Cherne, Curtis

From: Randy Trask [randy.trask@encuentro-solutions.com]

Sent: Tuesday, March 05, 2013 3:25 PM

To: 'Sala, Dolores Madrid'; susan.lacy@nnsa.doe.gov; Jane.Cooper@nnsa.doe.gov

Cc: 'Stogsdill, Cindy'; Dan Mentel; Busch, Suzanne M.; Cherne, Curtis; 'Lissa Kelchner'; Keller,

Elizabeth Kistin

Subject: Next steps: Easement - to tie into City of Abq storm sewer - URGENT

Importance: High

Attachments: M21D007E HYD LTR 6_22_2012.pdf; Folium Solar Final GD Sheets 6-18-2012.pdf

Dear Dolores, Susan and Jane,

Attached you will find the City of Albuquerque's approval letter for the Grading and Drainage Plan (also attached) acknowledging their understanding/approval that we will be connecting to their storm sewer easement on DOE land. The section relevant to DOE land is on page 3. As you can see by the below correspondence from City Hydrology, they will require your approval before authorizing construction of the drainage pipe tie-in. Please advise as how to proceed:

Randy Trask

president encuentro t: 505.231.0677

www.encuentro-solutions.com

From: Curtis Cherne [mailto:CCherne@cabq.gov]

Sent: Tuesday, March 05, 2013 10:55 AM **To:** Suzanne M. Busch; Randy Trask

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

All,

I have attached Hydrology's approval letter of the grading and drainage plan. Sheet 3 of 4 shows the connection to the storm drain on KAFB.

We will need KAFB approval to approve the construction plans (Work Order) that connect to the storm drain on KAFB.

Curtis

From: Busch, Suzanne M.

Sent: Monday, March 04, 2013 3:41 PM

To: 'Randy Trask'

Cc: Cherne, Curtis; Spring, Susan C. **Subject:** RE: Permit Process Snag

Hi Randy, I've tried your number, but can't get through. In any case, I've contacted our Storm Drainage Engineer (Curtis Cherne), and he has offered to make the contact with the DOE if you will provide us with the contact name and number. Please let us know and Curtis will help! Suzanne

From: Randy Trask [mailto:randy.trask@encuentro-solutions.com]

Sent: Monday, March 04, 2013 1:07 PM **To:** Busch, Suzanne M.; Spring, Susan C.

Subject: Permit Process Snag

Importance: High

Dear Suzanne and Susan,

Just received the status of our construction permit for the Emcore Solar array at the SS&TP. On step 3 you request a letter from Kirtland or Sandia Labs stating that we have been cleared to install the drainage pipe under the fence of the base. Unfortunately this is a bit of a chicken or egg scenario for us as we have been provided the following instructions by Sandia and the D.O.E. (who actually owns that land):

Step 1: Get approval from the City of Albuquerque (Storm Water Permit) to tie into the City's existing Storm Water Sewer Easement and provide to DOE Real Estate Office

Step 2: DOE Real Estate Office will draft the easement to allow the drainage pipe to reach the City's Storm Water Sewer Easement

Step 3: Provide DOE Easement and City Storm Water Permit to Kirtland Air Force Base to negotiate a construction plan that will meet the Base's Security requirements.

As you can see, they won't be able to provide us with what you are looking for until we get the nod from you....

Please advise:

Thank you!!!

Randy Trask

president encuentro t: 505.231.0677

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Curtis Cherne

From: Randy Trask [randy.trask@encuentro-solutions.com]

Sent: Tuesday, March 05, 2013 1:47 PM

To: Curtis Cherne; Suzanne M. Busch

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

Hi Curtis,

This <u>IS</u> the progress we've made over the last 12 months including sit-down meetings with the Sandia Science and Tech Park, Sandia Labs, the Department of Energy and Kirtland Air Force Base Administration. It took us almost 6 months to finally get a determination that it was indeed the DOE who would be responsible for the easement and to have someone designated to work on the application. On top of all that the DOE person working on this suddenly retired in December and left no information/status for follow-up. We've spent the last two months reeducating the site office about the project. Additionally, DOE claims their review time is usually 1 year, so the fact that we are now being quoted at 2-3 months is actually a breakthrough! I am routing your letter and the updated plans to them today but at the end of the day we are at the mercy of a Federal Agency regarding land within a National Defense Laboratory. I understand your thoughts completely so I think that it is important that you know this has been a work in progress for a long time! ©

Randy Trask

t: 505.231.0677

From: Curtis Cherne [mailto:CCherne@cabq.gov]

Sent: Tuesday, March 05, 2013 1:25 PM **To:** Randy Trask; Suzanne M. Busch

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

The only hiccup I am seeing is that the facility gets built and we don't have a hook-up to the storm drain. Why hasn't progress been made with the KAFB folks in the past 8 months?

Curtis

From: Randy Trask [mailto:randy.trask@encuentro-solutions.com]

Sent: Tuesday, March 05, 2013 11:39 AM **To:** Suzanne M. Busch; Curtis Cherne

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

THANK YOU!!!!!!!!

Randy Trask

t: 505.231.0677

From: Suzanne M. Busch [mailto:SBusch@cabq.gov]

Sent: Tuesday, March 05, 2013 11:18 AM

To: Randy Trask; Curtis Cherne

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

Hi Randy, there is no reason to hold up the building permit on this item. However, prior to the certificate of occupancy being issued, the storm drain must be completed. Suzanne

From: Randy Trask [mailto:randy.trask@encuentro-solutions.com]

Sent: Tuesday, March 05, 2013 11:11 AM **To:** Curtis Cherne; Suzanne M. Busch

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

Importance: High

We will provide your letter and the grading and drainage plan to the DOE immediately to see if that is sufficient for them to proceed with the easement request, however the approval for the non KAFB plans can now go through, right? The DOE has quoted us 2-3 months for final language and a work order. If this keeps the rest of the plans from going through, we will not meet our interconnection deadline with PNM and the project will die. Can you please clarify this detail? THANK YOU!

Randy Trask

t: 505.231.0677

From: Curtis Cherne [mailto:CCherne@cabq.gov]

Sent: Tuesday, March 05, 2013 10:55 AM **To:** Suzanne M. Busch; Randy Trask

Cc: Susan C. Spring

Subject: RE: Permit Process Snag

All,

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We will need KAFB approval to approve the construction plans (Work Order) that connect to the storm drain on KAFB.

Curtis

From: Busch, Suzanne M.

Sent: Monday, March 04, 2013 3:41 PM

To: 'Randy Trask'

Cc: Cherne, Curtis; Spring, Susan C. **Subject:** RE: Permit Process Snag

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Please advise:

Thank you!!!

Randy Trask

president encuentro

t: 505.231.0677

www.encuentro-solutions.com

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Checked by AVG - www.avg.com

Version: 2013.0.2899 / Virus Database: 2641/6149 - Release Date: 03/04/13

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Please advise:

Thank you!!!

Randy Trask

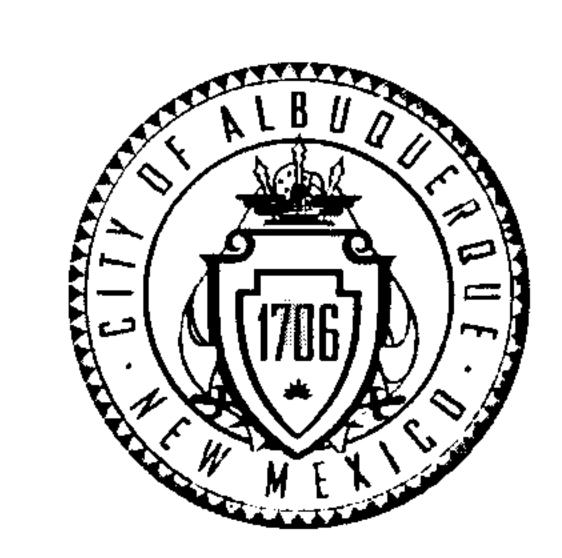
president encuentro t: 505.231.0677

www.encuentro-solutions.com

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CITY OF ALBUQUERQUE

June 22, 2012



Lawrence D. Read, P.E. Larry Read & Associates, Inc 2430 Midtown Suite C Albuquerque, NM 87107

Re: Folium Energy Solar Project, Annexation Portion Section 33

Grading and Drainage Plan

Engineer's Stamp Date 06-18-12 (M-21/D007E)

Dear Mr. Read,

Based upon the information provided in your submittal received 06-20-12, the above referenced is approved for Building Permit. A copy of this approval letter must be on hand when applying for the excavation/barricading permit. The work within the right-of-way has to be submitted and approved through DRC and constructed under the work order.

PO Box 1293

Albuquerque

This project requires a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge for disturbing one acre or more and a Topsoil Disturbance Permit for disturbing ¾ of an acre or more. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

NM 87103

Albuquerque's MS4 Permit became effective March 1st, 2012. Grading and Drainage Plans and Drainage Reports will have to comply with the requirements of the new permit (http://www.cabq.gov/planning/landcoord/Hydrology.html).

Sincerely,

www.cabq.gov

If you have any questions, you can contact me at 924-3695.

Shahab Biazar, P.E.

Senior Engineer, Planning Dept.

Development and Building Services

C: e-mail

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

	CT TITLE: <u>Folium Energy - Solar</u>	<u>r Project</u> EPC#:		ZONE MAP/DRG. FILE #:M-21/D007E WORK ORDER#:
	DESCRIPTION: <u>Annexation portion or</u> DDRESS: <u>2000 Eubank Blvd SE</u>	of Section 33, NW 1/4 SW 1/4	T10N R	4E NMPM
ENGINE	ERING FIRM: <u>Larry Read & Associa</u> ADDRESS: <u>2430 Midtown Place NE</u> CITY, STATE: <u>Albuquerque, New M</u>	E_Suite C		CONTACT: <u>Larry Read</u> PHONE: <u>237-8421</u> ZIP CODE: <u>87107</u>
<u>OWNE</u>	R: <u>Folium Energy</u> ADDRESS: CITY, STATE:			CONTACT: PHONE: ZIP CODE:
<u>ARCHI</u>	CITY, STATE:			CONTACT: PHONE: ZIP CODE:
<u>SURVE</u>	YOR: ADDRESS: CITY, STATE:			CONTACT: PHONE: ZIP CODE:
CONTR	ACTOR: ADDRESS: CITY, STATE:			CONTACT: PHONE: ZIP CODE:
<u>CHECK</u>	TYPE OF SUBMITTAL:		<u>CHEC</u>	K TYPE OF APPROVAL SOUGHT:
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WAS A	PRE-DESIGN CONFERENCE ATTE YES NO COPY PROVIDED	ENDED:		DECEIWED JUN 2 G 2012

DATE SUBMITTED: June 19, 2012

BY:Larry D. Read, PE

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

- 1. Conceptual Grading and Drainage Plan: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5)

acres.

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

	ECT TITLE: <u>Folium Energy - Solar Project</u> EPC#:			ZONE MAP/DRG. FILE #:M-21/D007E WORK ORDER#:
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OWNER	R:Folium Energy ADDRESS: CITY, STATE:			CONTACT: PHONE: ZIP CODE:
<u>ARCHI</u>	CITY, STATE:			CONTACT: PHONE: ZIP CODE:
SURVE	YOR: ADDRESS: CITY, STATE:			CONTACT: PHONE: ZIP CODE:
CONTR	ACTOR: ADDRESS: CITY, STATE:			CONTACT: PHONE: ZIP CODE:
CHECK	TYPE OF SUBMITTAL:	<u>C</u>	CHECK	TYPE OF APPROVAL SOUGHT:
	DRAINAGE REPORT DRAINAGE PLAN 1st SUBMITTAL, REQUIRES TCL or DRAINAGE PLAN RESUBMITTAL CONCEPTUAL GRADING & DRAINAGE PLAN GRADING PLAN EROSION CONTROL PLAN ENGINEER'S CERTIFICATION (HYDROLOGY) CLOMR/LOMR TRAFFIC CIRCULATION LAYOUT (TCL) ENGINEERS CERTIFICATION (TCL) ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN OTHER			SIA / FINANCIAL GUARANTEE RELEASE PRELIMINARY PLAT APPROVAL S. DEV. PLAN FOR SUB'D. APPROVAL S. DEV. PLAN FOR BLDG. PERMIT APPROVAL SECTOR PLAN APPROVAL FINAL PLAT APPROVAL FOUNDATION PERMIT APPROVAL BUILDING PERMIT APPROVAL CERTIFICATE OF OCCUPANCY (PERM.) CERTIFICATE OF OCCUPANCY (TEMP.) GRADING PERMIT APPROVAL PAVING PERMIT APPROVAL WORK ORDER APPROVAL OTHER (SPECIFY)
WAS A	PRE-DESIGN CONFERENCE ATTENDED: YES NO COPY PROVIDED			SO-19 PERMIT

DATE SUBMITTED: MAY 23, 2012

BY:Larry D. Read, PE

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

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- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5)

acres.

Cherne, Curtis

From:

Busch, Suzanne M.

Sent:

Tuesday, May 01, 2012 9:46 AM

To:

Cherne, Curtis

Cc:

'Larry Coons'; 'Joe Tracy'

Subject:

Drainage Plan for Folium Energy Solar Installation at the former Eubank Landfill

Attachments: Eubank.pdf

Hi Curtis, I have concerns about the current design of the drainage plan:

The plan concentrates the run off to the southwest edge of the development. The property south of the development is also part of the former landfill. This basically causes the outfall area to have twice the runoff that it would have had without the development. The waste has decomposed causing uneven settlement and ponding areas throughout the landfill. The added runoff can cause additional landfill gas generation in the property. Since the main constituent is methane, EHD is concerned that the requirements of the *Guidance for Compliance with the City of Albuquerque Environmental Health Department Interim guidelines for Development within City Designated Buffer Zones* cannot be met with the current design.

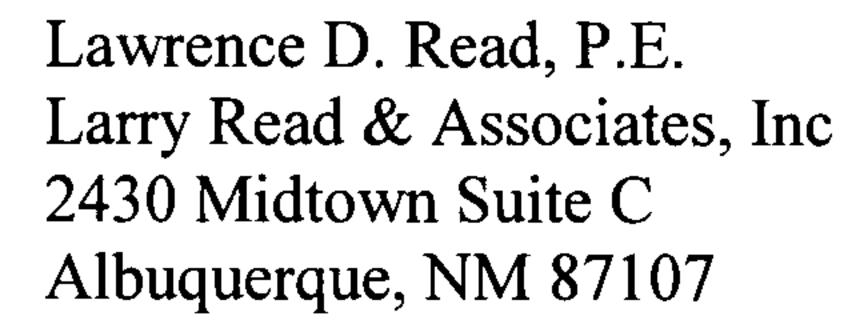
I understand a storm drainage line runs west of the site. I feel it would be advantageous to take advantage of the existing system. I have attached a copy of the area with the former Eubank Landfill outlined for your use.

I appreciate your help with this project.

Suzanne Busch, P.E. Environmental Services Division

CITY OF ALBUQUERQUE

June 5, 2012



Re: Folium Energy Solar Project, Annexation Portion Section 33 Grading and Drainage Plan Engineer's Stamp Date 05-23-12 (M-21/D007E)

Dear Mr. Read,

Based upon the information provided in your submittal received 05-24-12, the above referenced plan cannot be approved for Building Permit and Grading Permit until the following comments are addressed:

- The runoff discharge from the detention pond appears to be controlled by the 30" RCP.
- No weir calculation will be needed.
- Pond AHYMO Routing calculation is started at 58.50, but the top of the discharge point is at 59.00. The runoff is retained from 58.50 to 59.00.
- Environmental Health approval is required. Would the detention pond require a liner? Would a trench detail and ventilation be required?
- Since the storm drain pipe will be extended beyond the property line will there be a need for additional easements and encroachment agreements? Please clearly identify the existing property lines and easements on the plans.
- An encroachment agreement with PNM will be required.
- Provide an emergency overflow.
- The paving section should be 8" instead of 8' subgrade.
- The storm drain manhole within City of Albuquerque easement/right-of-way has to be submitted to DRC for approval.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.

Senior Engineer, Planning Dept.

Development and Building Services

C: e-mail

PO Box 1293

Albuquerque

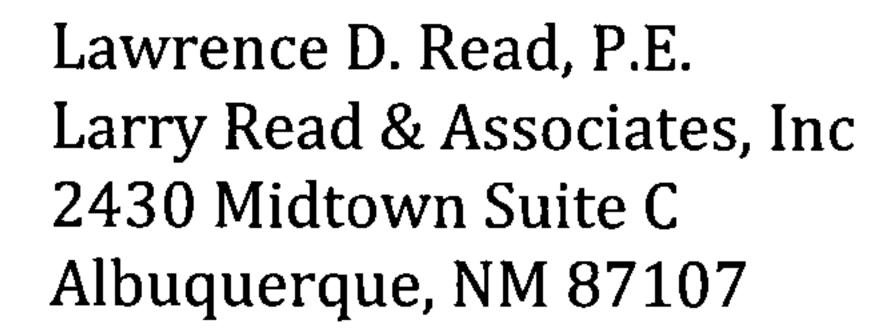
NM 87103

www.cabq.gov

2? Jan Cara Persian

CITY OF ALBUQUERQUE

April 26, 2012





Re: Folium Energy Solar Project, Annexation Portion Section 33
Grading and Drainage Plan
Engineer's Stamp Date 04-18-12 (M-21/D007E)

Dear Mr. Read,

PWY

Based upon the information provided in your submittal received 01-19-12, the above referenced plan cannot be approved for Grading Permit until the following comments are addressed:

- The developed flows in Basin B should not consist of 100% Treatment B since this entire basin will be graded. The asphalt lined channels should be considered Treatment D with the other surface areas Treatment C.
- Off site flows appear to enter Basin B from the north/northeast boundary. Is there a berm located along the northern property line?
- The pond elevation and calculations will need to be updated due to the increased flows once the treatment types are corrected.
- Section "B-B" is listed on the grading plan but does not appear on Sheet 3.
- On Sheet 3 the Asphalt Channel Lining Section denotes a scarification and compaction of the sub-grade to a depth of "8 feet". Is this intended or should it read "8 inches"?
- Will the site contain an access road? If so this should be labeled on the grading plan.
- The North Arrow on the plan is incorrect.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.

Senior Engineer, Planning Dept.

Development and Building Services

C: CJH/SB

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

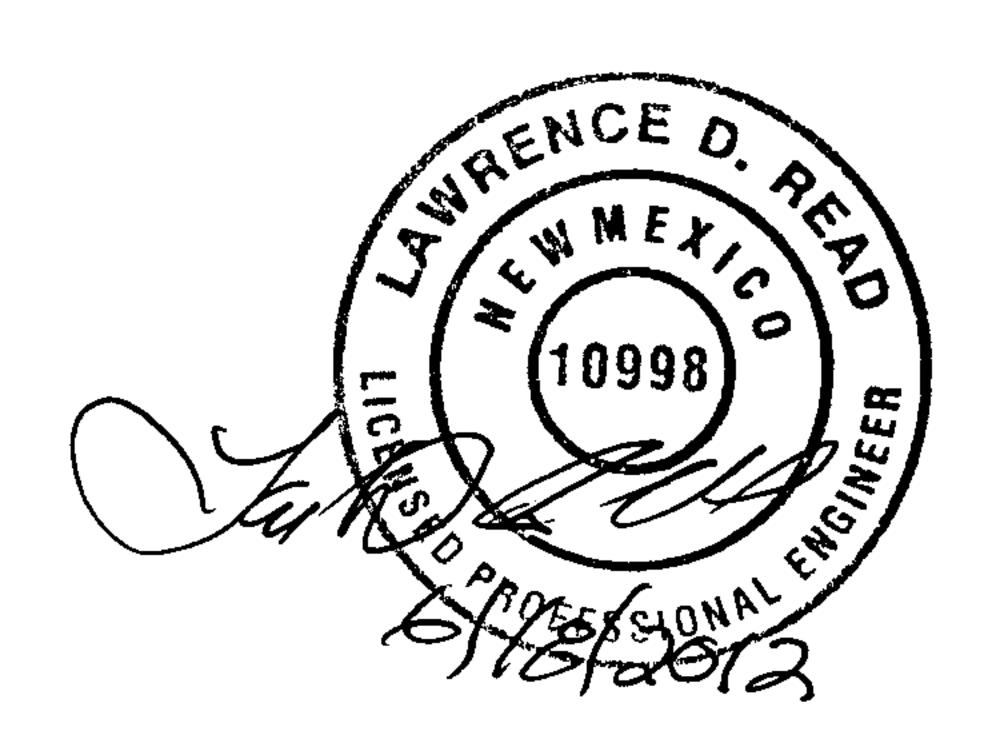
DRAINAGE REPORT

for

FOLIUM SOLAR PROJECT

ALBUQUERQUE, NEW MEXICO

June 2012



Prepared by
Larry D. Read, P.E.
2430 Midtown Place, N.E.
Suite C
Albuquerque, New Mexico 871107
(505) 237-8421 Fax (505) 237-8422

DRAINAGE REPORT

for

FOLIUM SOLAR PROJECT

ALBUQUERQUE, NEW MEXICO

June 2012

LOCATION & DESCRIPTION

The proposed development area is a 13.5 acre portion of the 21.4 acre parcel having a legal description of Annexation portion of Section 33, NW ¼, SW ¼, Township 10 North, Range 4E, Bernalillo County, Albuquerque, New Mexico as shown on the Vicinity Map on plan sheet 1 of 4 in the pocket at the back of this report. The site is located east of the future extension of Eubank Boulevard SE and south of the existing PNM substation that is south of Sandia Research Park. As noted above, only a portion of the parcel is planned for development at this time to avoid the PNM easements existing on-site. Much of the site, including most of the proposed development area, is on top of the old South Eubank Landfill. It is the intention of this project to compact the existing trash and apply a new cap over the trash to allow grading to positively drain storm runoff from the site to help eliminate water infiltrating the trash. Small areas of the trash will be excavated and relocated to other areas of the landfill but only in areas such as the proposed storm drain route where the trash must be excavated to provide a solid bedding for the storm drain.

The planned development is an array of solar power generation panels encompassing the 13.5 acres development area. The panels are supported above grade on columns and do not provide a blockage or diversion of the runoff.

FLOODPLAIN STATUS

This project site, as shown on FEMA's Flood Insurance Rate 35001C0367 G, dated September 26, 2008, is not impacted by any mapped floodplains. A copy of the pertinent portion of this Panel has been shown on plan sheet 1 of 4 in the pocket at the back of this report.

METHODOLOGY

The hydrology for this project was analyzed using the AHYMO computer program from Anderson Hydro in accordance with the June 1997 release of the City of Albuquerque Development Process Manual, Section 22.2. The computer output is included in **Appendix A**.

PRECIPITATION

The 100-yr 6-hour duration storm was used as the design storm for this analysis since both proposed ponds are detention ponds with pipe controlled outfalls. Excess Precipitation and Peak Discharge values for Zone 3 have to be input from tables within of the City of Albuquerque Development Process Manual, Section 22.2.

EXISTING DRAINAGE

The proposed development has been delineated into 4 drainage basins for analysis of the proposed impacts to drainage from this project. The basins are shown on the Drainage Basin Map in this report.

The proposed current development is in Basin B as shown on the Grading Plan in the pocket at the end of this reprot. This basin generally slopes toward the west in a cone shaped pattern with the low area in the west central portion of the basin. As mentioned above, the majority of this basin is over landfill and as such the consolidation of the underlying trash has formed ponds and ruts that do not drain.

The remainder of the parcel, Basin A, is heavily impacted by easements, mostly PNM, and is therefore not proposed for any development or grading at this time. This basin generally slopes toward the southwest with a swale formed in the center of the area that confines the runoff path.

Basin C to the east of the proposed development is much like Basin B in that it is underlain with trash that has consolidated forming pools and ruts that do not drain. The general slope of the land is toward the southwest toward Basin B so the proposed solar site will be impacted by runoff from this basin.

Finally, Basin D to the north of the proposed development appears to be a cellular site. As shown on the Drainage Basin Map and verified in the field, it is graded as a swale running from east to west such that the runoff is contained and routed away from the current proposed development area. The runoff does impact Basin A.

CURRENT PROPOSED DEVELOPED CONDITION

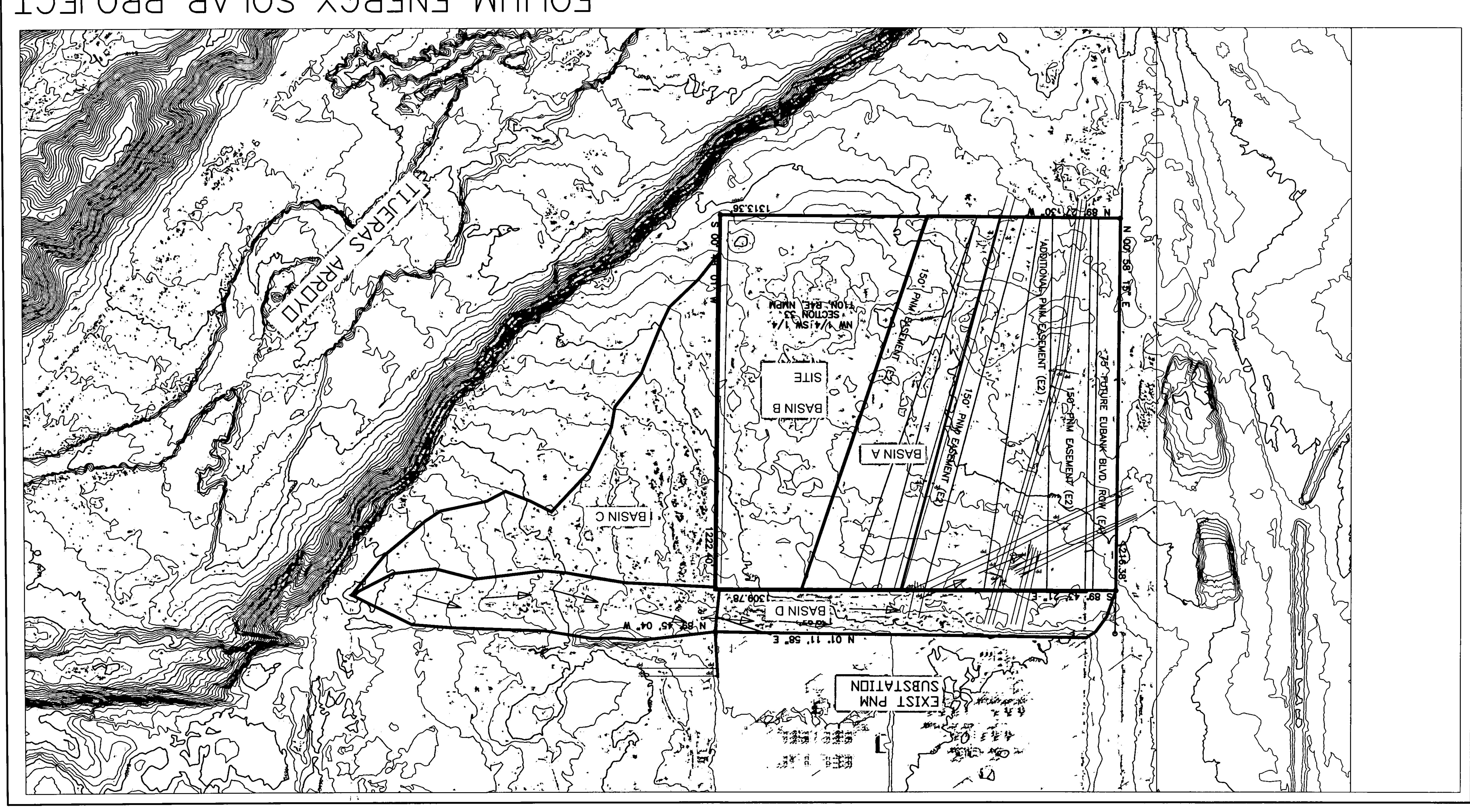
As discussed above the proposed development is all included in Basin B. There are no proposed modifications in any other basin. Basins A and D do not impact the proposed development so are not discussed further in this report.

There are no modifications proposed for Basin C but the runoff from that site does impact the proposed development in Basin B. The development in Basin B has proposed a 3' bottom, asphalt lined, 1' deep swale that runs from north to south along the east property line. The swale (same configuration) turns west at the southeast corner and terminated in a proposed

detention pond at the southwest corner of the proposed development area. This swale alleviates the proposed development area of impacts from offsite by routing offsite runoff around the development are, lessens the possibility moisture penetration into the underling trash causing subsequent consolidation, and lessens the possible erosion on the development area.

The runoff generated within the development area is routed, in shallow sheet flow, toward the southwest per the proposed grading. An asphalt lined swale (same configuration as discussed above) along the west line of the proposed development area intercepts the runoff generated onsite and conveys it south to the detention pond on the southwest corner of the development area. The detention pond is drained, via a proposed 30" storm drain, to the west to the existing 108" south Eubank storm drain. Connection to the existing storm drain is via an existing 42" "Y" on the 108" storm drain.

The proposed detention pond location and configuration was selected because it is in an area that is not underlain by trash so it does not have to be lined.



EVERGY SOLAR PROJECT SOLUM ENERGY SOLAR DOUGE 1, = 300,

APPENDIXA

AHYMO PRINTOUTS & SUPPORT CALCS

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)

- Ver. S4.01a, Rel: 01a

RUN DATE (MON/DAY/YR) =06/19/2012

INPUT FILE = C:\acad projects\Intera\New Site 3-26-2012\Ahymo2.txt

USER NO.= AHYMO_Temp_User:20122010

INFOI FIL	E - C. \acad p	rojects	/IIIC C I	a /New Sti	Le 3-20-201	Z (Allymoz.cxc		U	SER NO A	HIMO_Te	mp_user:20	1122010
		OGRAPH	FROM	TO ID	AREA	PEAK DISCHARGE	RUNOFF VOLUME	RUNOFF	TIME TO PEAK	CFS PER	PAGE =	
COMMAND	IDENTIFI	CATION	NO.	NO.	(SQ MI)	(CFS)	(AC-FT)	(INCHES)	(HOURS)	ACRE	NOTATI	ON
	MPUTE 100 YR. ISTING AHYMO.				R Folium End COA DPM CH						TIME=	0.00
LOCATION RAINFALL *S	TYPE= 1 NOAA	14	ALBU	QUERQUE							RAIN6=	2.600
*S COMPUT *S *S	E RUNOFF FOR	EXISTING	G COND	ITIONS								
*S BASIN COMPUTE N *S *S	A - ON-SITE M HYD	NOT USE		HIS TIME 41	0.03631	78.46	2.326	1.20101	1.533	3.376	PER IMP=	0.00
*S BASIN COMPUTE N *S	B - CURRENT M HYD	PROPOSE:		42	0.02111	40.91	1.215	1.07959	1.533	3.029	PER IMP=	0.00
*S BASIN COMPUTE N *S *S	C - OFFSITE M HYD	EAST OF 143.10		- PREVIOU 43	JSLY DISTURE 0.01661	BED 28.65	0.854	0.96347	1.533	2.694	PER IMP=	0.00
_	D - OFFSITE M HYD	- PNM SI			CELL PHONE : 0.01383	SITEL 29.88	0.886	1.20101	1.533	3.377	PER IMP=	0.00
*s EXIST	ING TOTAL DIS		FROM B	ASINS C	(OFFISTE) a	nd						
ADD HYD *S *S		120.10	42&43	60	0.03772	69.56	2.069	1.02844	1.533	2.882		
*S COMPUT *S *S	E RUNOFF FOR	EXISTING	G COND	ITIONS								
*S BASIN COMPUTE N *S *S	A - ON-SITE M HYD	NOT USE 101.10		HIS TIME 1	0.03631	78.46	2.326	1.20101	1.533	3.376	PER IMP=	0.00
*S BASIN COMPUTE N *S *S	B - CURRENT M HYD	PROPOSE:		2	0.02111	51.43	1.559	1.38537	1.533	3.808	PER IMP=	4.30

*S BASIN C - OFFS COMPUTE NM HYD *S *S	ITE EAST OF 103.10	SITE - PREV - 3	O.01661	28.65	0.854	0.96347	1.533	2.694 PER IMP=	0.00
*S BASIN D - OFFS	SITE - PNM SU	BSTATION AN	D CELL PHONE SI	TEL					
COMPUTE NM HYD	104.10	- 4	0.01383	29.88	0.886	1.20101	1.533	3.377 PER IMP=	0.00
*S									
*s TOTAL RUNOFF R	OUTED TO PON	D FROM ONSI	TE AND OFFSITE						
ADD HYD	120.10	2& 3 20	0.03772	80.08	2.413	1.19953	1.533	3.317	
*S									
*s TOTAL RUNOFF F	OUTED TO PON	D							
*S			0 00000				• • •		
ROUTE RESERVOIR	POND.001	20 30	0.03772	44.31	2.413	1.19953	1.667	1.836 AC-FT=	0.662
* S									
*S									
FINISH									

```
- Version: S4.01a - Rel: 01a
    AHYMO PROGRAM (AHYMO-S4)
       RUN DATE (MON/DAY/YR) = 06/19/2012
       INPUT FILE = C:\acad projects\Intera\New Site 3-26-201\overline{2}\Ahymo2.txt
                 TIME=0
                         PUNCH=0 PRINT LINES=-6
START
     COMPUTE 100 YR. 6 HR. HYDROGRAPHS FOR Folium Energy Solar
     EXISTING AHYMO.txt
                         - HYMO PER COA DPM CHPT 22.2
LOCATION
                 ALBUQUERQUE
    City of Albuquerque soil infiltration values (LAND FACTORS) used for computations.
    Land Treatment
                   Initial Abstr.(in)
                                       Unif. Infilt.(in/hour)
                    0.65
                                       1.67
                     0.50
                                        1.25
                     0.35
                                        0.83
                                        0.04
                    0.10
                 TYPE=-1 RAIN QUAR=0 RAIN ONE=2.14 RAIN SIX=2.60
RAINFALL
                 RAIN DAY=3.10 DT=0.03333333
             6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE AREAS (NM & AZ) - D1
             DT = 0.033333 \text{ HOURS}
                                END TIME = 5.999994 HOURS
*S
*S COMPUTE RUNOFF FOR EXISTING CONDITIONS
*S BASIN A - ON-SITE NOT USED AT THIS TIME
PER A=0 PER B=50 PER C=50 PER D=0 TP=-.133
                 RAIN=-1
    K = 0.121011HR TP = 0.133000HR K/TP RATIO = 0.909858 SHAPE CONSTANT, N = 3.892482
    UNIT PEAK = 94.993 CFS UNIT VOLUME = 1.000 B = 347.94
                                                                       P60 = 2.1400
           0.036311 \text{ SQ MI} IA = 0.42500 \text{ INCHES} INF = 1.04000 \text{ INCHES PER HOUR}
    AREA =
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033333
                          CODE=1
                 ID=41
PRINT HYD
                               PARTIAL HYDROGRAPH 141.10
   RUNOFF VOLUME = 1.20101 INCHES = 2.3258 ACRE-FEET
   PEAK DISCHARGE RATE = 78.46 CFS AT 1.533 HOURS BASIN AREA = 0.0363 SQ. MI.
```

* C

K = 0.133355HR TP = 0.133000HR K/TP RATIO = 1.002670 SHAPE CONSTANT, N = 3.520654 UNIT PEAK = 51.071 CFS UNIT VOLUME = 1.000 B = 321.84 P60 = 2.1400 AREA = 0.021105 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033333

PRINT HYD ID=42 CODE=1

PARTIAL HYDROGRAPH 142.10

RUNOFF VOLUME = 1.07959 INCHES = 1.2152 ACRE-FEET PEAK DISCHARGE RATE = 40.91 CFS AT 1.533 HOURS BASIN AREA = 0.0211 SQ. MI.

*S

*S

*S

*S

*S

BASIN C - OFFSITE EAST OF SITE - PREVIOUSLY DISTURBED

COMPUTE NM HYD

ID=43 HYD NO= 143.1 DA=0.016613 SQ MI

PER A=50 PER B=50 PER C=0 PER D=0 TP=-.133

RAIN=-1

K = 0.145699HR TP = 0.133000HR K/TP RATIO = 1.095482 SHAPE CONSTANT, N = 3.226113 UNIT PEAK = 37.445 CFS UNIT VOLUME = 0.9997 B = 299.77 P60 = 2.1400 AREA = 0.016613 SQ MI IA = 0.57500 INCHES INF = 1.46000 INCHES PER PER

PRINT HYD ID=43 CODE=1

PARTIAL HYDROGRAPH 143.10

RUNOFF VOLUME = 0.96347 INCHES = 0.8537 ACRE-FEET PEAK DISCHARGE RATE = 28.65 CFS AT 1.533 HOURS BASIN AREA = 0.0166 SQ. MI.

PRINT HYD ID=44 CODE=1

PARTIAL HYDROGRAPH 144.10

RUNOFF VOLUME = 1.20101 INCHES = 0.8857 ACRE-FEET PEAK DISCHARGE RATE = 29.88 CFS AT 1.533 HOURS BASIN AREA = 0.0138 SQ. MI.

* S

* (

*s EXISTING TOTAL DISCHARGE FROM BASINS C (OFFISTE) and

*S B (SITE OF THIS PROJECT)

ADD HYD ID=60 HYD NO=120.1 ID I=42 ID II=43

* S

PRINT HYD ID=60 CODE=1

PARTIAL HYDROGRAPH 120.10

RUNOFF VOLUME = 1.02844 INCHES = 2.0688 ACRE-FEET PEAK DISCHARGE RATE = 69.56 CFS AT 1.533 HOURS BASIN AREA = 0.0377 SQ. MI.

*S

*S COMPUTE RUNOFF FOR EXISTING CONDITIONS

* S

* S

*S BASIN A - ON-SITE NOT USED AT THIS TIME

PER A=0 PER B=50 PER C=50 PER D=0 TP=-.133

RAIN=-1

K = 0.121011HR TP = 0.133000HR K/TP RATIO = 0.909858 SHAPE CONSTANT, N = 3.892482 UNIT PEAK = 94.993 CFS UNIT VOLUME = 1.000 B = 347.94 P60 = 2.1400 AREA = 0.036311 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER PER

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = 1.20101 INCHES = 2.3258 ACRE-FEET PEAK DISCHARGE RATE = 78.46 CFS AT 1.533 HOURS BASIN AREA = 0.0363 SQ. MI. *S
*S
*S BASIN B - CURRENT PROPOSED SITE

COMPUTE NM HYD ID=2 HYD NO= 102.1 DA=0.021105 SQ MI

PER A=0 PER B=0 PER C=95.7 PER D=4.3 TP=-.133

RAIN=-1

K = 0.072485HR TP = 0.133000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428 UNIT PEAK = 3.5910 CFS UNIT VOLUME = 0.9962 B = 526.28 P60 = 2.1400 AREA = 0.000908 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER PER

K = 0.108667HR TP = 0.133000HR K/TP RATIO = 0.817047 SHAPE CONSTANT, N = 4.373953 UNIT PEAK = 57.613 CFS UNIT VOLUME = 1.000 B = 379.38 P60 = 2.1400 AREA = 0.020197 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033333

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = 1.38537 INCHES = 1.5594 ACRE-FEET PEAK DISCHARGE RATE = 51.43 CFS AT 1.533 HOURS BASIN AREA = 0.0211 SQ. MI.

*S

*S BASIN C - OFFSITE EAST OF SITE - PREVIOUSLY DISTURBED

COMPUTE NM HYD ID=3 HYD NO= 103.1 DA=0.016613 SQ MI

PER A=50 PER B=50 PER C=0 PER D=0 TP=-.133

RAIN=-1

K = 0.145699HR TP = 0.133000HR K/TP RATIO = 1.095482 SHAPE CONSTANT, N = 3.226113 UNIT PEAK = 37.445 CFS UNIT VOLUME = 0.9997 B = 299.77 P60 = 2.1400 AREA = 0.016613 SQ MI IA = 0.57500 INCHES INF = 1.46000 INCHES PER HOUR RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.0333333

PRINT HYD ID=3 CODE=1

PARTIAL HYDROGRAPH 103.10

RUNOFF VOLUME = 0.96347 INCHES = 0.8537 ACRE-FEET PEAK DISCHARGE RATE = 28.65 CFS AT 1.533 HOURS BASIN AREA = 0.0166 SQ. MI.

*S

*S BASIN D - OFFSITE - PNM SUBSTATION AND CELL PHONE SITEL COMPUTE NM HYD ID=4 HYD NO= 104.1 DA=0.013828 SQ MI

PER A=0 PER B=50 PER C=50 PER D=0 TP=-.133 RAIN=-1

K = 0.121011HR TP = 0.133000HR K/TP RATIO = 0.909858 SHAPE CONSTANT, N = 3.892482 UNIT PEAK = 36.175 CFS UNIT VOLUME = 1.000 B = 347.94 P60 = 2.1400 AREA = 0.013828 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER PER

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.10

RUNOFF VOLUME = 1.20101 INCHES = 0.8857 ACRE-FEET
PEAK DISCHARGE RATE = 29.88 CFS AT 1.533 HOURS BASIN AREA = 0.0138 SQ. MI.

*S *S *						
* S	TOTAL	RUNOFF	ROUTED TO	POND FROM ONSITE	AND OFFSITE	
ADD *S	HYD		ID=20	HYD NO= 120.1 ID	I=2 ID II=3	
			ROUTED TO	POND		
	NT HYD			CODE=1		

PARTIAL HYDROGRAPH 120.10

RUNOFF VOLUME = 1.19953 INCHES = 2.4130 ACRE-FEET

PEAK DISCHARGE RATE = 80.08 CFS AT 1.533 HOURS BASIN AREA = 0.0377 SQ. MI.

*S			
rOUTE RESERVOIR	ID=30 HYD=PON	ND.001 INFLOW ID=2	O CODE=10
	OUTFLOW (CFS)	STORAGE (AC-FT)	ELEV(FT)
	0.0	0.0	58.5
	40.50	0.2085	59.0
	44.32	0.6635	60.0
	47.87	1.1965	61.0
	51.19	1.8252	62.0
* * * * *	* * * *	* * * * *	
TIME INFLO	W ELEV	VOLUME OUTFLOW	
(HRS) (CFS)	(FEET)	(AC-FT) (CFS)	
0.00 0.0	0 58.50	0.000 0.00	
0.33 0.0	0 58.50	0.000 0.00	

```
58.50
    0.67
              0.00
                                0.000
                                          0.00
                      58.50
                                          0.12
    1.00
              0.16
                                0.001
                      58.57
                                          5.98
    1.33
             11.78
                                0.031
                      60.00
             48.45
                                0.662
                                         44.31
    1.67
                      58.77
                                0.111
                                         21.47
    2.00
              7.55
    2.33
                      58.54
                                0.018
                                          3.57
              2.93
                      58.52
                                0.007
              1.17
                                          1.41
    2.67
                                0.003
                                          0.59
                      58.51
              0.49
    3.00
                                0.001
                                          0.25
                      58.50
              0.22
    3.33
                                          0.12
                      58.50
              0.10
                                0.001
    3.67
                      58.50
                                          0.05
                                0.000
    4.00
              0.04
                      58.50
                                0.000
                                          0.03
    4.33
              0.03
                      58.50
                                0.000
                                          0.02
    4.67
              0.01
                                0.000
                                          0.02
                      58.50
    5.00
              0.02
                                          0.02
                      58.50
                                0.000
    5.33
              0.02
                                          0.02
    5.67
                      58.50
                                0.000
              0.02
    6.00
              0.02
                      58.50
                                0.000
    6.33 0.00 58.50 0.000 0.00
PEAK DISCHARGE = 44.310 CFS - PEAK OCCURS AT HOUR 1.67
MAXIMUM WATER SURFACE ELEVATION = 59.997
MAXIMUM STORAGE = 0.6624 AC-FT INCREMENTAL TIME= 0.033333HRS
* S
          ID=30
                           CODE=1
PRINT HYD
```

HYDROGRAPH FROM AREA POND.001

RUNOFF VOLUME = 1.19953 INCHES = 2.4130 ACRE-FEET PEAK DISCHARGE RATE = 44.31 CFS AT 1.667 HOURS BASIN AREA = 0.0377 SQ. MI.

*S FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 12:44:30

Ahymo2.txt

CTADT	Ahymo2.txt TIME=0 PUNCH=0 PRINT LINES=-6
START *S COMPUTE 100	YR. 6 HR. HYDROGRAPHS FOR Folium Energy Solar
	MO.txt - HYMO PER COA DPM CHPT 22.2
*S *C	
LOCATION	ALBUQUERQUE
*	
RAINFALL	TYPE=-1 RAIN QUAR=0 RAIN ONE=2.14 RAIN SIX=2.60
IVATIMI ALL	RAIN DAY=3.10 DT=0.0333333
*S	
*S COMPUTE RUNOFF F	OR EXISTING CONDITIONS
*<	
*S *S	
	TE NOT USED AT THIS TIME
COMPUTE NM HYD	ID=41 HYD NO= 141.1 DA=0.036311 SQ MI PER A=0 PER B=50 PER C=50 PER D=0 TP=133
	RAIN=-1
PRINT HYD	ID=41 CODE=1
*S *S	
*S BASIN B - CURRE	ENT PROPOSED SITE
COMPUTE NM HYD	ID=42 HYD NO= 142.1 DA=0.021105 SQ MI PER A=0 PER B=100 PER C=0 PER D=0 TP=133
	RAIN=-1
PRINT HYD	ID=42 CODE=1
*S *S	
_	TTE EAST OF SITE - PREVIOUSLY DISTURBED
COMPUTE NM HYD	ID=43 HYD NO= 143.1 DA= 0.016613 SQ MI
	PER A=50 PER B=50 PER C=0 PER D=0 TP=133 RAIN=-1
PRINT HYD	ID=43 CODE=1
*S *S	
	TTE - PNM SUBSTATION AND CELL PHONE SITEL
-	ID=44 HYD NO= 144.1 DA=0.013828 SQ MI
	PER A=0 PER B=50 PER C=50 PER D=0 TP=133 RAIN=-1
PRINT HYD	ID=44 CODE=1
*S *S	
~> *	
	DISCHARGE FROM BASINS C (OFFISTE) and
*S B (SITE OF THIS	5 PROJECT)
	n 1

			Ahymo2.txt
*ADD HYD		NO= 120.1 ID I=42	ID II=43
*S PRINT HYD *S		CODE=1	
*S COMPUTE RUNOFF FO			
*S			
*S BASIN A - ON-SIT COMPUTE NM HYD	ID=1 HYD	AT THIS TIME NO= 101.1 DA=0.0 R B=50 PER C=50 PER	
PRINT HYD *S *S	ID=1	CODE=1	
*S BASIN B - CURREI	NT PROPOSED	SITE	
COMPUTE NM HYD	ID=2 HYD PER A=0 PER RAIN=-1	NO= 102.1 DA=0.0 R B=0 PER C=95.7 I	021105 SQ MI PER D=4.3 TP=133
PRINT HYD *S *S	ID=2	CODE=1	
_	ID=3 HYD	SITE - PREVIOUSLY I NO= 103.1 DA=0.0 ER B=50 PER C=0 PI	016613 SQ MI
PRINT HYD *S *S	_	CODE=1	
*S BASIN D - OFFSI COMPUTE NM HYD	ID=4 HYD	BSTATION AND CELL INO= 104.1 DA=0.0 R B=50 PER C=50 PER	013828 SQ MI
PRINT HYD *S *S	ID=4	CODE=1	
*s TOTAL RUNOFF RO			OFFSITE
ADD HYD *S	ID=20 HYD	NO= 120.1 ID I=2	ID II=3
*s TOTAL RUNOFF RO	UTED TO PON	D 	
PRINT HYD *S	ID=20	CODE=1	

rOUTE RESERVOIR	ID=30 HYD=F	AŁ POND.001 INFLOW ID=2	nymo2.txt 20 CODE=10
		STORAGE(AC-FT)	ELEV(FT)
	0.0	0.0	58.5
	40.50	0.2085	59.0
	44.32	0.6635	60.0
	47.87	1.1965	61.0
	51.19	1.8252	62.0
*S			
PRINT HYD *S FINISH	ID=30	CODE=1	

Culvert Calculator Report Pond Storm Drain

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	62.00	ft	Headwater Depth/Height	4.29	
Computed Headwater Eleva	62.00	ft	Discharge	51.19	cfs
Inlet Control HW Elev.	57.29	ft	Tailwater Elevation	51.59	ft
Outlet Control HW Elev.	62.00	ft	Control Type	Outlet Control	
Grades		· •			
Upstream Invert	51.28	ft	Downstream Invert	49.81	ft
Length	396.00	ft	Constructed Slope	-0.001263	ft/ft
Hydraulic Profile					
Profile CompositeA2Pres	ssureProfile		Depth, Downstream	2.31	ft
Slope Type	Adverse		Normal Depth	N/A	ft
Flow Regime	Subcritical		Critical Depth	2.31	ft
Velocity Downstream	10.79	ft/s	Critical Slope	0.011497	ft/ft
Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Sections Matter to HDPE (Smo	oth Interior)		Span	2.50	ft
Section Size	30 inch		Rise	2.50	ft
Number Sections					
Outlet Control Properties					
Outlet Control HW Elev.	62.00	ft	Upstream Velocity Head	1.69	ft
Ke	0.50		Entrance Loss	0.85	ft
Inlet Control Properties					
Inlet Control HW Elev.	57.29	ft	Flow Control	N/A	
Inlet Type Square edge	w/headwall		Area Full	4.9	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
С	0.03980		Equation Form	1	
Υ	0.67000				

Rating Table Report Pond Storm Drain

Range Data:	•		· · ·	
	Minimum	Maximum	Increment	
Allowable HW E	58.50	62.00	0.50	ft

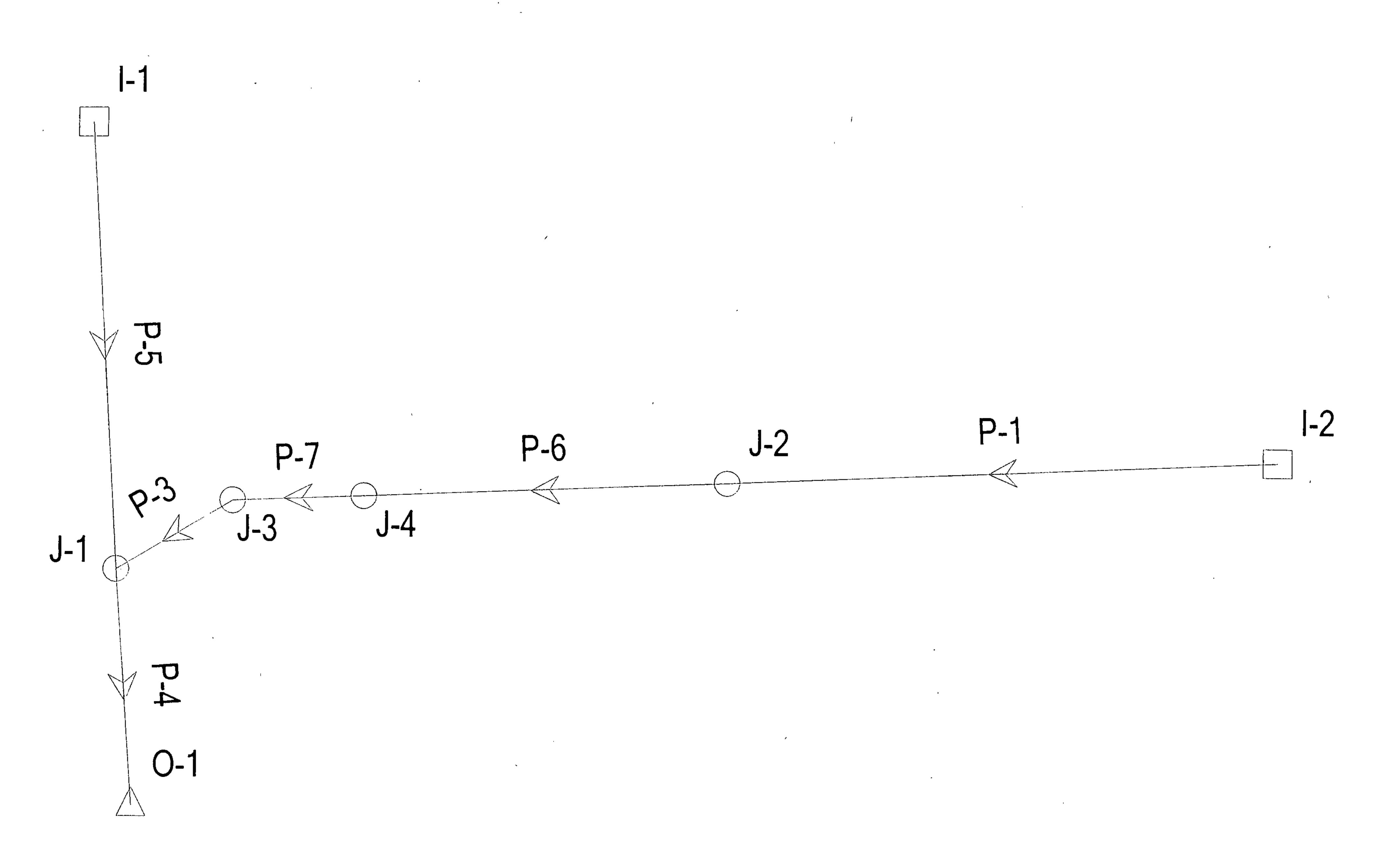
HW Elev. (ft)	Discharge (cfs
58.50	38.48
59.00	40.50
59.50	42.45
60.00	44.32
60.50	46.12
61.00	47.87
61.50	49.55
62.00	51.19

POND VOLUME ONSITE DETENTION

POND BOTTOM WS (FT) (F			FACE A (SQFT)	INCRIMENTAL VOLUME(cf)	TOTAL VOLUME (cf)	
58.5	58.5	0	17723		0	
				9,083		
58.5	59	0.5	18610		9,083	
				19,820		
58.5	60	1.5	21030		28,903	
				23,216	·	
58.5	61	2.5	25401		52,119	
30.5	0 1	2.0	20101	27,388	•	
E0 E	60	2 5	20274	27,300		
58.5	62	3.5	29374		79,506	

APPENDIXB

Storm Cad Printouts



Scenario: Base

DOT Report

Label	-Node- Upstream Downstream	Inlet	Upstream Inlet CA (acres)	pstream Calculate System CA (acres)	Upstream	-HGL- Upstream Downstream (ft)	Discharge	Shape	Length (ft)	Average Velocity (ft/s)	Description
P-3	J-3	N/A	N/A	0.00	56.50	42.99	43.50	Circular	6.00	4.52	
	J-1				56.50	42.98	688.48	42 inch			
P-4	J-1	N/A	N/A	0.00	56.50	41.61	706.50	Circular	1.00	122.36	
	O-1				54.00	38.38	5,291.87	108 inch			
P-5	I-1	0.00	0.00	0.00	58.00	44.39	663.00	Circular	500.00	10.42	
	J-1				56.50	42.98	0.00	108 inch			
P-1	1-2	0.00	0.00	0.00	59.00	56.74	43.50	Circular	396.20	8.86	
	J-2				56.50	52.29	28.92	30 inch			
P-6	J-2	N/A	N/A	0.00	56.50	51.51	43.50	Circular	297.00	12.71	
	J-4				56.00	45.30	56.57	30 inch			
P-7	J-4	N/A	N/A	0.00	56.00	45.66	43.50	Circular	94.00	12.80	
	J-3				56.50	43.34	57.07	30 inch			

Scenario: Base

Junction Report

Label	Calculated Station (ft)	Elevation (ft)	Set Rim Equal to Ground Elevation?	(ft)	Sump Elevation (ft)			Description	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
J-1	0+01	56.50	true	56.50	35.03	false	12.00		42.98	41.61
J-3	0+07	56.50	true	56.50	37.84	false	6.00		43.65	42.99
J-4	1+01	56.00	true	56.00	43.46	false	6.00		45.66	45.66
J-2	3+98	56.50	true	56.50	49.31	false	6.00		52.29	51.51

Scenario: Base

Node Report

Label	Known Flow (cfs)		Ground Elevation (ft)		•	Hydraulic Grade Line Out (ft)	Intensity	Local Rational Flow (cfs)
0-1		706.50	54.00	54.00	33.53	33.53		
J-1		706.50	56.50	56.50	42.98	41.61		
J-3		43.50	56.50	56.50	43.65	42.99		
I-1	663.00	663.00	58.00	58.00	44.39	44.39	0.00	0.00
J-4		43.50	56.00	56.00	45.66	45.66		
J-2		43.50	56.50	56.50	52.29	51.51		:
1-2	43.50	43.50	59.00	59.00	56.74	56.74	0.00	0.00