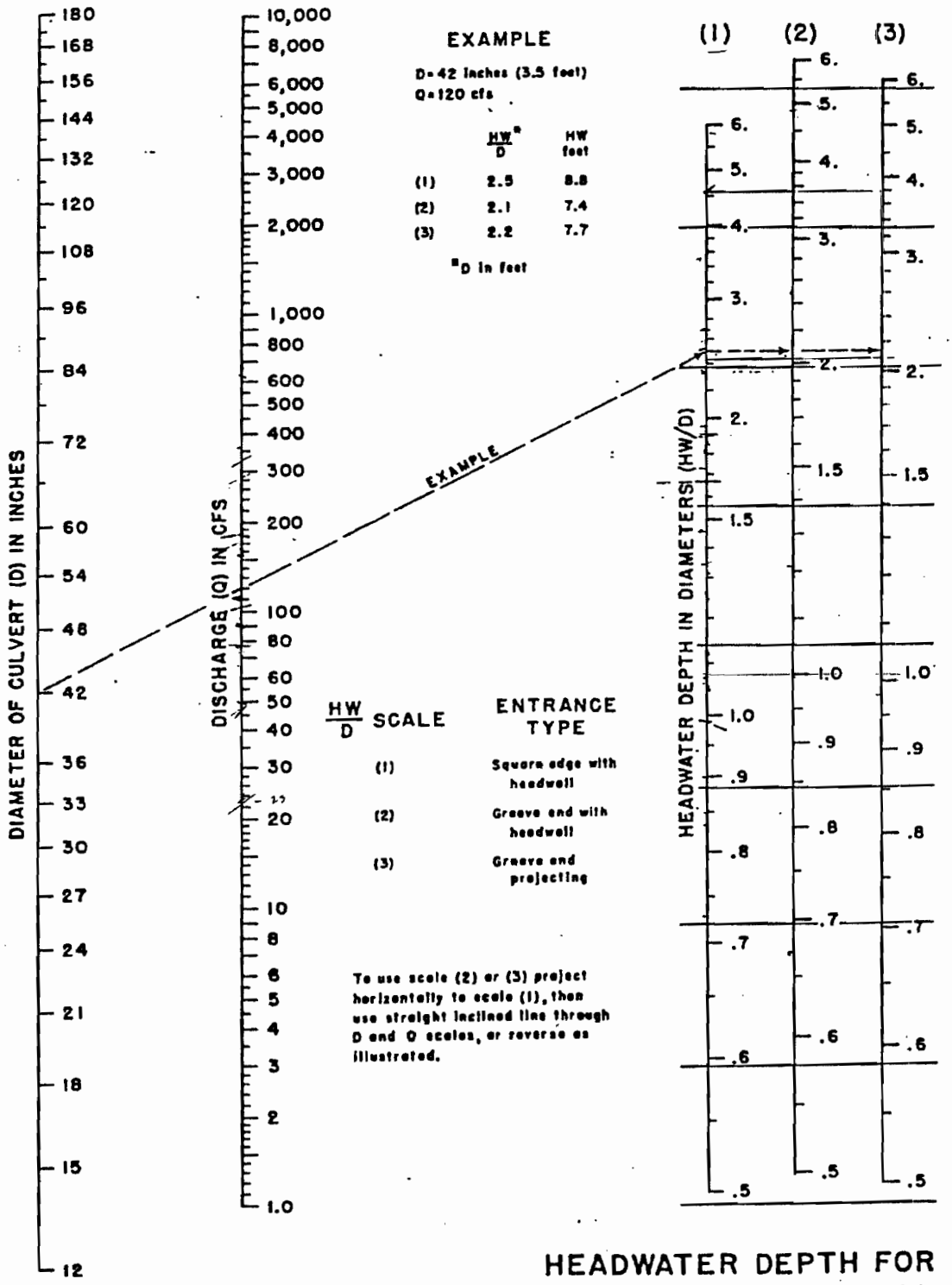
PIPE CAPACITY & ENTRANCE LOSS

PIPE DIA.	AREA S.F.	Q C.F.S	VEL. F.PS.	ENTRANCE LOSS	n	FRICTION SLOPE
18	1.77	12	6.79	1.07	0.013	0.013066
18	1.77	15	8.49	1.68	0.013	0.020415
18	1.77	18	10.19	2.42	0.013	0.029398
18	1.77	21	11.88	3.29	0.013	0.040013
18	1.77	24	13.58	4.30	0.013	0.052262
18	1.77	27	15.28	5.44	0.013	0.066145
18	1.77	30	16.98	6.71	0.013	0.081660
24	3.14	20	6.37	0.94	0.013	0.007810
24	3.14	25	7.96	1.47	0.013	0.012203
24	3.14	30	9.55	2.12	0.013	0.017573
24	3.14	35	11.14	2.89	0.013	0.023918
24	3.14	40	12.73	3.78	0.013	0.031240
24	3.14	45	14.32	4.78	0.013	0.039538
24	3.14	50	15.92	5.90	0.013	0.048813
24	3.14	55	17.51	7.14	0.013	0.059064
24	3.14	60	19.10	8.50	0.013	0.070291
30	4.91	30	6.11	0.87	0.013	0.005337
30	4.91	40	8.15	1.55	0.013	0.009489
30	4.91	50	10.19	2.42	0.013	0.014826
30	4.91	60	12.22	3.48	0.013	0.021350
30	4.91	70	14.26	4.74	0.013	0.029060
30	4.91	80	16.30	6.19	0.013	0.037956
30	4.91	90	18.33	7.83	0.013	0.048037
36	7.07	40	5.66	0.75	0.013	0.003584
36	7.07	50	7.07	1.17	0.013	0.005600
36	7.07	60	8.49	1.68	0.013	0.008064
36	7.07	70	9.90	2.28	0.013	0.010976
36	7.07	80	11.32	2.98	0.013	0.014337
36	7.07	90	12.73	3.78	0.013	0.018145
36	7.07	100	14.15	4.66	0.013	0.022401
36	7.07	110	15.56	5.64	0.013	0.027105
36	7.07	120	16.98	6.71	0.013	0.032257
36	7.07	140	19.81	9.14	0.013	0.043906
42	9.62	60	6.24	0.91	0.013	0.003541
42	9.62	70	7.28	1.23	0.013	0.004819
42	9.62	80	8.32	1.61	0.013	0.006294
42	9.62	90	9.35	2.04	0.013	0.007966
42	9.62	100	10.39	2.52	0.013	0.009835
42	9.62	110	11.43	3.04	0.013	0.011900
42	9.62	120	12.47	3.62	0.013	0.014162
42	9.62	130	13.51	4.25	0.013	0.016621
42	9.62	140	14.55	4.93	0.013	0.019276
42	9.62	150	15.59	5.66	0.013	0.022129
42	9.62	160	16.63	6.44	0.013	0.025177
42	9.62	170	17.67	7.27	0.013	0.028423
42	9.62	180	18.71	8.15	0.013	0.031865

PIPE CAPACITY & ENTRANCE LOSS

PIPE DIA.	AREA S.F.	Q C.F.S	VEL. F.P.S.	ENTRANCE LOSS	n	FRICTION SLOPE
48	12.57	120	9.55	2.12	0.013	0.006942
48	12.57	140	11.14	2.89	0.013	0.009448
48	12.57	160	12.73	3.78	0.013	0.012341
48	12.57	150	11.94	3.32	0.013	0.010846
48	12.57	160	12.73	3.78	0.013	0.012341
48	12.57	170	13.53	4.26	0.013	0.013931
48	12.57	180	14.32	4.78	0.013	0.015619
48	12.57	190	15.12	5.32	0.013	0.017402
48	12.57	200	15.92	5.90	0.013	0.019282
48	12.57	210	16.71	6.50	0.013	0.021259
48	12.57	220	17.51	7.14	0.013	0.023331
48	12.57	230	18.30	7.80	0.013	0.025501
48	12.57	240	19.10	8.50	0.013	0.027766
48	12.57	250	19.89	9.22	0.013	0.030128
48	12.57	260	20.69	9.97	0.013	0.032587
48	12.57	270	21.49	10.75	0.013	0.035142
48	12.57	280	22.28	11.56	0.013	0.037793
54	15.90	180	11.32	2.98	0.013	0.008327
54	15.90	200	12.58	3.68	0.013	0.010280
54	15.90	220	13.83	4.46	0.013	0.012439
54	15.90	240	15.09	5.30	0.013	0.014803
54	15.90	260	16.35	6.22	0.013	0.017373
54	15.90	280	17.61	7.22	0.013	0.020149
54	15.90	300	18.86	8.29	0.013	0.023130
54	15.90	320	20.12	9.43	0.013	0.026317
54	15.90	340	21.38	10.64	0.013	0.029710
60	19.63	220	11.20	2.92	0.013	0.007087
60	19.63	240	12.22	3.48	0.013	0.008434
60	19.63	260	13.24	4.08	0.013	0.009898
60	19.63	280	14.26	4.74	0.013	0.011479
60	19.63	300	15.28	5.44	0.013	0.013178
60	19.63	320	16.30	6.19	0.013	0.014993
60	19.63	340	17.32	6.98	0.013	0.016926
60	19.63	360	18.33	7.83	0.013	0.018976
60	19.63	380	19.35	8.72	0.013	0.021143
60	19.63	400	20.37	9.67	0.013	0.023427
72	28.27	280	9.90	2.28	0.013	0.004336
72	28.27	300	10.61	2.62	0.013	0.004977
72	28.27	320	11.32	2.98	0.013	0.005663
72	28.27	340	12.03	3.37	0.013	0.006393
72	28.27	360	12.73	3.78	0.013	0.007168
72	28.27	380	13.44	4.21	0.013	0.007986
72	28.27	400	14.15	4.66	0.013	0.008849
72	28.27	420	14.85	5.14	0.013	0.009756
72	28.27	440	15.56	5.64	0.013	0.010707
72	28.27	460	16.27	6.17	0.013	0.011703
72	28.27	480	16.98	6.71	0.013	0.012742
72	28.27	500	17.68	7.28	0.013	0.013826
72	28.27	520	18.39	7.88	0.013	0.014955
72	28.27	540	19.10	8.50	0.013	0.016127
72	28.27	560	19.81	9.14	0.013	0.017344
		Q_{full}	V_{full}	$\frac{1.5V^2}{2g}$		S_{full}

CHART 2



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 283
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

FROM: CNM MDF

WILSON &COMPANY

DATE: 8/24/10 FILE

TO: Outlet Structure Design (Pond #3)

SUBJECT:

Floodplain Elev. = 5416.8 @ 100yr (based upon Pinacate Line)

Friction Slope 60" = 0.00436 (using Flowmaster @ 172 cfs

390' @ 0.00436 = 1.70'

5416.8 + 1.70 = 5418.5 @ box

$V = Q/A = 172/19.64 = 8.75$ f/s

$V_h \quad V^2/2g = \frac{8.75^2}{32.2 \times 2} = 1.18$

$1.5 V_h = 1.5 \times 1.18 = 1.78'$ ok

5418.5 + 1.78 = 5420.28

5422.0 − 20.28 = 2.95' 1' FREEBOARD + 1.95' SPILLWAY

Volume Req'd for WQ = 1.38 AC-FT (per model)
@ Elev 5419.82, 5420.0 → (provides 1.51')

Set top of box @ 5420.0

Set inv. of pipe = 5420 − 0.67 − 1.12 − 5.0 = 5413.83

Pool depth 5413.83 + 7.5 = 5421.33

WILSON & COMPANY

FROM: C[illegible] MBF DATE: 8/24/10

TO: [illegible] Design [illegible] FILE:

SUBJECT:

Approximate Flow Reaching Pond #3

$Q_{INFLOW} \approx 170$ cfs

Size box to accomodate [illegible] 170 cfs [illegible] = 83 cf

Size box @ 10' x 10' = 100 sq ft.

* Weir [illegible] = Cd x L x $H^{1.5}$ [illegible] 3.0

* Assume [illegible]

total length = 40' assume 50% [illegible]

Stage storage Assume [illegible] Q [illegible]

Elev	H	Box Qout	Storage	Pipe Qout
20.0	0	0	0	[illegible]
20.33	0.33	11.5	0.28	[illegible]
20.66	0.66	32.7	0.55	19[illegible]
21.00	1.0	60.0	0.84	[illegible]
21.33	1.33	92.3	[illegible]	[illegible]
21.66	[illegible]	129.0	1.48	21[illegible]
22.00	2.0	1[illegible].7	[illegible]	[illegible]
22.33	2.33	2[illegible]3.8	2.15	[illegible]
22.66	2.66	241.3	2.5[illegible]	2[illegible]7.97
23.00	3.00	3[illegible].7	2.8[illegible]	244.2

HIGHER Relationships

FROM: CNM MDF

TO: Outlet Structure (UNC #3)

WILSON & COMPANY

DATE: 8/24/10

FILE:

SUBJECT:

K. Model 6 pack alternated to approx 125 cfs

Reduce on-site pipe to 54"

Floodplain Elev = 5416.8 @ 100yr (Fully backed) from this line

Friction slope 54 = 0.00404

390 @ 0.00404 = 1.58'

5416.2 + 1.58' = 5418.38

V = Q/A = 7.86 (125/15.9)

$V_h = V^2/2g = 0.96'$

5418.32 + 0.96 = 5419.34 < 5420. (minimize w/ Final design)

Can reduce to 54" @ outfall.

Update in AHYMO model, rerun.

Revise invert elev. = 5420 - 0.67 - 5.5/12 - 4.5 = 5414.37

Mid pipe 5414.37 - 2.25 = 5412.12

FROM: CNM MDP

TO: Outlet Structure Design
Pond #3

DATE: 8/24/10

FILE:

SUBJECT:

Review to see if orifice reduction alters storage parameters

Elev	H	Box Q	Pond	Storage
20	0	0	146.8	0
[illegible]	[illegible]	[illegible]	147.5	0.28
[illegible]	0.66	[illegible]	153.9	[illegible]
[illegible]	1.00	60.0	160.3	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	1.16
[illegible]	1.66	[illegible]	171.9	1.48
22.00	2.00	[illegible]	[illegible]	[illegible]
[illegible]	2.33	[illegible]	183.0	[illegible]
22.66	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3.00	[illegible]	193.4	[illegible]

54" OUTFALL SUFFICIENT FROM POND 3

MODEL OUTPUT Q_{IN} = 166.3 (6 HR MODEL)

Q_{OUT} = 124.4 (6 HR MODEL)

STORAGE = 1.43 AC-FT (24 HR MODEL)

APPROX ELEV = 5421.7 = 1.51 AC-FT

↑

Elev should be minimized to allow on-site system to function hydraulically

see HGL calcs.

HIGHER Relationships

WILSON
&COMPANY

FROM: NM MDC
TO: [illegible]

DATE: 8/[illegible]10 FILE
SUBJECT:

[illegible] DP-9

[illegible] 5421.[illegible]

54" [illegible] [illegible] 1590

[illegible]

[illegible]

[illegible] L.P. [illegible] = 23.[illegible]
[illegible] 25 [illegible]

[illegible] 45 [illegible]

45" main = 0.4 × 1.09 = 0.44 + 3[illegible] [illegible] = 0.14
[illegible] inlet = [illegible] 0.05 [illegible]

[illegible] 0.5 [illegible] = 22.5 [illegible] L.P. [illegible] = 24.5
(check Storm Sewer
for Clearance [illegible])

[illegible]

DP9 - DP8 111' to LP-8

21.8[illegible] + 0.44 [illegible] + 111' [illegible] 0.00457 = 22.8[illegible] [illegible] GROUND
= 24.[illegible]

[illegible] 45 [illegible] = 22.8 + 0.14 = 23.24 [illegible] I-II.

WILSON
& COMPANY

FROM: [illegible] MCP

TO: [illegible]

DATE: 8/29/10 FILE

SUBJECT:

[illegible] design [illegible] Phase 1

[illegible] DP-7

[illegible] DP [illegible] 29' to DP-7

$Q = [illegible]$ $f_s = 0.0139$

$23.24 + [illegible] \times 0.0[illegible] = 24.[illegible]$ $V_h = 1.04$

90° bend (54")

$24.[illegible] + 1.0 \times 1.04 = 25.5$ @ DP-7 exist grade = 27.5

Cont. to DP-6 approx 210' DP-7 $Q_{100} = 126$ cfs

$V = Q/A = 126/12.57 = 10'/s$ $V_h = 1.56$

$f_s = 0.0077$

Transistion from 48-54" assume difference in V_h

$25.5 + 50' \times 0.0437 = 25.7 + 0.5'$ (54-48) $= 26.21 + 150' \times 0.0077'$

$= 27.4$ (size remainder of pipe using 0.5% grade) 6-7'/s

FROM: Preliminary Pipe

TO: Clearance Checks

WILSON &COMPANY

DATE: 8/29/10 FILE

SUBJECT:

If Pipe Inv @ Outlet Structure = 16.8 (DP-12)
Approx 210' to DP 9

Grade Pond @ 0.5% = 16.0 x 210 * 0.5% = 17.85

+ 55.0' to Road @ 0.005% = 0.275 = 17.85 + 0.28
= 18.13 " check top of Pipe for CLEARANCE

18.13 + 4.5 + 5.5/12 = 23.08 + 1.5 CLR = 24.5' @ ROAD.

(may need to fill buildings behind basin 313)

L.P Road mid 24.5' may need to use elliptical pipe.

Trans to DP-8 111' @ 0.005 = 0.56

23.08 + 0.56 = 23.64 + 1.5 = 25.2 MIN GRADE @ DP-8

FROM: CNM MDP

WILSON &COMPANY

DATE: 8/24/10

TO:

FILE:

SUBJECT: Preliminary Pond Sizing For Pond 4 (Ph II - Building)

Area to be detain to match planned discharge.

* Pond will likely need to be drained by a pipe system, due to vertical constraints

Assume Area to be ponded = 41,145 Ft²

Assume usage by previous study B-C will use B to be conservative

Intensity from 20yr I = 4.70 100 yr. - Table A-10
Rational Coefficient - B = 0.43 100 yr. - Table A-11

$Q_{100} = 0.43 \times 4.70 \times (41,145/43560) = 1.91$

Allowable discharge ≈ 1.9cfs

Approx Developed Q's using rational method,

Revised Basin size for developed condition (to Pond)

Contr. to Pond = 76,305 / 43560 = 1.75 AC

Building = 34,005 / 43560 = 0.78 AC

HIGHER Relationships

FROM: CNM MDP

TO: Pond 4 Prel. Sizing

WILSON &COMPANY

DATE: 8/24/10

FILE:

SUBJECT:

Remaining Area = 1.75 - 0.78 = 0.97 Ac

Assumed Usage A = 0

B = 15% = 0.1455 / 1.75 = 0.083 ≈ 8%.

C = 45% = 0.4365 / 1.75 = 0.249 ≈ 25%.

D = 40% = 0.388

Total imp. %

I = 0.388 + 0.78 = 1.168 / 1.75 = 0.667 = 67%.

Developed Flow using RATIONAL

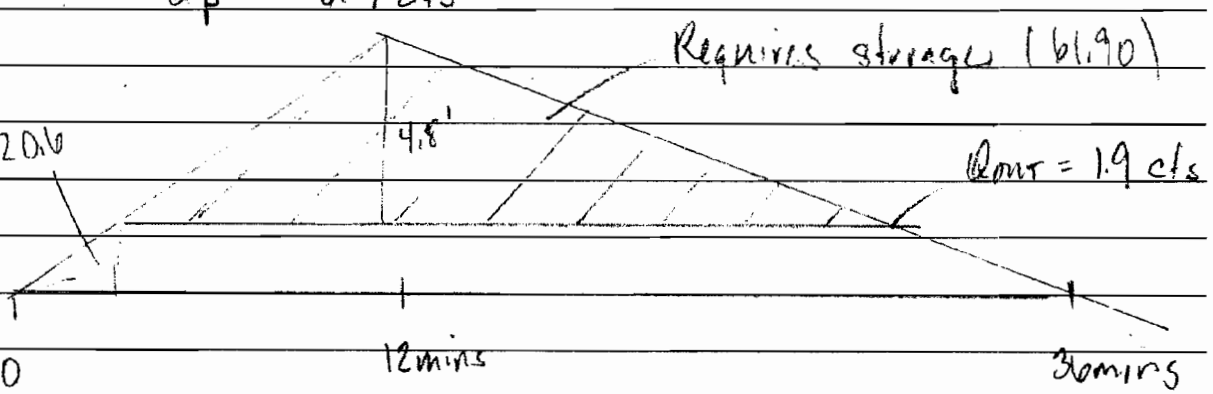
Weighted C = (0.)0.27 + (0.08)0.43 + (0.25)0.61 + (0.67)(0.93)

= 0.81

$Q_{100} = C I A$ = 0.81 x 4.70 x 1.75 = 6.66 cfs

Q_{in} = 6.66 cfs Q_{out} = 1.9 cfs

Q_p = 6.7 cfs



HIGHER Relationships

FROM: CNM MDP

TO: POND 4 PERIM SIZING

WILSON & COMPANY

DATE: 8/24/10

FILE:

SUBJECT:

$V_1 = (6.7 \times 12 \times 0.5) + (6.7 \times 24 \times 0.5) = 120.6$

$\frac{6.7}{4.8} = \frac{12}{x}$ $x = 8.59$ $2x = 17.19$

$V_2 = (4.8 \times 8.59 \times 0.5) + (4.8 \times 17.19 \times 0.5) = 61.9$ (rqd storage)

$V_2 = 4.8 \times 8.59 \times 0.5 \times 60 + 4.8 \times 17.19 \times 0.5 \times 60$

$V_{TOTAL} = 3713.9 = 3715$ cuft $= 0.0852$ AC-FT

Assume: 2' depth pond $= 3715/2 = 1857.5$ sq ft

30 wide $= 1857.5/30'$ @ 1' depth $= 62'$

min head should be req'd to pass flow $< 0.5'$
add 1' freeboard

Total depth $= 2 + 1.5 = 3.5'$ approx surface elevation $21.0 - 3.5 = 17.5$

Elevation of inlet grate per Phase I plans $= 15.74$
invert $= 10.24$

datum difference $+2$ invert 17.24 will drain if hydraulic allow.

HIGHER Relationships

FROM: CNMI MDP

TO: POND 4 PREM SIZING

WILSON &COMPANY

DATE: 8/24/10

FILE:

SUBJECT:

ESTIMATE OUTLET DISCHARGE

ORIFICE EQN = $Q = C_d A \sqrt{2gh}$

$1.9 = 0.6(A)\sqrt{2 \cdot 32.2 \cdot 2}$

$A = 0.279$

STAGE STORAGE $Q = 0.6(0.279)\sqrt{2 \cdot 32.2 \cdot 2}$

h	Q_{OUT}	STORAGE	
0	0.01	0	
0.5	0.95	0.016	Storage Calculated in Excel Worksheet
1.0	1.34	0.032	
1.5	1.65	0.060	
2.0	1.9	0.089	
2.5	2.1	0.133	

MODEL BASIN IN AHYMO with Stage Storage Outflow

Results of AHYMO indicate a min of 0.109 acre-ft required

Lower pond bottom, recalc orifice and rerun stage storage

HIGHER Relationships

FROM: CNM MDP

TO: POND 4 PREL. SIZING

WILSON & COMPANY

DATE: 8/24/10

FILE:

SUBJECT:

Req 0.11 AC-FT @ 2.0' depth (Per AHYMO)

0.11 x 43560 = 4792 sq ft

Assume 2' pond depth 4792/2' = 2396.

30' wide = 2396 / 30 = 80' (Approx 30' x 80')

set @ 1' depth, Recalc Areas in CAD

STAGE STORAGE

Elev	h	Qout	Storage
17.0	0	0.01	0
17.5	0.5	0.95	0.021
18.0	1.0	1.34	0.042
18.5	1.5	1.65	0.078
19.0	2.0	1.9	0.113
19.5	2.5	2.1	0.168

PROVIDE 0.12 AC-FOOT DET. POND TO REDUCE RUNOFF REACHING EXISTING INLET 'M' AT RATE SPECIFIED ON PHASE I DRAINAGE MAP OF 5.3 CFS.

PEAK DISCHARGE TO PHASE II FROM PROP. DETENTION POND TO MEET THIS CONDITION IS LIMITED TO APPROXIMATELY 1.7 CFS

IT IS IMPORTANT TO NOTE THAT EVALUATION OF THE EXISTING CONDITIONS AT THIS LOCATION PRODUCES A FLOW RATE TO THE INLET THAT IS GREATER THAN PREVIOUSLY STUDIED (6.2 CFS VS. 5.3 CFS)

HIGHER Relationships

Central New Mexico Community College Master Plan
Watershed Summary - Contributing to Pond 3
8/14/2020

Basins reaching Proposed Water Quality Pond

Basin ID	Basin Area (ac)	Percent Impervious	Basin Impervious Area (ac)	% Imp.
OS-1*	31.67	48.00	15.20	
RW-2	5.18	60.00	3.11	
OS-6	3.43	90.00	3.09	
301	2.14	35.00	0.75	
302	3.93	80.00	3.14	
303	1.87	35.00	0.65	
304	3.10	55.00	1.71	
305	3.12	54.00	1.68	
306	3.33	48.00	1.60	
308	3.03	60.00	1.82	
309	2.16	60.00	1.30	
310	2.20	60.00	1.32	
311	2.12	56.00	1.19	
313	0.63	54.00	0.34	
314	0.98	7.00	0.07	
315	2.04	5.00	0.10	
Sub-total	70.93		37.06	0.52

Water Quality Storm Even Runoff Rate and Volume**

% Imp.	Runoff Depth (inches)	Runoff Rate (cfs/ac)	Runoff Volume (cubic feet / acre)
0.00	0.00	0.00	0
20	0.09	0.5	327
40	0.18	0.8	653
60	0.27	1.20	980
80	0.36	1.35	1037
100	0.46	1.50	1670

Interpolation of 53% yields Runoff Volume of 865.55

Required Volume (cf) 61394
Required Volume (ac-ft) 1.41

* Assumed 48% impervious (D) taken from Albuquerque TVEI Mater Drainage Plan North West Site report
** Table taken from Alb. DC Chapter 22, page 109 Table 2

Note: Runoff from Basins 307, 312, 316, 317, 318, 319, 320 are not routed through the WQ Pond.

CENTRAL NEW MEXICO COMM. COLLEGE
MASTER DRAINAGE PLAN
(Pond Volume Calculation)

WQ POND 3

Elevation	SF	CF	Storage AF	Storage Sum
5417	0.00			0
5418	19,151.00	9,575.50	0.22	0.22
5419	29,618.00	24,384.50	0.56	0.78
5420	34,201.00	31,909.50	0.73	1.51
5421	39,010.00	36,605.50	0.84	2.35
5422	44,051.00	41,530.50	0.95	3.31
5423	49,335.00	46,693.00	1.07	4.38

Total = 190,699 CF

Total = 4.38 Ac-ft

At Elevation 5419.9, the Storage is 1.44 Ac-ft.
#N/A

Calculated by: DLM

Date: 8/16/2010

Checked by: _____

CENTRAL NEW MEXICO COMM. COLLEGE
MASTER DRAINAGE PLAN
(Pond Volume Calculation)

STORE ABOVE WQ

Elevation	SF	CF	Storage AF	Storage Sum
5420	34,201.00			0
5421	39,010.00	36,605.50	0.84	0.84
5422	44,051.00	41,530.50	0.95	1.79
5423	49,335.00	46,693.00	1.07	2.87

Total = 124,829 CF

Total = 2.87 Ac-ft

At Elevation 5421.63, the Storage is 1.44 Ac-ft.
#N/A

Calculated by: DLM

Date: 8/16/2010

Checked by: _____

CENTRAL NEW MEXICO COMM. COLLEGE
MASTER DRAINAGE PLAN
(Pond Volume Calculation)

POND 4

Elevation	SF	CF	Storage AF	Storage Sum
5417	1,224.00			0
5418	2,400.00	1,812.00	0.04	0.04
5419	3,864.00	3,132.00	0.07	0.11
5420	5,616.00	4,740.00	0.11	0.22

Total = 9,684 CF

Total = 0.22 Ac-ft

At Elevation 5419.06, the Storage is 0.12 Ac-ft.
#N/A

Calculated by: DLM

Date: 8/16/2010

Checked by: _____

FROM: CNM MOP

TO: MISC. INFO. DISCHARGE TO PHASE I,

WILSON & COMPANY

DATE: 8/23/10

FILE:

SUBJECT:

EXISTING STORM SEPTOR SYSTEM

* PER PHASE I REPORT, MODEL 4800 WAS FOUND TO TREAT 78% OF THE SEDIMENT FROM A 12.4 AC. PARKING LOT
  * (ALBUQUERQUE TVI WEST SIDE INST. FACILITY, by Custer Basarich, LTD. 03-2002)
* 7.4 AC CONSTRUCTED WITH PHASE I

ADDITION AREA MASTER PLANNED TO CONTRIBUTE TO SYSTEM.

1.47 AC BASIN 312A
0.42 AC BASIN 316A
1.89 ≈ 1.9 AC

7.4 AC + 1.9 AC = 9.3 AC < 12.4 AC used to size unit.

Treatment may be feasible with existing unit inspection and additional analysis with Phase III development should be conducted.

HIGHER Relationships

FROM: CMN MOP

TO: MISC INFO, VERIFY REDIRECTION OF TEMP SWALE FEASIBLE.

WILSON &COMPANY

DATE: 8/25/10

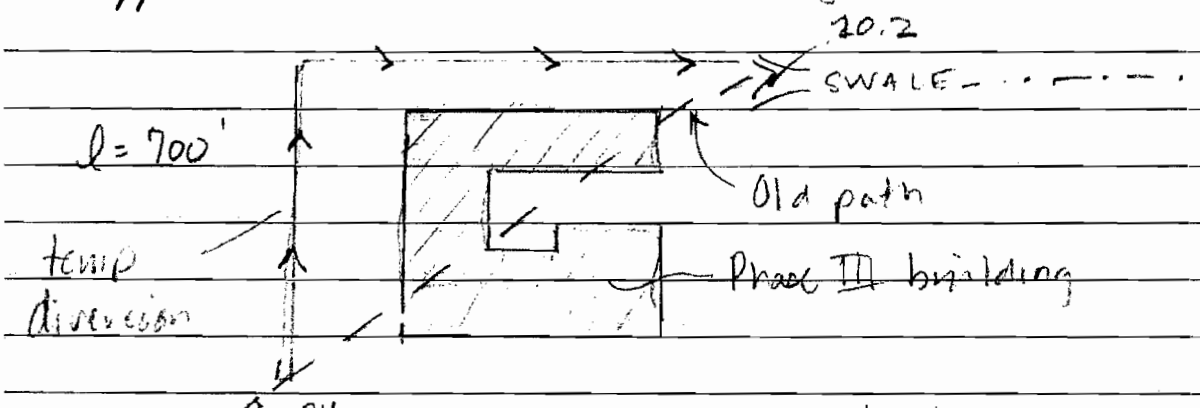
FILE:

SUBJECT:

With the development of the Phase III Building the existing 8'w x 2'd swale will need to be relocated.

Elevation at Phase I/II bndy = 20.2
Elevation South of Phase III building = 24.0

approx distance around building



channel slope = $\frac{24.0 - 20.2}{700}$

≈ 0.5%

Westside Campus Phase II drainage plan indicates approx 29cfs was to be directed to swale, and flow with 1' of freeboard.

Conservatively size for 29cfs

Flowmaster X-section

Input = n = 0.030, S = 0.5% SS = 3:1 BW = 8.0'
Q = 29cfs

Output: Normal depth = 0.94' = 1' freeboard if 2' deep.

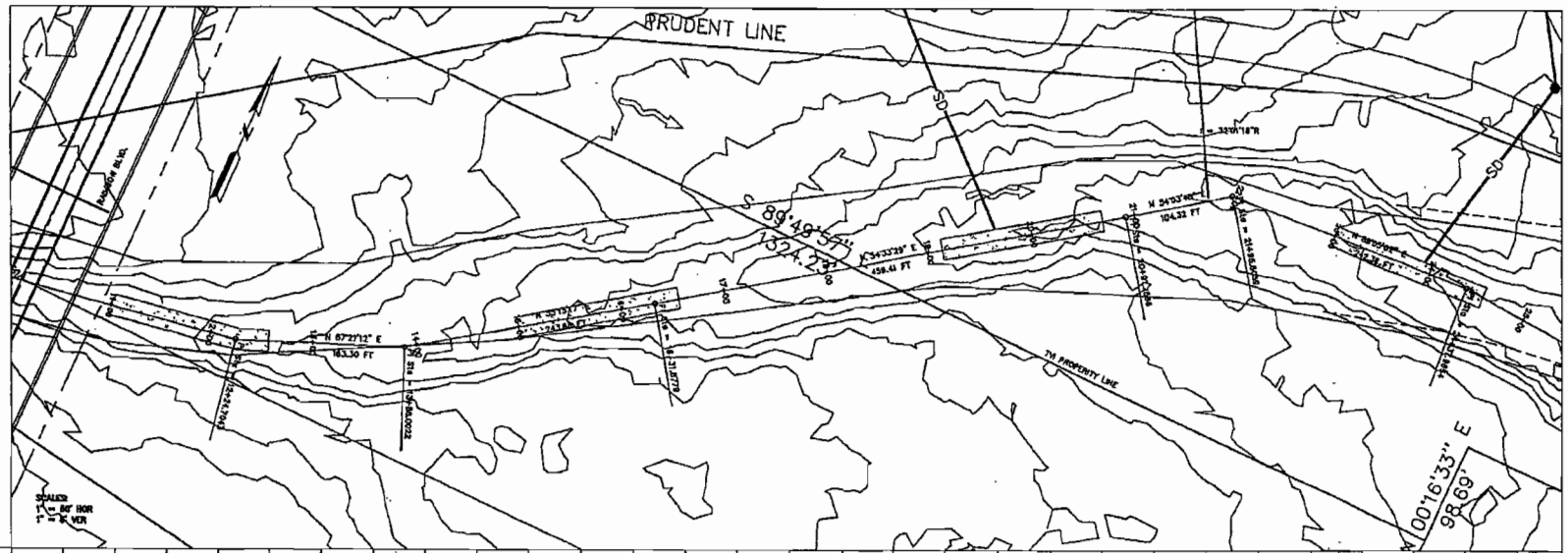
HIGHER Relationships

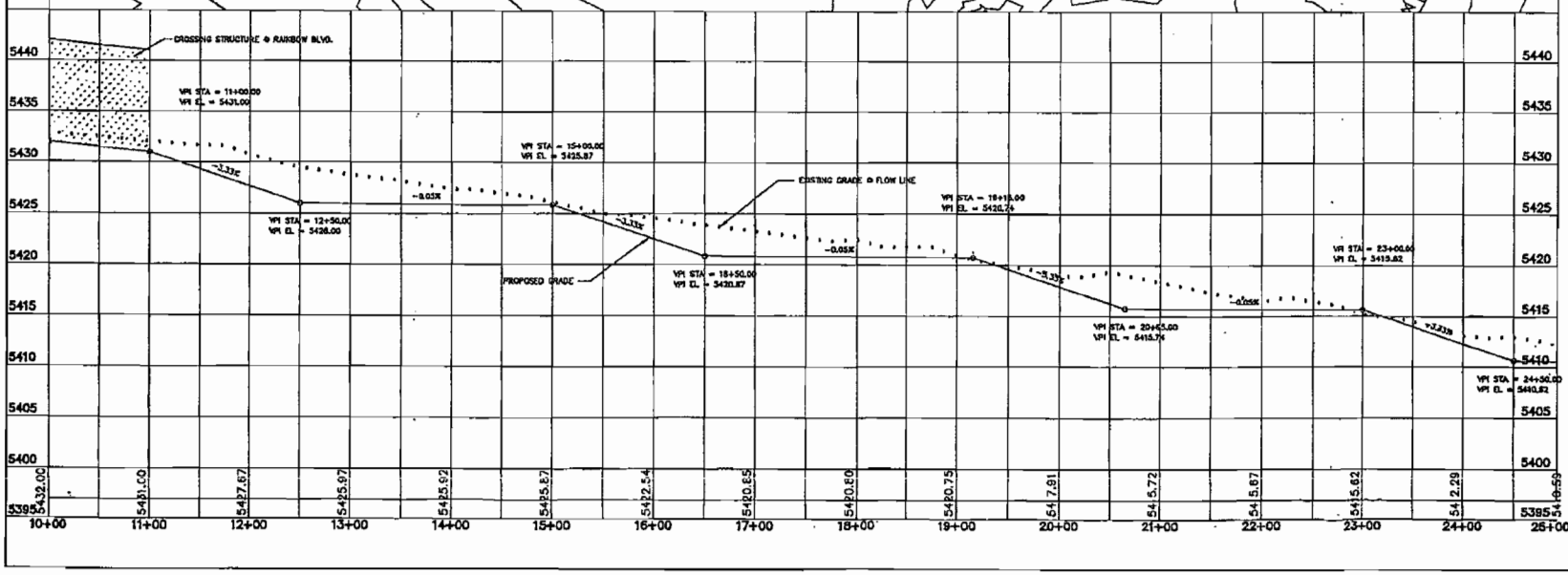
CNM
Central New Mexico
Community College

APPENDIX E

DRAINAGE MAPS

WILSON
&COMPANY





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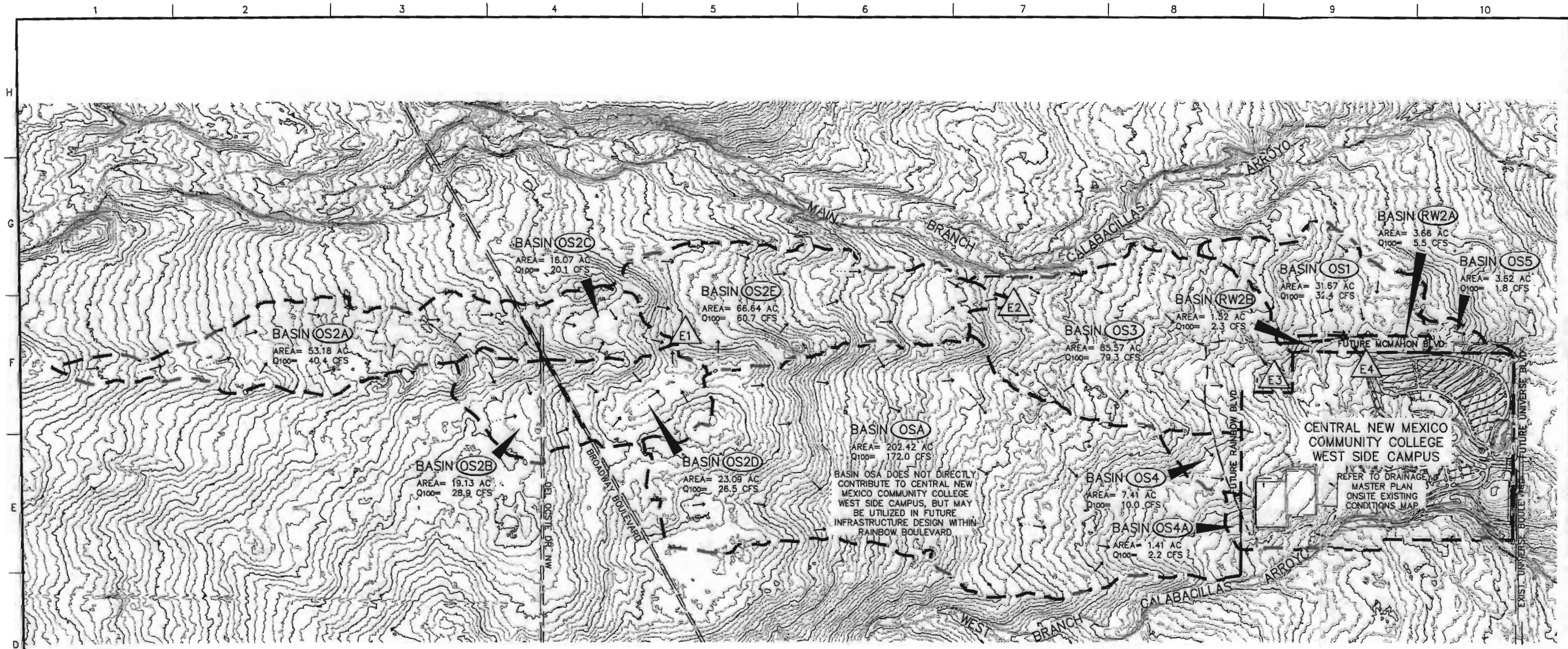
ALBUQUERQUE TVI
NORTHWEST SITE

MASTER DRAINAGE PLAN
PLAN & PROFILE

DRAWN BY	DESIGNED BY	CHECKED BY
P.R.	K.B.	J.A.A.

DATE: OCT. 2001
SHEET: Sta 10+00–25+00



DESIGN POINT SUMMARY		
DESIGN PT	Q 100	VOL100
	6-HR	24-HR
	(CFS)	(AC-FT)
E1	87.8	4.73
E2	110.4	7.56
E3	126.3	11.21
E4	36.9	1.50

500 250 0 500 1000
SCALE 1" = 1000'

EXISTING INDEX CONTOUR
EXISTING NOMINAL CONTOUR
BASIN BOUNDARY
DIRECTION OF DRAINAGE
BASIN IDENTIFIER → BASIN (310)
AREA IN ACRES → AREA= 1.47 AC, Q100= 5.0 ← 100-YR RUNOFF IN CFS
PEAK FLOW ANALYSIS POINT (11)

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PHONE: 505-898-8021
FAX: 505-898-8501
www.wilsonco.com

CONSULTANTS

SEAL
XX% SUBMITTAL NOT FOR CONSTRUCTION

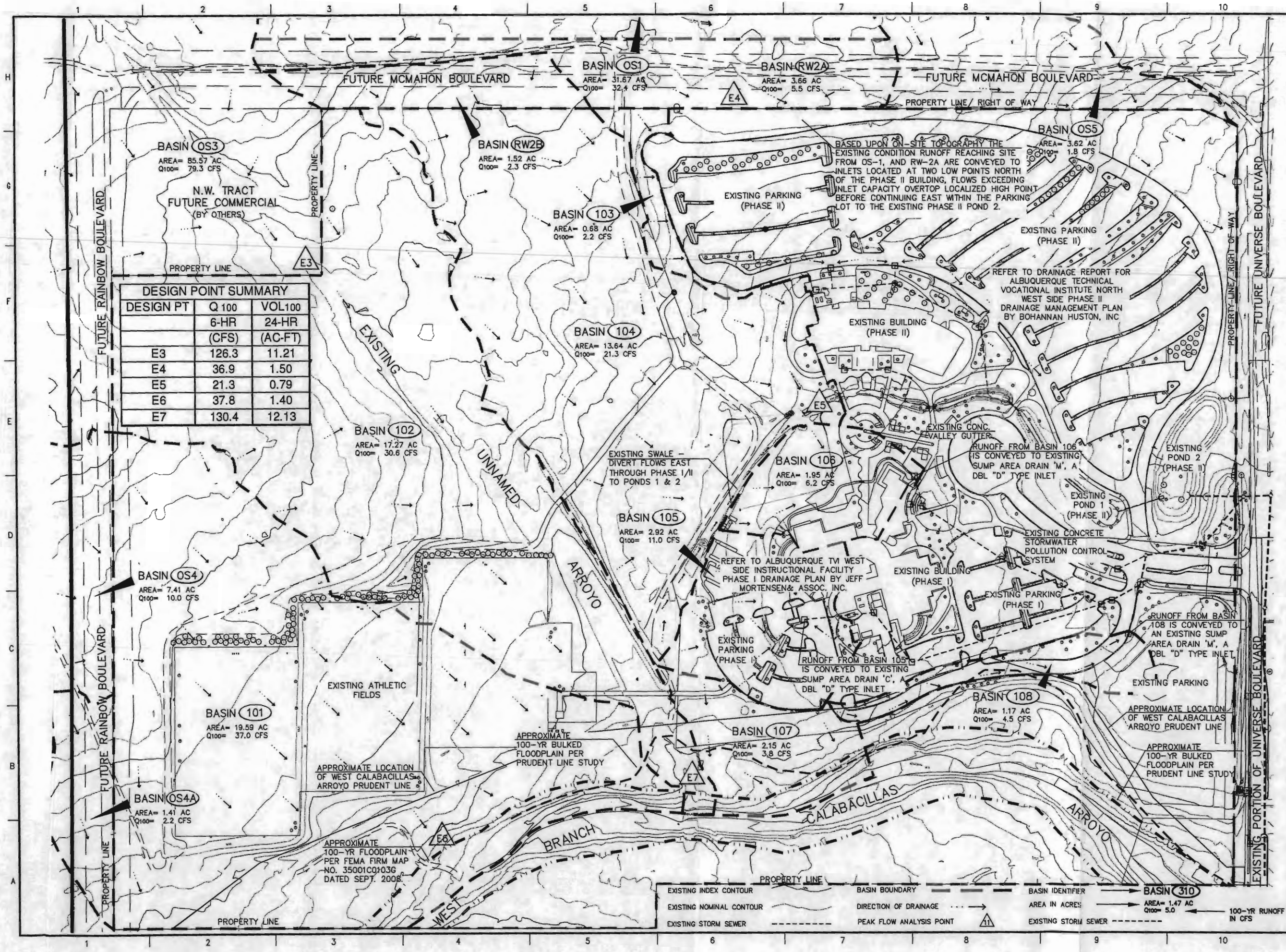
PROJECT NAME
CENTRAL NEW MEXICO COMMUNITY COLLEGE WESTSIDE CAMPUS BERNALILLO COUNTY, NM

DESCRIPTION	DATE	MARK

PROJECT NO:
DESIGNED BY: DLM
DRAWN BY: DLM
CHECKED BY: VSF
DATE:

SHEET TITLE
MASTER DRAINAGE PLAN OFFSITE EXISTING CONDITIONS MAP

SHEET NO:
DP-1
1 of 1



DESIGN POINT SUMMARY		
DESIGN PT	Q 100	VOL100
	6-HR	24-HR
	(CFS)	(AC-FT)
E3	126.3	11.21
E4	36.9	1.50
E5	21.3	0.79
E6	37.8	1.40
E7	130.4	12.13

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PROJECT NAME

CENTRAL NEW MEXICO COMMUNITY COLLEGE WESTSIDE CAMPUS BERNALILLO COUNTY, NM

MARK	DATE	DESCRIPTION

PROJECT NO:	
DESIGNED BY:	DLM
DRAWN BY:	DLM
CHECKED BY:	VSF
DATE:	

SHEET TITLE

DRAINAGE MASTER PLAN ONSITE EXISTING CONDITIONS MAP

SHEET NO:

DP-2

1 of 1

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DESIGN PT	Q 100 6-HR (CFS)	VOL100 24-HR (AC-FT)
1	22.1	0.95
2	23.4	1.01
3	45.5	1.96
4	48.5	2.18
5	59.6	2.66
6	56.3	2.43
7	125.7	5.59
8	130.5	5.60
9	132.8	6.04
10	20.0	0.83
11	27.7	1.12
12	166.8	7.01
13	9.37	0.38
14	5.7	0.25

DESIGN POINT SUMMARY

MARK	DATE	DESCRIPTION

PROJECT NAME

CENTRAL NEW MEXICO COMMUNITY COLLEGE
WESTSIDE CAMPUS
BERNALILLO COUNTY, NM

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PROJECT NO:
DESIGNED BY: DLM
DRAWN BY: DLM
CHECKED BY: VSF
DATE:
SHEET TITLE

DRAINAGE MASTER PLAN ONSITE FINAL CONDITIONS MAP

SHEET NO:

DP-3

1 of 1

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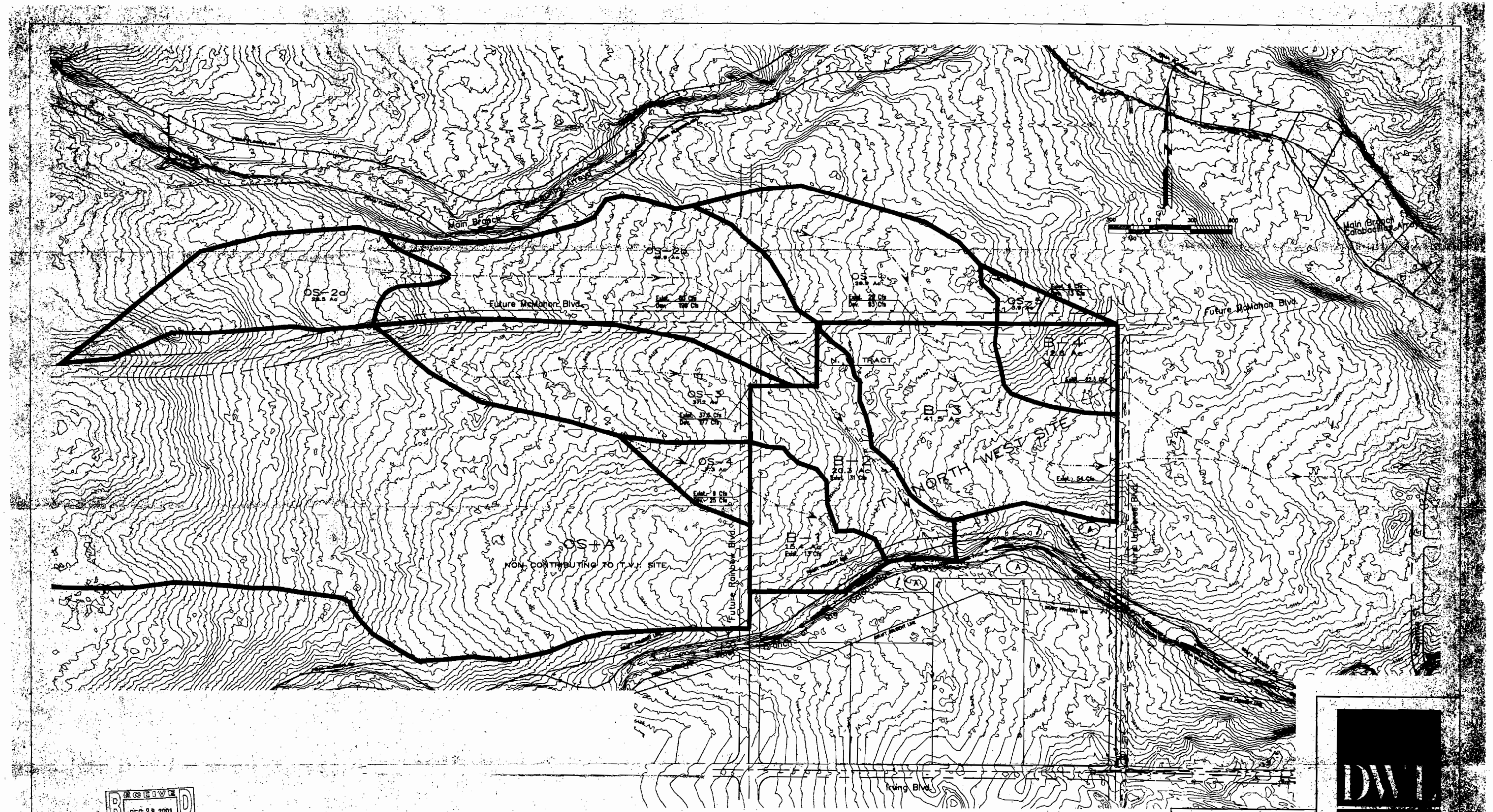
Central New Mexico
Community College

APPENDIX F

SUPPORTING DOCUMENTATION

TVI MASTER DRAINAGE PLAN DOCUMENTS
PRUDENT LINE STUDY DOCUMENTS
PRUDENT LINE RECORDED EASEMENT

WILSON
&COMPANY



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DEC 28 2001
HYDROLOGY SECTION

EXISTING CONDITIONS DRAINAGE BASINS

SCALE: 1" = 300'

GENERAL NOTES

1. SEE FIGURE 1 OF REPORT FOR VICINITY MAP
2. LOWER OFFSITE BASIN BOUNDARIES AND UPPER ONSITE BASIN BOUNDARIES ARE SITE PROPERTY LINE
3. FEMA FLOODPLAIN BASED ON LATEST MAPPING AVAILABLE FROM BERNALILLO COUNTY PUBLIC WORKS DEPARTMENT

KEYED NOTE

(A) AREA DRAINS DIRECTLY TO WEST BRANCH OF THE CALABACILLAS ARROYO

LEGEND

- EXISTING FLOW PATH
- SITE BOUNDARY
- DRAINAGE BASIN BOUNDARY
- FEMA FLOOD PLAIN
- DRAFT PRUDENT LINE
- PROPOSED DROP STRUCTURES
- EXISTING DRAINAGE

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ALBUQUERQUE TVI
NORTHWEST SITE

MASTER DRAINAGE PLAN
EXISTING CONDITIONS
DRAINAGE BASINS

DRAWN BY:	DESIGNED BY:	CHECKED BY:
P.R.	K.B.	J.A.A.

DATE: OCT. 2001 SHEET: FIGURE 2

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OFFSITE AREA OS-1 Exist. 29. cfs Dev. 93 cfs

OFFSITE AREA OS-5 Exist. 5 cfs Dev. 13 cfs

McMAHON BLVD

OFFSITE AREA OS-2 Exist. 60 cfs Dev. 196 cfs

OFFSITE AREA OS-3 Exist. 37.8 cfs Dev. 177 cfs

OFFSITE AREA OS-4 Exist. 9 cfs Dev. 25 cfs

RAINBOW BLVD.

UNIVERSE BLVD.

N.W. TRACT

N

SCALE 1"=200'

PORTION OF B-3 30.3 AC

B-4 17.5 AC

B-2 20.8 AC

B-1 15.4 AC

PAVING LIMITS

FF= 5415 - 5418

PHASE I

PROPOSED OFFSITE STORM DRAIN 66" R.C.P. @ 0.7%

CALABACILLAS ARROYO

PRUDENT LINE

UNIVERSE BLVD/ARROYO CROSSING STRUCTURE

KEYED NOTES

1. DO NOT DISTURB AREA
2. INTERIM DIVERSION SWALE
3. INTERIM DESILTING BASIN
4. AMAFCA APPROVED WATER QUALITY ENHANCEMENT FACILITY
5. ROOF DRAINS
6. STORM DRAIN INLETS

LEGEND

- HISTORIC FLOW
- DESIGN FLOW
- WATER BLOCK
- SD — STORM DRAIN
- BASIN BOUNDARY
- PHASE BOUNDARY
- B-4 ONSITE BASIN ID

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MASTER DRAINAGE PLAN
PHASE I

DRAWN BY:	DESIGNED BY:	CHECKED BY:
P.R.	K.B.	J.A.A.
DATE: OCT. 2001	SHEET: PLATE 1	

OFFSITE AREA OS-1 Exist. 29. cfs Dev. 93 cfs

OFFSITE AREA OS-5 Exist. 5 cfs Dev. 13 cfs

McMAHON BLVD

OFFSITE AREA OS-2 Exist. 80 cfs Dev. 196 cfs

OFFSITE AREA OS-3 Exist. 37.8 cfs Dev. 177 cfs

RAINBOW BLVD.

Exist. 9 cfs Dev. 25 cfs OFFSITE AREA OS-4

N.W. TRACT

N

SCALE 1"=200'

PORTION OF B-3 30.3 AC

B-4 17.5 AC

B-2 20.8 AC

B-1 15.4 AC

PHASE I

PAVING LIMITS

PROPOSED OFFSITE STORM DRAIN 66" R.C.P. @ 0.7%

UNIVERSE BLVD.

CALABACILLAS ARROYO

PRUDENT LINE

UNIVERSE BLVD/ARROYO CROSSING STRUCTURE

KEYED NOTES

1. DO NOT DISTURB AREA
2. INTERIM DIVERSION SWALE
3. INTERIM DESILTING BASIN
4. AMAFCA APPROVED WATER QUALITY ENHANCEMENT FACILITY
5. ROOF DRAINS
6. STORM DRAIN INLETS

LEGEND

- HISTORIC FLOW
- DESIGN FLOW
- WATER BLOCK
- SD — STORM DRAIN
- BASIN BOUNDARY
- PHASE BOUNDARY
- B-4 ONSITE BASIN ID

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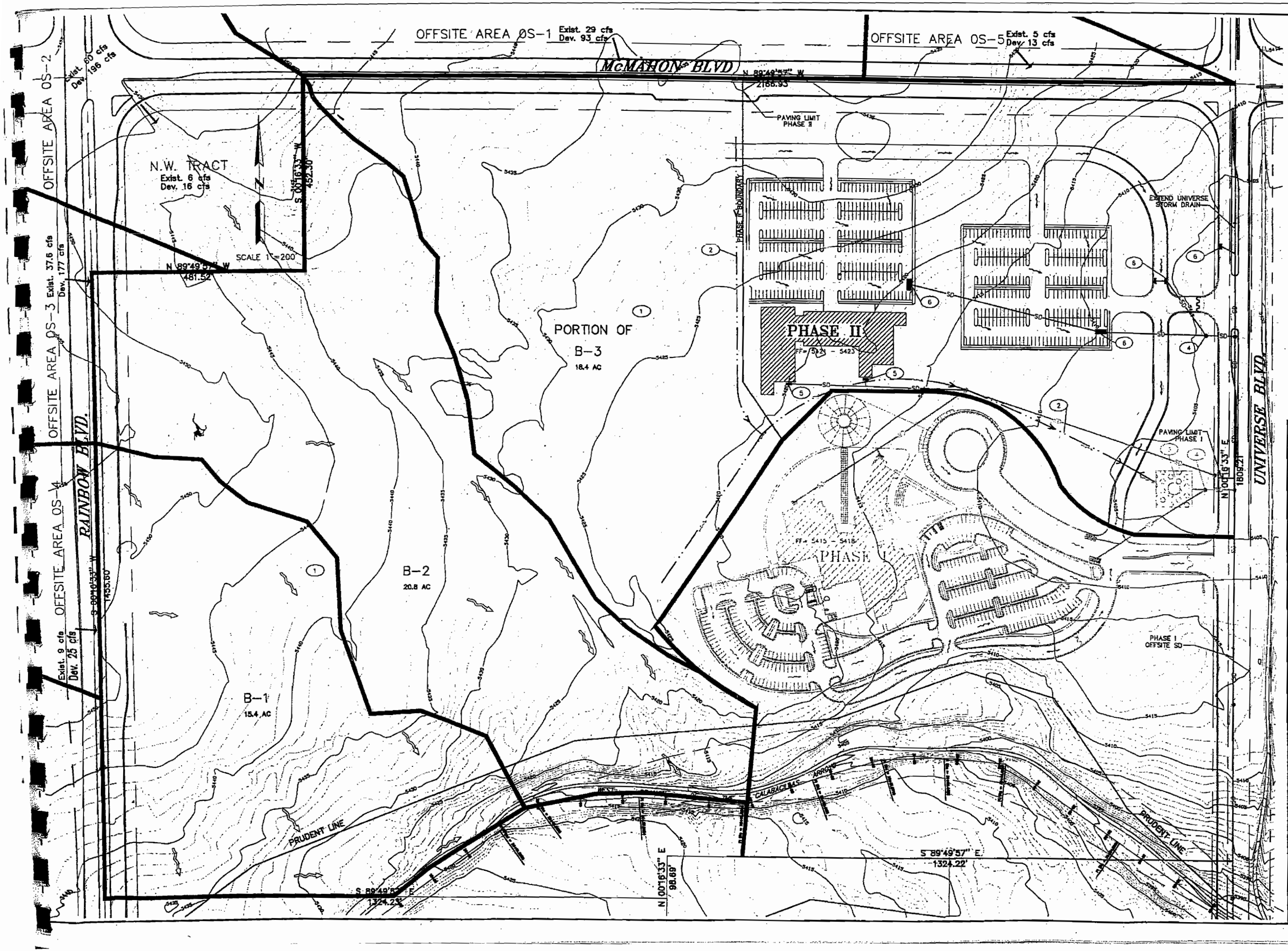
MASTER DRAINAGE PLAN
PHASE I

DRAWN BY:	DESIGNED BY:	CHECKED BY:
P.R.	K.B.	J.A.A.
DATE: OCT. 2001	SHEET: PLATE 1	



KEYED NOTES

1. DO NOT DISTURB AREA
2. INTERIM DIVERSION SWALE
3. INTERIM DESILTING BASIN
4. AMAFCA APPROVED WATER QUALITY ENHANCEMENT FACILITY
5. ROOF DRAINS
6. STORM DRAIN INLETS

LEGEND

- HISTORIC FLOW
- DESIGN FLOW
- WATER BLOCK
- SD — STORM DRAIN
- BASIN BOUNDARY
- PHASE BOUNDARY
- B-4 ON SITE BASIN ID

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ALBUQUERQUE TVI
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MASTER DRAINAGE PLAN
PHASE II

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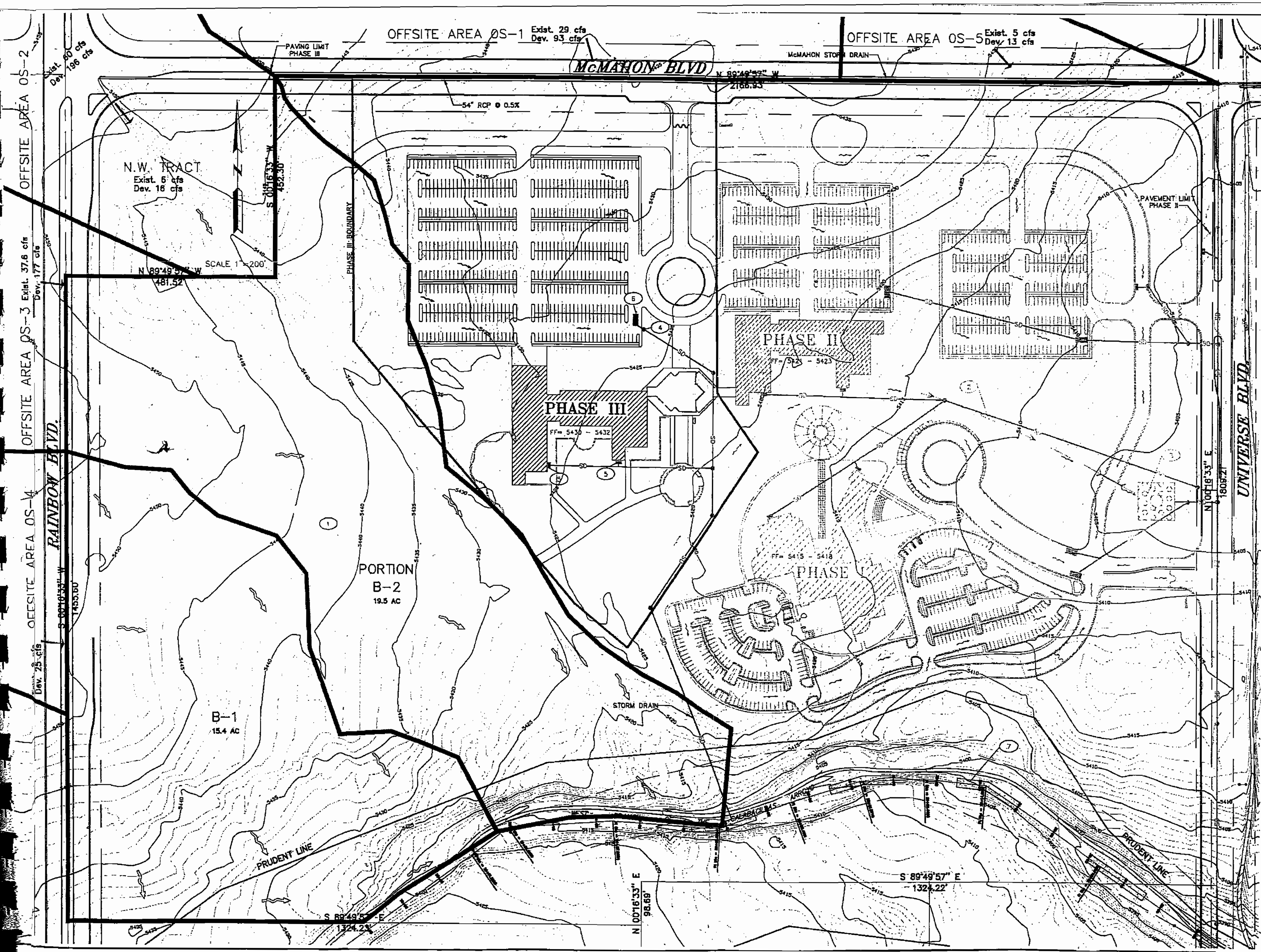
P.R.	K.S.	J.A.A.
DATE: OCT. 2001	SHEET: PLATE 2	



KEYED NOTES

1. DO NOT DISTURB AREA
2. INTERIM DIVERSION SWALE
3. INTERIM DESILTING BASIN
4. AMAFCA APPROVED WATER QUALITY ENHANCEMENT FACILITY
5. ROOF DRAINS
6. STORM DRAIN INLETS
7. ARROYO DROP STRUCTURES (TYPICAL)

LEGEND

- HISTORIC FLOW
- DESIGN FLOW
- WATER BLOCK
- SD — STORM DRAIN
- BASIN BOUNDARY
- PHASE BOUNDARY
- B-4 ON SITE BASIN ID

DWL ARCHITECTS

DWL ARCHITECTS & PLANNERS, INC. OF NEW MEXICO

202 CENTRAL AVE. SE
WEST COURTYARD
ALBUQUERQUE, NEW MEXICO
87102

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E-MAIL DWLNM@RT66.COM

LARKIN GROUP
8500 MENAUL NE SUITE A-440
ALBUQUERQUE, NEW MEXICO 87112
TELEPHONE (505) 275-7500
FAX (505) 275-0748

ALBUQUERQUE TVI
NORTHWEST SITE

MASTER DRAINAGE PLAN
PHASE III

DRAWN BY:	DESIGNED BY:	CHECKED BY:
P.R.	K.B.	J.A.A.
DATE: OCT. 2001	SHEET: PLATE 3	

OFFSITE AREA OS-1 Exist. 29 cfs Dev. 93 cfs

OFFSITE AREA OS-5 Exist. 5 cfs Dev. 13 cfs

McMAHON BLVD

N 89°49'57" W 2166.93

OFFSITE AREA OS-2 Exist. 80 cfs Dev. 196 cfs

OFFSITE AREA OS-3 Exist. 37.6 cfs Dev. 177 cfs

OFFSITE AREA OS-4 Exist. 9 cfs Dev. 25 cfs

RAINBOW BLVD.

N.W. TRACT
Exist. 6 cfs
Dev. 16 cfs

S 00°16'33" W 482.30

N 89°49'57" W 481.52

SCALE 1"=200

PORTION OF B-2
13.4 AC

78" RCP @ 0.7%

PHASE IV BOUNDARY

PHASE III
FF= 5430 - 5432

PHASE II
FF= 5421 - 5423

PHASE I
FF= 5415 - 5418

PHASE IV
FF= 5431 - 5433

PHASE IV BOUNDARY

WEST BRANCH OF THE CALABACILLAS ARROYO

PRUDENT LINE

EXTEND STORM DRAIN TO ARROYO

PAVING LIMITS @ PROPERTY LINE

S 89°49'57" E 1324.29'

N 00°16'33" E 98.69'

S 89°49'57" E 1324.22'

N 00°16'33" E 1809.21'

UNIVERSE BLVD.

KEYED NOTES

1. DO NOT DISTURB AREA
3. INTERIM DESILTING BASIN
4. AMAFCA APPROVED WATER QUALITY ENHANCEMENT FACILITY
5. ROOF DRAINS
6. STORM DRAIN INLETS
7. ARROYO DROP STRUCTURES (TYPICAL)

LEGEND

- HISTORIC FLOW
- DESIGN FLOW
- WATER BLOCK
- SD — STORM DRAIN
- BASIN BOUNDARY
- PHASE BOUNDARY
- B-4 ON SITE BASIN ID

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OF NEW MEXICO

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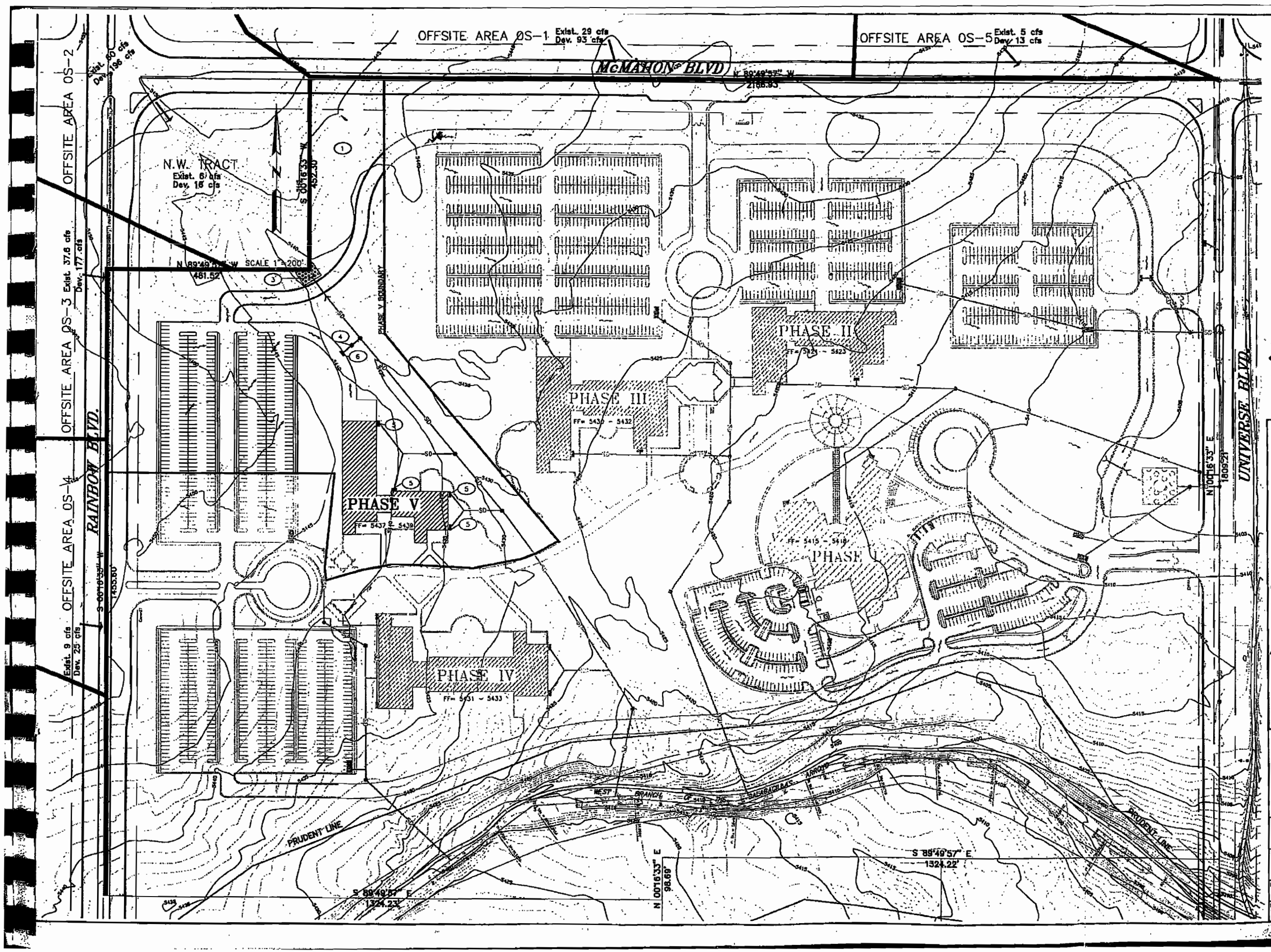
FAX (505) 275-0748

ALBUQUERQUE TVI
NORTHWEST SITE

MASTER DRAINAGE PLAN
PHASE IV

DRAWN BY:	DESIGNED BY:	CHECKED BY:
P.R.	K.B.	J.A.A.
DATE: OCT. 2001	SHEET: PLATE 4	



KEYED NOTES

1. DO NOT DISTURB AREA
3. INTERIM DESILTING BASIN
4. AMAFCA APPROVED WATER QUALITY ENHANCEMENT FACILITY
5. ROOF DRAINS
6. STORM DRAIN INLETS
7. ARROYO DROP STRUCTURES (TYPICAL)

LEGEND

- HISTORIC FLOW
- DESIGN FLOW
- WATER BLOCK
- SD — STORM DRAIN
- BASIN BOUNDARY
- PHASE BOUNDARY
- B-4 ON SITE BASIN ID

DWL ARCHITECTS

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OF NEW MEXICO

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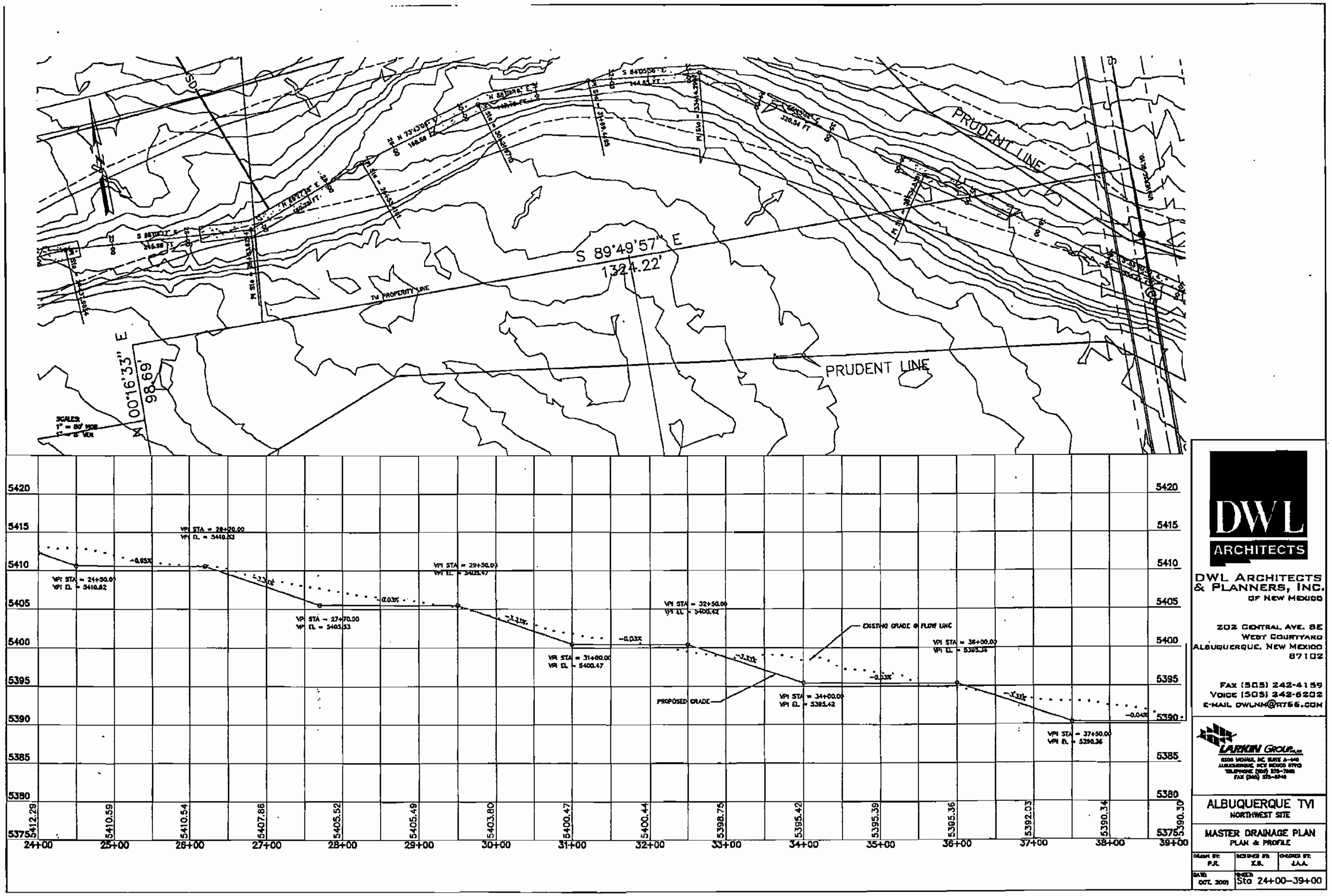
TELEPHONE (505) 275-7900
FAX (505) 275-8748

ALBUQUERQUE TVI
NORTHWEST SITE

MASTER DRAINAGE PLAN
PHASE V

DRAWN BY:	DESIGNED BY:	CHECKED BY:
P.R.	K.B.	J.A.A.
DATE: OCT. 2001	SHEET:	PLATE 5



PRUDENT LINE
PRUDENT LINE
S 89°49'57" E
1324.22'
N 00°16'33" E
98.69'
TVI PROPERTY LINE
SD
5420
5415
5410
5405
5400
5395
5390
5385
5380
5375
5412.29
5410.59
5410.54
5407.86
5405.52
5405.49
5403.80
5400.47
5400.44
5398.75
5395.42
5395.39
5395.36
5392.03
5390.34
5390.30
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00
39+00
EXISTING GRADE @ FLOW LINE
PROPOSED GRADE
DWL
ARCHITECTS
DWL ARCHITECTS & PLANNERS, INC. OF NEW MEXICO
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WEST COURTYARD
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LARKIN GROUP
ALBUQUERQUE TVI
NORTHWEST SITE
MASTER DRAINAGE PLAN
PLAN & PROFILE
OCT. 2001
Sta 24+00–39+00

ZAP A10

GRANT OF EASEMENT
FLOODWAY AND STORM DRAINAGE WORKS

ALBUQUERQUE TECHNICAL VOCATIONAL INSTITUTE (name(s)) _____ (marital status), Grantor(s), being the owner(s) of the property described herein, for good and valuable consideration, the receipt of which is hereby acknowledged, hereby grants, bargains, sells and conveys to the ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY, a political subdivision of the State of New Mexico, (AMAFCA), its successors and assigns, the permanent right and easement for drainage, flood control and the conveyance and storage of storm water, and for the construction, reconstruction, operation and maintenance of, and access to, such appurtenant facilities as may be necessary on, in, under, over and across the following described real estate:

The land in which the foregoing rights and easement are granted is located within Lot(s) _____, Block_____, Tract _____, Unit_____ of LANDS OF ALBUQUERQUE T-VI _____ subdivision in Bernalillo County, New Mexico, being more particularly described in Exhibit "A" attached hereto and incorporated herein by reference.

Except with the written approval of AMAFCA, no fence, wall, building, or other obstruction may be placed or maintained in said easement, and there shall be no alteration of the grades or contours in said easement. The granting of this easement shall not obligate AMAFCA to maintain any arroyo, drainage channel or other facility, nor shall this easement require AMAFCA to provide for the protection of property lying outside of the easement granted. AMAFCA shall only maintain property and/or improvements that it specifically agrees, by written agreement filed for public record, to maintain. Unless AMAFCA specifically so agrees to maintain property and/or improvements, all maintenance responsibility shall remain with the Grantor. Landscaping or maintenance work by the Grantor, within the easement hereby conveyed, shall not alter the present flowline, capacity, or permeability of the present flood way area, except in an emergency. If emergency work is performed, Grantor shall notify AMAFCA as soon as practical thereafter. AMAFCA will then determine if the emergency work can remain or must be removed or modified. Safe locations for structures built on lands adjacent to the easement described herein may be substantially outside of the described area.

Grantors covenant and warrant that they are the owners in fee simple of the property and that they have a good and lawful right to grant the easement described herein. The grant and other provisions of this easement constitute covenants running with the land for the benefit of AMAFCA and its successors and assigns until terminated.

TO HAVE AND TO HOLD the said right and easement for the uses and purposes aforesaid, unto AMAFCA, its successors and assigns, to run with the land forever. However, to the extent any portion of the above granted easement area is declared unnecessary for flood

control or drainage by the Board of Directors of the Albuquerque Metropolitan Arroyo Flood Control Authority, said portion of the easement shall revert to the Grantor. Any such reversion shall be accomplished by way of a quitclaim deed to Grantor, its successors or assigns.

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

WITNESS _____ hand__ and seal__ this 22 day of May, 2002.

GRANTORS:

Michael J Glennon

Michael J. Glennon

ACKNOWLEDGMENT FOR NATURAL PERSONS

STATE OF NEW MEXICO)
)s.s.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 200___ by _____
_____.

My commission expires:

_____

_____
Notary Public

ACKNOWLEDGMENT FOR CORPORATIONS/PARTNERSHIPS

STATE OF NEW MEXICO)
)s.s.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on May 22, 2002 by Michael J. Glennon
_____, the President of Albuquerque TVI
_____.

My commission expires:
8/4/04

Elizabeth Lucero
Notary Public

Revised
April 2, 2001

AMAFCA
2002 [illegible]

Mary Herrera Bern. Co. EASE R 11.00

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Page: 2 of 3
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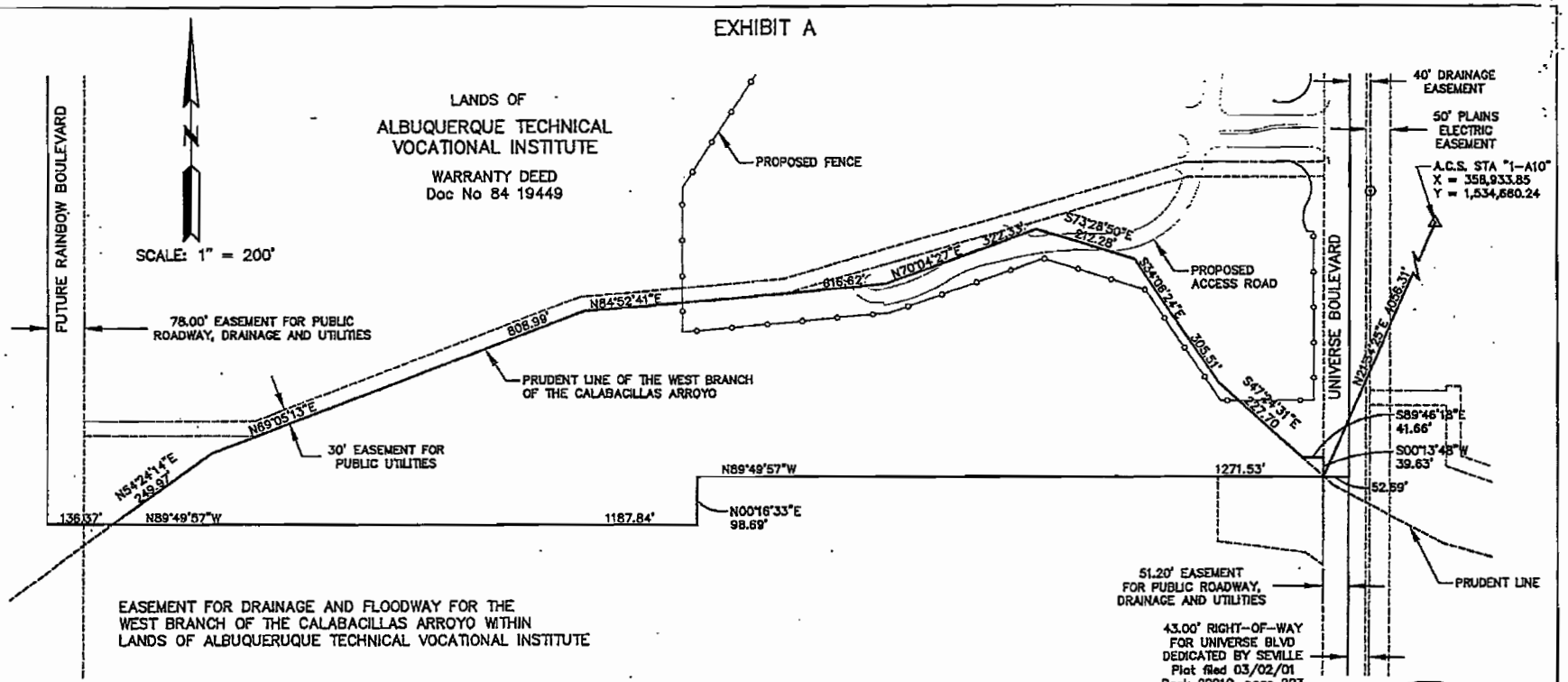
EXHIBIT A



SURVEY DESCRIPTION

A certain parcel of land being described as an easement for public utilities situate within projected Section 4, Township 11 North, Range 2 East, New Mexico Principal Meridian, in the Town of Alameda Grant, City of Albuquerque, Bernalillo County, New Mexico, comprising a portion of that parcel described in Warranty Deed filed in the office of the County Clerk of Bernalillo County, New Mexico on March 14, 1984, Document No. 8419449; and being more particularly described by New Mexico State Plane grid bearings and ground distances as follows:

Beginning at a point on the South Line of the above described tract of land, from whence the Southeast corner of the above tract bears S89°49'57"E, a distance of 52.69 feet, and the Albuquerque Control Survey Monument Station "1-A10" bears N21°34'25"E, a distance of 4056.31 feet; thence, from said point of beginning, N89°49'57"W, a distance of 1271.53 feet to a point; thence, S00°16'33"W, a distance of 98.69 feet to a point; thence, N89°49'57"W, a distance of 1187.84 feet to a point; thence, N54°24'14"E, a distance of 249.97 feet to a point; thence, N69°05'13"E, a distance of 808.99 feet to a point; thence, N84°52'41"E, a distance of 616.62 feet to a point; thence, N70°04'27"E, a distance of 322.33 feet to a point; thence, S73°28'50"E, a distance of 212.28 feet to a point; thence, S34°06'24"E, a distance of 305.51 feet to a point; thence, S47°24'31"E, a distance of 227.70 feet to a point; thence, S89°46'18"E, a distance of 41.66 feet to a point; thence, S00°13'48"W, a distance of 39.63 feet to the Southeast corner and point of beginning of the parcel herein described;

SURVEYOR'S CERTIFICATE

I, Gayle D. Jewell, licensed New Mexico Surveyor No. 4071, do hereby certify that this plat and description were prepared by me or under my supervision and directions, and that the same are true and correct to the best of my knowledge and belief.

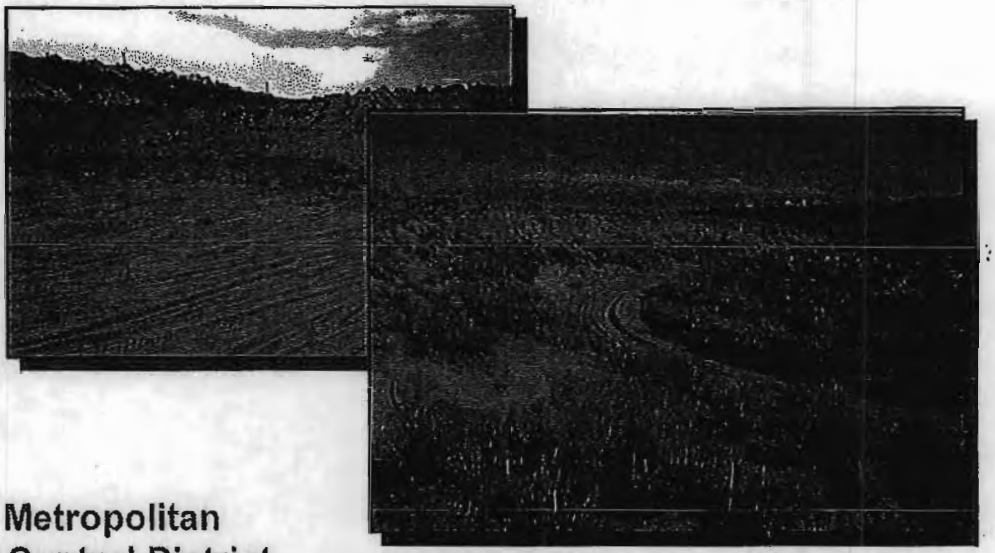
GAYLE D. JEWELL NMPLS 4071 — DATE 05-14-02

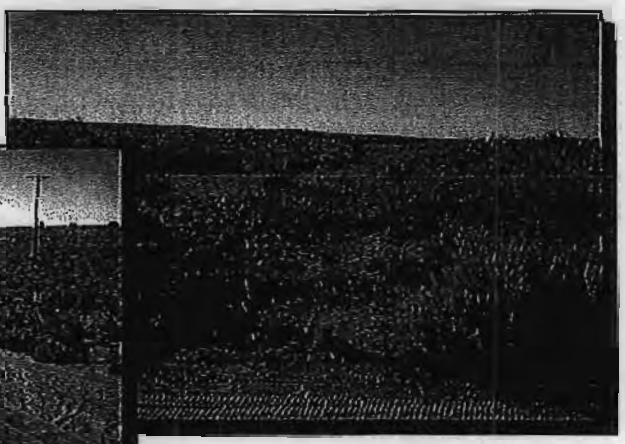
REGISTERED PROFESSIONAL LAND SURVEYOR — STATE OF NEW MEXICO — NO. 4071 — GAYLE JEWELL

LARKIN GROUP, P.A.
8500 MENAUL, NE, SUITE A-440
ALBUQUERQUE, NEW MEXICO 87112
TELEPHONE (505) 275-7500
FAX (505) 275-0748

DRAFT

Calabacillas Arroyo Prudent Line Study and Related Work
Development of a Prudent Line for the West Branch
Albuquerque, New Mexico





Prepared for:

Albuquerque Metropolitan
Arroyo Flood Control District
2600 Prospect Avenue, NE
Albuquerque, NM 87107

Prepared by:

Musselter Engineering, Inc.
1730 South College Avenue, Suite 100
Fort Collins, Colorado 80525

December 1999

conditions 100-year peak flow (bulked). The low velocity areas in the lower approximately 1,000 feet of the study reach are due to the wide sections at the proposed grade-control structures which are designed for the predicted ultimate configuration of the arroyo. The locally high velocities at approximately Station 300+00 are caused by a constriction in the arroyo, and the low velocities just upstream of the constriction are due to backwater from the constriction (Figure 3.1c). Other than the low velocities at the proposed grade-control structures there is a general increase in velocities in the downstream direction. This increase can be attributed, in part, to the increase in discharge in the downstream direction. Also, the channel is very flat and wide upstream of about Station 300+00, contributing to the low velocities in this area, and is incised and confined downstream of about Station 50+00, contributing to the higher velocities in this area (with the exception of the locally low velocities at the grade-control structures downstream of Station 10+00).

To facilitate the analysis of the vertical and horizontal stability of the channel, the overall study reach was subdivided into 8 computational subreaches based on similarity of geomorphic and hydraulic characteristics and the location of significant tributaries. The reach breakdown is shown on Maps 1 through 6 (Appendix A).

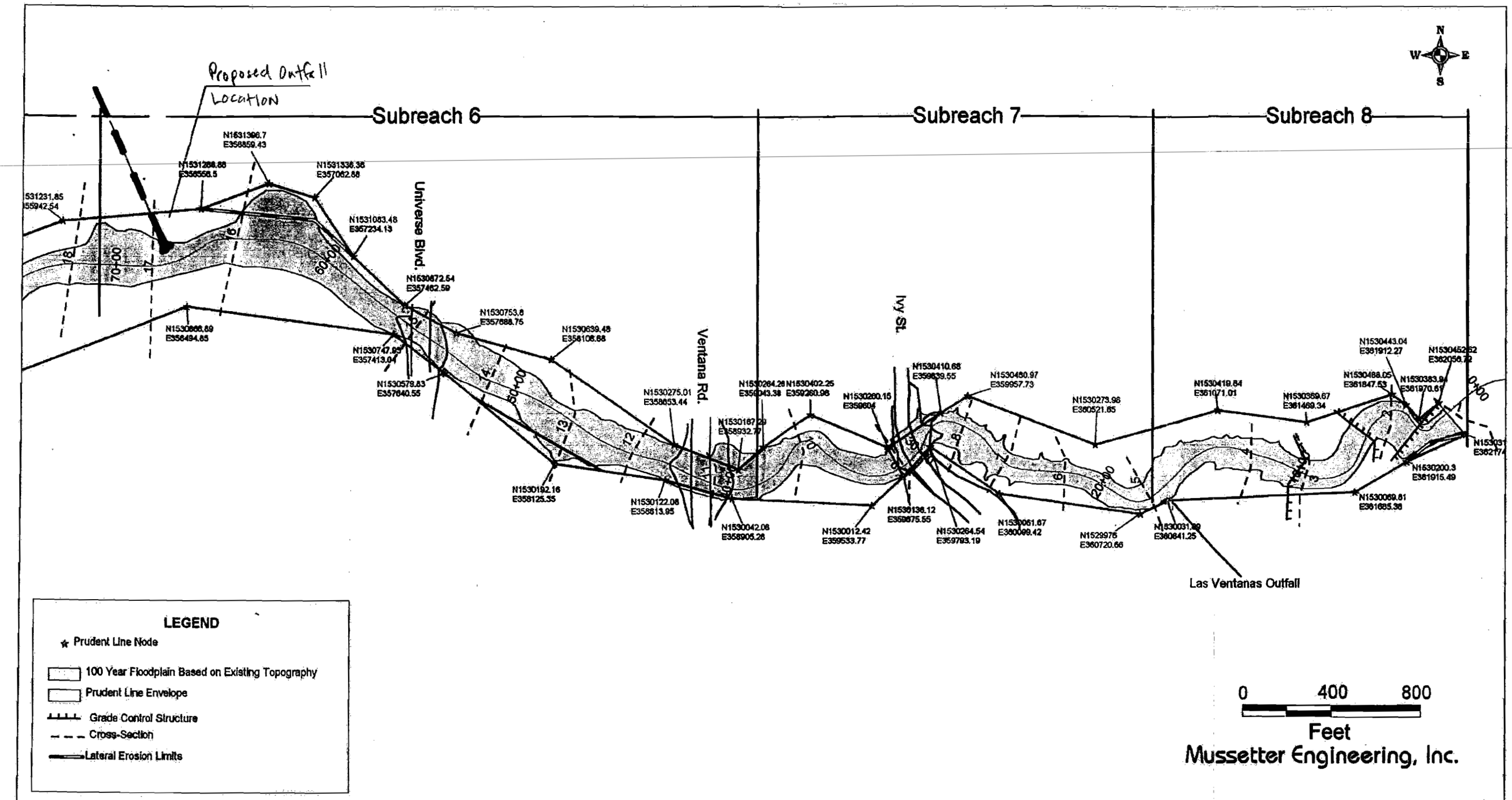
Average values of main channel velocity, hydraulic depth, effective width, and energy slope were computed for each hydraulic reach for a range of discharges up through the 2036 development conditions bulked 100-year flood peak (5,250 cfs at the mouth). Cross sections at the grade-control structures and other local hydraulic controls were not included in the computed averages. The results are summarized in **Table 3.1**.

3.3. Floodplain Mapping

Limits of the 100-year floodplain for 2036 conditions were developed using the results of the hydraulic analysis and the most recent available mapping (the 1986 1"=200' scale 2-foot contour interval base maps for the area above Station 60+00, and the 1999 1-foot contour interval maps provided by Easterling and Associates, Inc. for the area below 60+00). Because the analysis showed the flows to be near critical flow conditions, the floodplain limits were mapped using the computed energy grade profiles. The resulting floodplain boundaries are shown on Maps 1 through 6 (Appendix A).

Floodplain Mapping based upon ENERGY GRADE LINE

	SECTION	Q		H.G.L.			E.G.L.					
1	20	164	5440	5441.21	54	40.94	5441.43	0.0115	3.78	43.67	44.03	0.68
1	20	327	5440	5441.65	54	41.43	5442.05	0.0149	5.1	64.13	49.84	0.79
1	20	867	5440	5442.78			5443.48	0.0146	6.72	128.97	65.04	0.84
1	20	1530	5440	5443.74			5444.67	0.0140	7.73	197.84	76.01	0.86
1	20	2125	5440	5444.45			5445.52	0.0132	8.28	256.79	87.6	0.85
1	20	3126	5440	5445.35			5446.66	0.0130	9.17	341.18	100.57	0.87
1	20	3768	5440	5445.76			5447.27	0.0135	9.88	383.61	108.3	0.9
1	20	4904	5440	5446.44	54	46.22	5448.24	0.0132	10.78	463.35	126.36	0.91
1	19	41	5424.8	5425.48	54	25.37	5425.62	0.0196	3.01	13.63	28.75	0.77
1	19	82	5424.8	5425.85	54	25.66	5425.99	0.0140	3.04	26.94	43.27	0.68
1	19	164	5424.8	5426.15	54	26	5426.39	0.0178	3.9	42.08	55.34	0.79
1	19	327	5424.8	5426.66	54	26.46	5426.96	0.0135	4.41	74.21	67.61	0.74
1	19	867	5424.8	5427.53	54	27.29	5428.17	0.0141	6.42	136.81	75.75	0.82
1	19	1530	5424.8	5428.26	54	28.09	5429.25	0.0153	8.06	194.37	82.6	0.9
1	19	2125	5424.8	5428.77	54	28.69	5430.06	0.0162	9.2	236.05	87.44	0.95
1	19	3126	5424.8	5429.56	54	29.56	5431.22	0.0163	10.49	309.61	94.84	0.98
1	19	3768	5424.8	5430.06	54	30.06	5431.87	0.0166	11	357.87	99.53	0.98
1	19	4904	5424.8	5430.74	54	30.74	5432.9	0.0159	12.04	428.24	108.34	1
1	18	41	5414.5	5415.28			5415.36	0.0107	2.33	17.6	34.5	0.57
1	18	82	5414.5	5415.49			5415.65	0.0151	3.24	25.3	39.12	0.71
1	18	164	5414.5	5415.98			5416.16	0.0118	3.52	46.57	52.8	0.66
1	18	327	5414.5	5416.4			5416.71	0.0150	4.43	73.88	71.22	0.77
1	18	867	5414.5	5417.27			5417.82	0.0146	6.92	146.53	89.37	0.81
1	18	1530	5414.5	5418.04			5418.8	0.0136	7.03	217.6	97	0.83
1	18	2125	5414.5	5418.61			5419.54	0.0130	7.73	274.95	102.74	0.83
1	18	3126	5414.5	5419.48			5420.6	0.0118	8.49	368.29	111.45	0.82
1	18	3768	5414.5	5419.91			5421.18	0.0119	9.03	417.14	116.41	0.84
1	18	4904	5414.5	5420.53			5422.09	0.0123	10	492.52	126.67	0.87
1	17	43	5409.2	5409.91	54	9.84	5410.04	0.0214	2.85	15.08	36.82	0.79
1	17	86	5409.2	5410.21			5410.37	0.0150	3.22	26.67	41.4	0.71
1	17	172	5409.2	5410.49			5410.79	0.0195	4.42	38.88	45.72	0.85
1	17	344	5409.2	5411.1			5411.48	0.0143	4.93	69.74	55.16	0.77
1	17	911	5409.2	5412.25			5412.88	0.0131	6.34	143.68	72.96	0.8
1	17	1609	5409.2	5413.14			5414.02	0.0132	7.5	214.91	89.06	0.83
1	17	2222	5409.2	5413.67			5414.79	0.0136	8.5	268.52	105.97	0.87
1	17	3350	5409.2	5414.45	54	14.43	5415.94	0.0142	9.93	357.75	128.4	0.92
1	17	4070	5409.2	5414.91	54	14.91	5416.55	0.0139	10.6	418.69	136.02	0.92
1	17	5298	5409.2	5415.61	54	15.61	5417.46	0.0134	11.27	518.48	147.65	0.93
1	16	43	5403	5403.89	54	3.69	5403.98	0.0112	2.12	20.33	46.7	0.57
1	16	86	5403	5404.06	54	3.92	5404.2	0.0157	3.01	28.58	49.69	0.7
1	16	172	5403	5404.45	54	4.21	5404.64	0.0122	3.51	49	56.39	0.66
1	16	344	5403	5404.78	54	4.63	5405.17	0.0174	5.04	68.26	60.15	0.83
1	16	911	5403	5405.63	54	5.57	5406.51	0.0193	7.54	122.22	65.92	0.95
1	16	1609	5403	5406.47	54	6.46	5407.75	0.0185	9.16	179.58	71.76	0.98
1	16	2222	5403	5407.1	54	7.1	5408.67	0.0170	10.13	227.43	78.26	0.98
1	16	3350	5403	5408.15	54	8.15	5410.08	0.0148	11.35	315.19	88.93	0.96
1	16	4070	5403	5408.76	54	8.76	5410.86	0.0136	11.93	370.71	95.06	0.94
1	16	5298	5403	5409.64	54	9.64	5412.03	0.0129	12.86	456.69	104.04	0.94
1	15	43	5387.4	5388.38	53	88.38	5388.65	0.0329	4.2	10.24	19.16	1.01
1	15	86	5387.4	5388.85			5389.13	0.0175	4.22	20.4	23.61	0.8
1	15	172	5387.4	5389.21	53	89.21	5389.74	0.0228	5.87	30.12	34.29	0.96
1	15	344	5387.4	5389.92	53	89.92	5390.5	0.0147	6.46	65.91	66.31	0.83
1	15	911	5387.4	5390.97	53	90.97	5391.8	0.0139	8.45	147.67	67.42	0.87
1	15	1609	5387.4	5391.76	53	91.76	5392.87	0.0145	10.12	220.75	86.93	0.93
1	15	2222	5387.4	5392.34	53	92.34	5393.63	0.0145	11.15	278.85	103.73	0.95
1	15	3350	5387.4	5393.19	53	93.19	5394.82	0.0146	12.73	371.78	113.77	0.99
1	15	4070	5387.4	5393.71	53	93.71	5395.47	0.0144	13.4	431.77	119.81	0.99
1	15	5298	5387.4	5394.43	53	94.43	5396.46	0.0145	14.56	521.42	128.3	1.02
1	14	43	5380.5	5381.77	53	81.49	5381.92	0.0100	3.06	14.04	17.14	0.6
1	14	86	5380.5	5382.06	53	81.88	5382.37	0.0162	4.48	19.32	24.47	0.79
1	14	172	5380.5	5382.57	53	82.67	5382.91	0.0130	5	45.45	72.97	0.74
1	14	344	5380.5	5382.9	53	82.9	5383.44	0.0189	6.71	71.78	84.27	0.92
1	14	911	5380.5	5383.82			5384.35	0.0148	7.38	177.2	125.78	0.86
1	14	1609	5380.5	5384.52			5385.16	0.0140	8.07	269.31	137.14	0.86


Proposed Outfall Location
Subreach 6
Subreach 7
Subreach 8
N
W
E
S
N1531396.7
E356859.43
N1531288.68
E356558.5
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E357062.68
N1531083.48
E357234.13
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E359839.55
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E361469.34
N1530443.04
E361912.27
N1530452.62
E362056.72
N1530468.05
E361847.53
N1530383.94
E361970.61
N1530200.3
E361915.49
N1530069.81
E361685.36
Universe Blvd.
Ventana Rd.
Ivy St.
Las Ventanas Outfall
LEGEND
Prudent Line Node
100 Year Floodplain Based on Existing Topography
Prudent Line Envelope
Grade Control Structure
Cross-Section
Lateral Erosion Limits
0
400
800
Feet
Mussetter Engineering, Inc.

Appendix A1

CITY OF ALBUQUERQUE

December 29, 2010

Vancel Fossinger, PE
c/o Brigitte Fuller
Wilson & Company
2600 American Rd, SE, Ste. 100
Rio Rancho, NM 87124

Re: CNM Westside Drainage Master Plan
Engineer Stamp 11-16-10 (A09/D1)

Dear Mr. Fossinger,

Based upon information provided in your submittal dated 12-22-10, the above referenced DMP is acceptable to the City of Albuquerque and the increased runoff into the City storm drain in Universe is approved. Please keep the City informed if there are revised development patterns that cause deviations to the drainage scheme in order to determine what DMP amendments are necessary. Thank you for preparing a concise and comprehensive report.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham

Bradley L. Bingham, PE
Principal Engineer, Planning Dept.
Development and Building Services

C: file

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

WILSON & COMPANY

4900 Lang Avenue NE
ALBUQUERQUE, NEW MEXICO 87109
(505) 348-4000
FAX (505) 348-4072

TRANSMITTAL

Date:	December 22, 2010
Job No.:	CNM Phase III 1060002700

One Stop

Attn: Brad Bingham

WE ARE SENDING YOU

☑ Attached ☐ Under Separate Cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

Copies	Date	Pages/Sheets	Description
1			Drainage Maser Plan

THESE ARE TRANSMITTED AS CHECKED BELOW:

☐ For approval/signature ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☑ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Return _____ copies ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____, ___ ☐ PRINTS ON LOAN – RETURN TO WC*EA* AFTER BID

COPY TO: File.

SIGNED: Brigitte Fuller

RECEIVED BY: 12-29-10

DATE: _____

WILSON &COMPANY

Memorandum

Arizona
California
Colorado
Kansas
Missouri
Nebraska
New Mexico
Oklahoma
Texas
Utah

To: Brad Bingham, PE

From: Brigitte Fuller, PE BMF

CC: File

Date: December 22, 2010 **File Number:** 10 600 027 00

Re: CNM Westside Phase III DMP

Brad,

The Drainage Master Plan for CNM Westside was submitted to Bernalillo County for review. Comments were received on 12/15/10. Please see attached. The condition for approval is the City providing a letter indicating acceptance of the increased discharge to the Universe storm drain system. The Drainage Master Plan is attached for your review. Please do not hesitate to contact me (505 348-4000) or Vancel Fossinger (719 649 2022) if you have questions.

County of Bernalillo
State of New Mexico

Bernalillo County Public Works
2400 Broadway S.E.
Albuquerque, NM 87102
505-848-1500
Fax 505-848-1510

Date: December 15, 2010

Subject: GRADING AND DRAINAGE PLAN APPROVAL

Case No.: PWDN 20100082

Zone Map No: A-9

Street Address: 10549 UNIVERSE

Name of Applicant: CNM

Dear Applicant:

This letter is to notify you that Bernalillo County Public Works Department has reviewed and approved the above referenced plan. There may be conditions associated with this approval so please review the attached case comments and approval form.

PLEASE NOTE: As of January 1, 2010 Bernalillo County Public Works will be requesting electronic copies (pdf) of final reports, maps, plans and as-builts. Electronic copies can be submitted on CD or by e-mail. Please call 848-1520 for instructions on where to email final documents.

Thank You
Bernalillo County Public Works Department

Mr. Fassinger,
This is an excellent report. Good Job
Don Bruggo

BERNALILLO COUNTY
PUBLIC WORKS

Date: 14-Dec-2010

Your:	x	submittal of drainage information
		resubmittal of drainage information
is:		approved.
	x	approved with comments/conditions.
		disapproved.
		deferred to County Floodplain Administrator.

TO BE FILLED OUT BY BERNALILLO COUNTY PUBLIC WORKS DIVISION ONLY

Case review comments are:

x	attached.
	not attached.

Resubmittal is:

x	not required.
	required. When resubmitting, please use Resubmittal Form.

Please submit:

	grading/drainage plan with revisions.
	as-constructed grading/drainage plan.
	other:

It is required that:

	Bernalillo County Public Works Division inspects improvements prior to final sign-off of plat.
	Bernalillo County Public Works Division signature line be placed on plat.

Remarks: CNM Westside Drainage Master Plan

Donald R. Briggs, P.E.
Development Review Engineer
Bernalillo County Public Works Division

Lynn Mazur, P.E.
Development Review Engineer
AMAFCA

Cc:	x	Owner:	CNM
	x	Agent:	Wilson & Company (Vancel Fossinger P.E.)
	x	Case File	PWDN 20100082
		Other:	

County of Bernalillo
Case Comments Report

Permit: PWDN 20100082

Department: PDEV

Activity: (PWDRAN) PW GRADING & DRAINAGE PLAN REVIEW

Action: (PWDRAN) REVIEW GRADING & DRAINAGE COMMENTS

1. Note Date: 22-NOV-2010

   Description: PUBLIC WORKS COMMENTS

   Comments: Based on the information provided in the Draina Master Plan, with engineer's seal dated 11-16-2010, this plan appears to meet the requirements established for this area and is therefore acceptable.

   Development of this property must conform to this plan. Any proposed changes will require a revision to the plan prior to initiating the proposed change.

   Inspection required, applicant required to obtain permits from Bernalillo County Public Works Division. Phone (505)848-1520.

   The approval of this grading and drainage plan does not warrant an approval of the type, compaction or the condition of the fill shown on this plan. This approval does not warrant an approval of the soil compaction or the ability of the soil to sustain building loads planned for the property. A geotechnical engineer should be consulted for questions regarding soils types, testing requirements and other specific conditions for the planned development of this property. Additional permits may be required for fill operations as provided by the Bernalillo County Code Chapter 30 Sec.81.

   Development involving land disturbances equal to or greater than one acre requires a Storm Water Pollution Prevention Plan (SWPPP) in accordance with EPA NPDES Phase II regulations. A SWPPP and certification that a notice of intent has been submitted to the EPA are required prior to any development. Disturbance of areas larger than 3/4 acre require an Air Quality, Fugitive Dust Permit.

   Non-stormwater discharge may be additionally regulated under the water conservation requirements of Chapter 30 of the Bernalillo County Code, or under other county ordinances. Additional information may be obtained from the Bernalillo County Water Resources Program at (505) 848-1544.

   CONDITIONS OF APPROVAL

   1) Please provide a letter from the City of Albuquerque indicating acceptance of the increased discharge to the Universe storm drain system.