



October 26, 2012

Pennsylvania Department of Environmental Protection
Bureau of District Mining Operations
286 Industrial Park Road
Ebensburg, PA 15931-4119
Attention: Michael Timcik, P.G.
Hydrogeologist

Subject: NPDES Permit Renewal
SMIP No. 6477SM5
Hamilton & Washington Townships
Adams and Franklin Counties

Dear Mr. Timcik:

On behalf of Specialty Granules Inc (SGI), URS is responding to the Pennsylvania Department of Environmental Protection, (PADEP) comment letter dated July 13, 2012 concerning the NPDES Permit Renewal for the above referenced subject. This letter provides URS' response to PADEP's July 13, 2012 comment letter. The attached NPDES Permit No. PA0009059 Application Final Addendum Report dated October 25 is considered comprehensive and complete to address all of PADEP's comments on this matter, including the original PADEP comment letter dated April 25, 2012. The attached report replaces URS' prior response submittal dated May 24, 2012, as some calculations and conclusions have been revised to reflect the entire scope of comments received from PADEP.

To assist in your review, PADEP comments from the July 13, 2012 comment letter are presented in bold *italic* type with URS corresponding responses in plain type text.

Section 2 – Project Description

- 1.) Please provide the flow rates of the discharges for the Lower Mill system, pond # 3. Presently you are showing the 8" CMP discharges. However, with the water surface elevation of 931.8 and the top of the riser to be 931.78 the 8" CMP should have a continuous discharge, but no flow rates were provided.***

There is no continuous discharge through the 8-inch CMP vertical riser. The 931.78 elevation represents the top of the intake riser for the primary discharge pipe, which is not perfectly horizontal. The water surface elevation is rounded to 931.80. Please refer to the NPDES Permit No. PA0009059 Application Addendum Report included with this submission.

- 2.) Please provide the flow rates from the seeps.***

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Seep flow rates have not been accurately measured, but will be monitored regularly (see Section 4 of attached report) once monitoring flumes are installed. Preliminary and initial field estimates of flow from these seeps during field observation in August 2012 ranged from approximately 2 to 10 gallons per minute depending on the location. We will provide measured flow rates once approval is received of the proposed seep monitoring plan.

Section 3 – Computations

- 1.) Please clarify how the Lower Mill Pond System qualifies for a dam permit waiver as provided for a Chapter 105, Section 12 – Waiver of Permit Requirements under Paragraph 6. Does the Lower Mill Pond System meet all the requirements of Chapter 102 as it relates to erosion and sediment control? Does the Lower Mill Pond System have a design emergency spillway that meets the Chapter 102 requirements? Do the ponds have dewatering pipes to lower the pond elevation to the sediment storage level to allow sufficient storage volume? If the ponds are always full at the elevations noted on the As-Built Plan for Sediment Ponds 2 and 3 – June 2011, then the ponds do not meet the required storage volume of 5,000 cubic feet per acre. Are the ponds certified by a professional engineer or registered land surveyor? Please provide this information to justify the Lower Mill Pond System meets all Chapter 102 requirements.***

The Lower Mill Pond System qualifies for a waiver under subsection “(6) A water obstruction or encroachment located in, along, across or projecting into a stormwater management facility or an erosion and sedimentation pollution control facility which meets the requirements in Chapter 102 (relating to erosion and sediment control), if the facility was constructed and continues to be maintained for the designated purpose.”

The existing three (3) pond system has been operating as a sediment control facility for over 30 years at the Charmian Facility. The system will be upgraded to meet the criteria as contained in the current Chapter 102 requirements for design and operation of a sediment control facility with the minor modifications summarized below. A more detailed description is contained in the NPDES Application Addendum Report attached hereto.

- Pond 2 will be improved to include a spillway that can convey the Chapter 102-required 391-cfs (2cfs x Inflow Drainage Area) with 2-ft of freeboard. The freeboard is measured from the provided discharge water surface elevation to the top of bank. Pond 3 will be improved to include installation of a 75-ft spillway at an elevation of 942. With the proposed modifications to Ponds 2 & 3, the required discharge capacity will be met and the existing embankments will not have to be raised. Please reference the Addendum Report included with this submission for the design calculations and details.
- The Ponds have more storage volume than 5,000 cf per acre. The maximum drainage area to Ponds 2 & 3 is 195.5-acres. The natural drainage area to Ponds 2 and 3 is 190.5-acres. The additional 5.0-acres are added to account for the pumping of Pitts Pond, Sediment Traps 6 and 7, and Pitts Quarry to Ponds 2 and 3. (The maximum combined pumping rate from Pitts Pond, Sediment Traps 6 and 7, and Pitts Quarry is 4,100-GPM. The total 4,100-GPM equates to 9.14-cfs. Using the Chapter 102 requirements for discharge capacity of 2-cfs per drainage acre, the additional 9.14-cfs equates to 5.0 additional acres.)

In accordance with the Chapter 102 sediment basin design requirements, a total settling storage volume of 5,000 cubic feet, (cf) per acre and sediment storage volume of 1,000 cf per disturbed acre need to be provided. Therefore for the 195.5 acre drainage area, 977,500-cf of settling volume and 195,500-cf of sediment storage volume must be provided. However, SGI has designed sediment storage volume at five times larger than the requirements of Chapter 102. Therefore, the minimum sediment storage volume multiplied by five is 977,500-cf. resulting in a total storage volume of **1,955,000-cf**. The three-pond system with proposed improvements provides a total storage volume of **1,985,175-cf** which meets and exceeds the Chapter 102 requirements. Please reference the Addendum Report included with this submission for the design calculations and details.

- Also, a dewatering device will be installed in Pond 2 capable of dewatering Pond 2 to the sediment storage elevation within 4 to 7 days after a rainfall event. Please reference the Addendum Report included with this submission for the design calculations and details.
- Pond 3 has not been used in calculations to meet the storage requirements of the Chapter 102 regulations since Pond 2 provides sufficient total storage volumes. Pond 3 will be used as a final treatment/"polishing" pond. Please reference the Addendum Report included with this submission for the design calculations and details.
- Upon construction of the proposed improvements, the "As-Built" Plans will be certified by a professional engineer or registered land surveyor and provided to PADEP.

Section 4 – Conclusions

1.) Until weirs are constructed downstream of Sediment Basin # 3 outfalls and dates and flow rates provided it is hard to determine the average monthly discharge rate required for the NPDES permit.

SGI plans to construct measurement flumes at three locations downstream of Pond No. 3 to monitor flow discharges. Figure 3 in the attached report is a plan view and construction details of the proposed weir locations for review.

2.) Please clarify how SGI personnel will know what flow rate they will pump to the Lower Mill Pond System. Do you have a flow gauge on the pumps to determine the correct flow rates? Please provide the pump models, horsepower and pumping curves to show the correct flow rates at which these pumps will perform. Please show all pipeline losses and sizes for the flow designs.

SGI has provided the most relevant of the requested pump data information in the attached design report, assuming pumps can operate at capacity to provide the maximum discharge rate for O.D. facilities proposed to be pumped to the Lower Mill pond system. Flow meters will be installed for each pumped discharge to measure and report actual pumped flow rates as required by the NPDES permit monitoring requirements.

We trust that these responses adequately address your comments.

If you have any questions concerning our responses, please let us know.



Sincerely,

URS Corporation

A handwritten signature in black ink, reading "Mark D. Pennell".

Mark D. Pennell
Vice President, Office Manager

NPDES PERMIT NO. PA0009059 APPLICATION FINAL ADDENDUM REPORT

**Charmian Facility
Hamiltonban Township,
Adams County, Pennsylvania**

Prepared for:

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URS Project No. 20498083

October 26, 2012

Mark D. Pennell, Vice President

Table of Contents

Section 1	Introduction	1
1.1	BACKGROUND AND EXISTING CONDITIONS	1
1.2	NPDES PERMIT RENEWAL AND COMMUNICATIONS WITH PADEP	2
1.3	PURPOSE OF THIS REPORT	3
Section 2	Project Description	4
2.1	EXISTING CONDITIONS	4
2.2	PROPOSED IMPROVEMENTS UNDER CHAPTER 102	5
Section 3	Computations	6
3.1	DRAINAGE AREAS	6
3.2	STORMWATER DISCHARGE	6
3.3	PUMPED DISCHARGE	6
3.3.1	Pitts Pond	7
3.3.2	Pitts Quarry Sump	7
3.3.3	Sediment Traps 6 and 7	7
3.3.4	Summary of Pumped Discharge	7
3.4	LOWER MILL POND SYSTEM CAPACITY	7
3.4.1	Proposed Modifications to Ponds 2 and 3	8
3.4.2	PADEP Chapter 102 Requirements	8
3.4.3	Calculated Capacities Compared to Chapter 102 Requirements	10
Section 4	Monitoring	12
4.1	EXISTING NPDES MONITORING	12
4.2	PROPOSED NPDES MONITORING	12
Section 5	Conclusions	12
Section 6	References	14

List of Figures and Appendices

Figures

Figure 1	Site Location Map
Figure 2	Drainage Area Map
Figure 3	Proposed Pond Improvements
Figure 4	Proposed Section View
Figure 5	Typical Details for Monitoring Flumes F-1 Through F-3

Appendices

Appendix A	NPDES Permit No. PA0009059 and PADEP Comment Letters
Appendix B	Manufacturer's Flocculant and Coagulant Product Information
Appendix C	PADEP Chapter 102 Requirements & Stormwater Runoff/Capacity Calculations

1.1 BACKGROUND AND EXISTING CONDITIONS

Specialty Granules Inc. (SGI) (formerly ISP Minerals Inc.) operates a non-coal surface mine to obtain metabasalt for manufacturing roofing granules at its Charmian Facility located in Hamiltonban Township, Adams County (Figure 1). The Charmian operation is located here due to the unique underlying bedrock geology that occurs in a regionally narrow southwest to northeast band in this area.

Surface water runoff from the site is controlled through a series of stormwater and sedimentation management features including drainage swales and pipeline conveyance systems that pass through multiple sedimentation pond/clarifier systems. The site discharge is permitted with three outfalls under the National Pollutant Discharge Elimination System (NPDES) as part of the quarry's Noncoal Surface Mining Permits, Pennsylvania Department of Environmental Protection (PADEP) Permit Surface Mining Permit No. 01930302 (Pitts Quarry) and 6477SM5 (West Ridge Quarry).

Two NPDES permitted outfalls (Outfall 001 and 002 at Pitts Pond) discharge under NPDES Permit No. PA0223239 to an unnamed tributary to Toms Creek in the northern portion of the property. The third permitted outfall (Outfall 001 at the Lower Mill three-pond system) discharges under NPDES Permit No. PA0009059 (presented in Appendix A) to Miney Branch, which is subsequently a tributary to Toms Creek approximately 4.5-miles east/southeast of the facility.

The major natural drainage areas included in each NPDES permit are identified on Figure 2 as “Lower Mill Natural Drainage Area” and “Drainage Area to Pitts Pond”. These major drainage areas include sub-drainage areas, identified and comprising the identified drainage areas, in acres, as follows. Figure 2 shows the natural drainage area boundaries for each sub-drainage area within the limits of the mining and NPDES permits. Each sub-drainage area is currently routed to the outfalls for each respective NPDES permit as described below. It is important to note that although the natural drainage area to Pitts Quarry is in the Pitts Pond natural drainage, stormwater captured in Pitts Quarry and Pitts Pond has always been permitted to be pumped to the Lower Mill three-pond system as an “Other Drainage (O.D.) facility:

- A. Drainage to Lower Mill three-pond system (NPDES PA0009059) = 190.5 acres + pumped discharge from Pitts Quarry O.D.
 - 1. Lower Mill Natural Drainage Area = 190.5 acres
 - 2. Pitts Quarry = 70.2 acres (OD discharge limited by pump and conveyance line capacities)
- B. Proposed Pumped Drainage Areas to Lower Mill System = 106.5 acres
 - 1. Pitts Pond = 38.0 acres
 - 2. Advance Area = 47.6 acres
 - 3. Sediment Trap 6 & 7 = 20.9 acres
- C. West Flank Permit Application under Development = 25.7 acres, (maximum)

The runoff from the Lower Mill area (190.5 acres) is managed through a three-pond system which is permitted under Chapter 102 as a permanent Erosion and Sediment Pollution Control

Section 1

Introduction

Facility. SGI regularly withdraws water from Pond 3 of the three-pond system for use in their production process. Currently, runoff from Pitts Quarry (70.2 acres) is managed through an Erosion and Sediment Pollution Control Facility and is periodically pumped as necessary to the Lower Mill three-pond system as provided in the current NPDES permit. Runoff from Pitts Pond (38.0 acres) and the Advance Area (47.6 acres) is collected at the permanent Pitts Pond and periodically pumped to the Lower Mill three-pond system as necessary to limit discharge to the un-named tributary to Toms Creek. Runoff from Sediment Traps 6 and 7 (20.9 acres) will be directly pumped to the Lower Mill three-pond system.

Currently, approximately half of the drainage area referred to as West Flank (25.7 acres) is not part of the stormwater management system in the Pitts Pond drainage area, but is being considered for future development and will be incorporated into that stormwater management system, which will ultimately be pumped to the Lower Mill three-pond system.

1.2 NPDES PERMIT RENEWAL AND COMMUNICATIONS WITH PADEP

In August 2011, SGI submitted an application for renewal of its NPDES permit No. PA0009059 to PADEP. On September 8, 2011, SGI received a letter response from PADEP stating that at certain times of the year the discharge water flow rate at the Lower Mill three-pond system is exceeding the maximum monthly average discharge flow rate under the permit. This conclusion was based upon the monthly reports submitted by SGI based upon instantaneous flow measurement results. The September response from PADEP requested that SGI submit a request to revise the current permit to account for higher potential discharge flow rates. For clarification, the referenced discharge rate of 0.1 MGD only applies to pumped discharges from “other discharges” (proposed pumping from drainage areas “B” and “C”) it is not a total cap on the site discharge water flow rate.

The PADEP response also requested that SGI provide a thorough evaluation of the design for the current system in order to establish that it is capable of handling higher discharge flow rates while at the same time consistently maintaining water quality that is compliant with the permitted effluent limits. A copy of the September 8, 2011 PADEP letter to SGI is provided in Appendix A.

SGI and URS met with PADEP on September 27, 2011 to determine the necessary considerations to be included in this submittal to support an increase in the permitted other discharge flow rate. It was also requested by PADEP that SGI include additional information to confirm that sufficient capacity exists in the Lower Mill three-pond system to effectively handle additional stormwater to be pumped to the Lower Mill system from adjacent permitted area SMP No. 01930302 (“Pitts Drainage”) from the Pitts Pond and Pitts Quarry. SGI historically pumps stormwater from the active Pitts Quarry and Pitts Pond to the Lower Mill system, and is proposing to continue to periodically pump additional stormwater from Sediment Traps 6 and 7 to the Lower Mill system.

It is important to note that a review of reported water quality indicates that historically water quality discharge limits as specified in the existing NPDES have not been exceeded.

In response to the PADEP comment letter dated September 8, 2011, URS prepared a response, including supporting calculations and design report that was submitted on January 5, 2012 to PADEP to address the September 8, 2011 comments.

Section 1

Introduction

PADEP issued a follow-up comment letter dated April 25, 2012 that is also included in Appendix A that requested further clarification regarding the Lower Mill ponds. The response included in this report and accompanying response letter addresses all PADEP comments and is considered a complete and stand-alone response to address all PADEP comments from both of their comment letters. As such, the previous report submitted January 5, 2012 is superseded by this submittal.

1.3 PURPOSE OF THIS REPORT

This addendum report addresses a required revision to the pumped discharge limit from OD to Outfall 001 of NPDES Permit No. PA0009059, verifies sufficient storage capacity for sediment and stormwater to support the proposed change to the OD discharge limit, demonstrates compliance of the system with Chapter 102 requirements (based upon minor improvements recommended in this report), and provides additional and improved monitoring.

Currently the NPDES permit has a monthly average discharge rate of 0.1 million gallons per day (MGD) that applies to pumped discharge “other discharges (OD)”. The current discharge rate was established in 1981 and, as site development and operations have evolved since that time, this addendum report addresses a necessary change to the limit for potential pump discharge from “OD” at the facility.

Currently, the existing NPDES permit includes monthly monitoring of water quality of water discharged from outfall 001, which is comprised of two 8-inch diameter discharge pipes (referred to as eastern and western discharge pipes) as originally designed and approved under the permit. Water quality limits in the NPDES permit include; maximum concentration of total suspended solids (TSS) not to exceed 35 mg/l as the average during the month, 70 mg/l as the maximum daily average, 90 mg/l as the maximum instantaneous concentration, and pH in the range of 6.0 to 9.0 standard units (s.u.) at all times.

During discharges due to precipitation events up to the expected 10-year, 24-hour precipitation (4.80-inches), the discharge limit at outfall 001 is 0.5 ml/l for total settleable solids. SGI is not requesting any modifications to these monitoring requirements.

SGI also historically reports discharge rates from Outfall 001 based upon grab samples and has recently installed a continuous recording flow meter at the western discharge pipe, and is in the process of adding the same discharge measurement capability at the eastern discharge pipe that comprise total discharge for outfall 001. The current NPDES discharge rate limit of 0.1 MGD applies to only the pumped discharge from OD facilities. There is no discharge rate limit for Outfall 001 in the current NPDES Permit. In addition, SGI is adding three monitoring flumes (F-1, F-2, and F-3) to monitor discharge from the gravel drainage layer underlying the embankment of Pond 3. With the additional flow meters and monitoring flumes, SGI will be able to monitor all discharge from Pond 3.

SGI, through this permit renewal is requesting to update the pumped discharge rate from “OD”, and to improve NPDES monitoring and reporting.

Section 2

Existing and Proposed Conditions

The analysis contained in this addendum report considered the ability of the existing three pond system to effectively manage higher discharge flow rates, while maintaining existing permit discharge limits for water quality. As specified in the current NPDES permit, the pumped discharge rate from “OD” to the Lower Mill Erosion and Sediment Pollution Control Facility is permitted for an average monthly discharge flow rate of 0.1 MGD. This flow rate requires modification to reflect the actual maximum pumping rates of 5.9 MGD to be included in this NPDES renewal.

The two key components presented in this report to respond to PADEP comments and support the requested NPDES revisions are:

- a.) Performance of Lower Mill Erosion and Sediment Pollution Control Facility including the proposed pumped discharge under PADEP Chapter 102 regulations.
- b.) Subsequent system improvements and monitoring to support the changes under the NPDES Permit.

2.1 EXISTING CONDITIONS

Site runoff from the Lower Mill drainage area consists mainly of sheet flow that is collected in a series of channels, sediment traps and pipeline systems throughout the drainage area. The drainage area is a combination of quarry, wooded areas, brush, and some limited impervious areas that ultimately enters an existing interconnected three-pond sedimentation system through existing 48-inch and 36-inch diameter reinforced concrete pipelines (RCPs). The influent stormwater contains generally fine-grained sediment including some colloidal size crushed rock and other natural materials in suspension.

The Lower Mill three-pond system is designed to retain heavier, coarse-grained solids in Pond 1. In order to improve settlement of the suspended materials, coagulants and flocculants are added within a conveyance channel between Ponds 1 and 2 to the influent flow into Pond No. 2. Nalco 7192 is the primary flocculant that is used in tandem with coagulant, Nalco 8157. These amendments are applied at target rates of 7 parts per million (ppm) and 15 ppm, respectively. The application rates are adjusted by SGI personnel in order to improve performance based upon field testing and visual observation for floating solids or visible foam in other than trace amounts. Information from the manufacturer regarding these additions is provided in Appendix B.

Stormwater is then discharged from Pond 2 to Pond 3, currently via four 8-inch riser pipes, for the final solids settling stage. Discharge from Pond 3 is a passive controlled discharge through two 8-inch outfall pipes (Outfall 001) to Miney Branch.

The current NPDES permit requires the discharge from Outfall 001 to be no greater than 35 mg/L for TSS as an average monthly concentration, 70 mg/L maximum daily concentration, 90 mg/L instantaneous maximum concentration, and a pH in the 6 to 9 standard unit (s.u.) range at all times.

For discharges of surface runoff not subject to mechanical control that are a result of a precipitation event that occur within 24 hours of said precipitation event up to the 10-yr, 24-hour storm, the discharge limit is a maximum of 0.5 ml/l total settleable solids. For storm events exceeding the 10-year 24-hour storm, there are no discharge limits. A copy of the existing NPDES permit is included in Appendix A.

2.2 PROPOSED IMPROVEMENTS UNDER CHAPTER 102

SGI is planning to upgrade the existing Ponds 2 and 3 spillways to provide required storage volumes and emergency spillway requirements to meet the 2-cfs/acres discharge requirement under Chapter 102. Pond 2 will be improved to include a spillway that can convey 391-cfs (2cfs x Inflow Drainage Area) with 2-ft of freeboard. The freeboard is measured from the provided discharge water surface elevation to the top of bank. Pond 3 will be improved to include installation of a 75-ft spillway at an elevation of 942 ft amsl. With the proposed modifications to Ponds 2 and 3, the required discharge capacity will be met and the existing embankments will not have to be raised. Also, a dewatering device will be installed in Pond 2 capable of dewatering Pond 2 to the sediment storage elevation within 4 to 7 days after a rainfall event.

The following sections of this application addendum provide data and supporting calculations to confirm the stormwater discharge quantities managed by SGI at the facility, evaluate the capacity of the existing stormwater management system, and analyze the ability to manage stormwater through the existing three-pond Lower Mill system under the existing water quality discharge limits.

The evaluation presented in the next several sections of this report demonstrate that sufficient capacity is available within the Lower Mill three-pond system following modification of the spillway to meet the requirements of PADEP Chapter 102, to effectively manage stormwater from both the Lower Mill and Pitts drainage areas based upon the revised pumped discharge limits.

There is no proposed change to the current water quality limits in the existing NPDES permit. Included, however, is a proposed plan to improve monitoring and reporting related to discharges from the three-pond Lower Mill outfall and the drainage blanket that underlies a portion of the embankment at Pond 3. The average discharge rate from “O.D.” facilities is proposed to be modified to meet current and future operational needs. A discussion of the proposed discharge rate of 5.9-MGD is described in Section 3.3.

Section 3 Computations and Stormwater Model Results

3.1 DRAINAGE AREAS

URS determined the existing tributary drainage area to the Lower Mill three-pond system and the drainage area from the adjacent NPDES Permit No. PA0223239 Pitts drainage area. The calculated drainage areas are previously summarized in Section 1, and the calculations are provided in Appendix C. The drainage from the Pitts drainage area collected in the Pitts Pond or Pitts Quarry will continue to be pumped into the Lower Mill Pond collection/conveyance system so there is very limited discharge of stormwater directly to Toms Creek. Mapping from an aerial survey conducted in 2011 was used to delineate each sub-drainage area and the total drainage area as shown on Figure 2.

Runoff calculations were performed utilizing the National Resources Conservation Service (NRCS), TR-55 methods in accordance with Hamiltonban Township, Section 1003, Standards for Storm Water Management. Calculations were then completed using HydroCAD software for the 10-year 24-hour storm event for the Natural Drainage, Pitts Drainage, and the Lower Mill Drainage areas. A time of concentration was calculated from the most remote point in the watershed to the influent to Pond No. 1. Runoff Curve Numbers (CN) were obtained from Technical Release (TR55) based upon surface conditions. A composite “CN” was calculated for use in determining the total runoff depth quantity. Copies of the drainage area, stormwater runoff, composite CN, and time of concentration calculations are included in Appendix C.

3.2 STORMWATER DISCHARGE

The design basis for the discharge evaluation is based upon calculation of the depth of runoff that can be expected to occur for a 10-year, 24-hour storm within the drainage basin. From the Hamiltonban Township, Stormwater Management Ordinance, a 10-year, 24-hour storm event produces 4.8 inches of runoff.

The 10-year, 24-hour storm discharge rate for the Natural Drainage Area (190.5-acres) is 776.08-cfs. The maximum discharge rate associated with the maximum pumped discharge from the Pitts Area is 9.14-cfs (4,100-GPM). Therefore, the total inflow to Ponds 2 and 3 is 785.22-cfs.

The existing conditions 10-year, 24-hour storm discharge rate from Pond 3 is 16.74-cfs at an elevation of 942.62. The proposed conditions 10-year, 24-hour storm discharge rate from Pond 3 following the modifications proposed in this letter is 29.94-cfs at an elevation of 942.62.

For conservative design criteria the calculations are based upon the Lower Mill Pond capacity discussed in Section 3.4, it is proposed that the Pitts drainage area will be pumped to the Lower Mill Pond system as described in Section 3.3 so that all site drainage is discharged through Outfall 001 of NPDES Permit No. PA0009059, and meets all Chapter 102 requirements. Under certain conditions, SGI will continue to discharge under the requirements of NPDES Permit PA 0223239.

3.3 PUMPED DISCHARGE

The drainage from the Pitts drainage area currently is collected either in the active Pitts Quarry, drainage to Pitts Pond, and drainage to Sediment Traps 6 and 7. The portion of the stormwater collected in the Pitts Quarry, Pitts Pond, and Sediment Traps 6 and 7 is then pumped to the Lower Mill Pond System. It is proposed that as necessary all drainage from the Pitts Drainage area will be pumped to the Lower Mill Pond System and discharged through Outfall 001 in

Section 3

Computations and Stormwater Model Results

accordance with the revised discharge limit for O.D. facilities. Pumping from the adjacent Pitts Quarry and Pitts Pond will be performed when necessary by SGI personnel as summarized below:

3.3.1 Pitts Pond

The Pitts Pond pumping system consists of a new electric pump system comprised of two pumps rated at 800-GPM each with a dedicated 12-inch diameter discharge line, and an existing electric/genset pump system comprised of one pump rated at 500-GPM with a dedicated 6-inch diameter discharge line.

The planned normal operation for pumping discharge from Pitts Pond to the Lower Mill system is to use the two new electric pumps at a maximum discharge rate of 1,600-GPM. The existing electric/genset pump system will remain in-place and will be used as a back-up so that both pumping systems could be operated in tandem for total maximum discharge capacity of 2,100-GPM from Pitts Pond, if needed. The hydrologic model was developed using 2,100-GPM for the Pitts Pond pumping rate.

3.3.2 Pitts Quarry Sump

The Pitts Quarry pumping system consists of a new electric pump system comprised of two pumps rated at 500-GPM, each with a dedicated 12-inch diameter discharge line, and an existing portable diesel backup pump rated at 950-GPM. The diesel pump is for backup only and will not be operated simultaneously.

The planned normal operation for pumping discharge from Pitts Quarry to the Lower Mill system will be to use the two new electric pumps at a maximum discharge rate of 1,000-GPM. The hydrologic model was developed using 1,000-GPM for the Pitts Quarry pumping rate.

3.3.3 Sediment Traps 6 and 7

Traps 6 and 7 will utilize a pump system rated for 1,000-GPM. The pump system will convey the discharge indirectly through existing drainage channels to Ponds 2 and 3. The hydrologic model included 1,000-GPM pumping capacity indirectly through existing drainage channels from Sediment Traps 6 and 7 to the Lower Mill.

3.3.4 Summary of Pumped Discharge

The planned normal operation of the three combined pumping systems provides a total pumping capacity of 4,100-GPM (9.14-cfs). This pumping rate of 4,100-GPM (5.9 MGD) from O.D. facilities represents the requested revision to the daily average discharge rate from O.D. facilities in the NPDES Permit. The hydrologic model was developed assuming that pumping from these three areas to the Lower Mill system will occur continuously even during the peak discharge from the Lower Mill drainage area.

The next section of this document discusses the storage and discharge capacities of the Lower Mill system.

3.4 LOWER MILL POND SYSTEM CAPACITY

The capacity of existing Ponds 2 and 3 was determined based upon a survey of the ponds completed in September 2011 by Brindle Associates, Inc. Calculations to determine the existing basin volumes are included in Appendix C. In order to model and evaluate the system capacity, the 10-year, 24-hour storm event was routed into the existing ponds with the proposed

Section 3

Computations and Stormwater Model Results

modifications presented below using HydroCAD software. Copies of the pond routing are included in Appendix C.

The volume calculations for sizing of sediment basins were completed in accordance with the PADEP criteria for sediment basin design as provided in the draft “Erosion and Sediment Control BMP Manual”, Technical Guidance No. 363-2134-008, 2010. Specifically, sediment basins are required to be sized for a dewatering zone of 5,000 cubic feet, (c.f.) for each acre tributary to the basin. An additional sediment storage zone of 1,000 c.f. per disturbed acre tributary to the basin is required. Pond 1 provides primary settling and as such, the stormwater storage capacity is limited and fluctuates depending upon the amount of sediment captured. Conservatively, with regard to stormwater retention, URS eliminated Pond 1 from its evaluation of the stormwater storage calculations under the 10-year, 24-hour storm event.

The existing three (3) pond system has been operating as a sediment control facility for over 30-years at the Charmian Facility. The three (3) pond system will meet the current requirements of the PADEP Chapter 102 with the minor modifications to Ponds 2 and 3 presented below, consisting of spillway upgrades and installation of a dewatering device in Pond 2. The following is an outlined summary of the proposed modifications to Ponds 2 and 3, PADEP Chapter 102 requirements, and PADEP Chapter 102 capacities. Figures 3 and 4 illustrate the existing and proposed conditions.

3.4.1 Proposed Modifications to Ponds 2 and 3

Pond 2 modifications include the following:

- Installation of 25-ft, 80-ft, and 50-ft spillways at an elevation of 942.50 (Top of Bank is 946.00) in the embankment between Ponds 2 and 3.
- Maintain the existing location and elevations of the existing two (2) 18-inch CMP culverts.
- Install Perforated Risers on the existing four (4) 8-inch CMP culverts to provide 4 to 7 day dewatering time.
- Restore any low points within the embankment to maintain a minimum elevation of 946.00. The design height of the embankment between Ponds 2 and 3 is not being modified.

Pond 3 modifications include the following:

- Installation of a 75-ft spillway at an elevation of 942.50 (Top of Bank is 946.00) in the southwest corner of the embankment associated with Pond 3.
- Maintain the existing location and elevations of the two (2) 8-inch CMP culverts and two (2) 18-inch CMP Culverts.
- Restore any low points within the embankment to maintain a minimum elevation of 946.00. The design height of the embankment for Pond 3 is not being modified.

3.4.2 PADEP Chapter 102 Requirements

The following provides a summary of the Chapter 102 requirements, calculations, and results (in bold type) of the modeling completed with the proposed modifications and change to pumped discharge rates from OD facilities.

Section 3 Computations and Stormwater Model Results

The equation for determining the total required storage volume under PA Chapter 102 is:

$$\text{Total Required Storage Volume (C.)} = \text{Settling Volume (A.)} + \text{5-year Sediment Volume (B.)}$$

The calculations for the requirements and capacities for each component of the equation follow:

- A. Settling Volume** = 977,500-cf (summarized below)
- Natural Drainage Area = 190.5-acres
 - Pumped Discharge = 9.14-cfs (4,100-GPM) (Equates to 5.0-acres using Chapter 102: 2cfs/acre)
 - 2,100-GPM Pump Rate from Pitts Pond
 - 1,000-GPM Pump Rate from Pitts Quarry
 - 1,000-GPM Pump Rate from Ponds 6 & 7
 - Revised Total Drainage Area to include pumped discharge = 195.5-acres
 - Settling Volume = 5,000-cf per Drainage Acre
 - $(195.5\text{-acres} * 5,000\text{-cf}) = 977,500\text{-cf}$

The total settling volume provided in Pond 2 (from model) with modifications equals 985,175-cf, and is greater than the Chapter 102-required settling volume of 977, 500-cf.

B. Total 5-year Sediment Storage Volume = 977,500-cf

- Sediment Volume = 1,000-cf per Drainage Acre
 - $(195.5\text{-acres} * 1,000\text{-cf}) = 195,500\text{-cf}$
- 5-year Volume = $(5 * 195,500\text{-cf}) = 977,500\text{-cf}$
- Assuming 100% disturbed (conservative)

The total 5-year sediment storage volume provided in Pond 2 (from model) with modifications equals 1,000,000-cf, which is greater than the Chapter 102-required 5-year sediment storage volume of 977, 500-cf.

C. Total Required Storage Volume = 1,955,500-cf

The total storage volume provided in Pond 2 (from model) with modifications equals 1,985,175-cf, which is greater than the Chapter 102-required total storage volume of 1,955,500-cf.

Finally, the following summarizes the revised discharge capacity of the revised spillways based upon the proposed modifications.

D. Total Discharge Capacity = 391-cfs

- Total Discharge Capacity = 2-cfs per Drainage Acre
- $(2\text{-cfs} * 195.5\text{-acres}) = 391\text{-cfs}$

Section 3

Computations and Stormwater Model Results

- Minimum 24-inches of Freeboard between Top of Bank and 2-cfs/acre Discharge W.S.E.

The discharge capacity provided with the emergency spillway modifications equals 775.73-cfs, which is greater than the Chapter 102-required discharge capacity of 391-cfs.

3.4.3 Calculated Capacities Compared to Chapter 102 Requirements

The following summary of the modeled results demonstrates that Proposed Pond 2 (not including Pond 3) meets PADEP Chapter 102 Requirements for total storage (sediment and settling) and discharge capacity:

- Sediment Storage Elevation = 932.50 (surveyed)
 - Lowest surveyed 8-inch CMP Culvert w/Perforated Riser @ 932.50
 - Pond 2 Elevation 932.50 **Provides 1,000,000-cf > 977,500-cf; OK**
- Total Storage Elevation = 941.47 (surveyed)
 - Lowest surveyed 18-inch CMP Culvert @ 941.47
 - Pond 2 Elevation 941.47 **Provides 1,985,175-cf > 1,955,000-cf; OK**
 - Pond 2 Elevation 941.47 **Provides 14,849,109-gallons > 14,623,400-gallons; OK**
- Total Discharge Capacity = 775.73-cfs
 - At Elevation 944.00 (2-ft Below Top of Bank) the proposed 25-ft, 80-ft, and 50-ft spillways and (2) 18-inch CMP Culverts **can convey 775.73-cfs > 391-cfs; OK**

The table below depicts the existing and proposed peak water-surface elevations (W.S.E.) for a 10-year 24-hour storm event in Ponds 2 and 3:

	Existing 10-yr W.S.E (ft @ msl)	Proposed 10-yr W.S.E (ft @ msl)	Embankment Elevation (ft @ msl)	Spillway Invert Elevation (ft @ msl)
Pond				
2	945.98	943.77	946.00	942.50
3	942.62	942.62	946.00	942.50

Note: 24-inches of freeboard is required for the peak water-surface elevation associated with the 10-year storm event. Therefore, the peak W.S.E. must be at or below an elevation of 944.00

The supporting calculations associated with the requirements of PADEP Chapter 102 and pond models are provided in Appendix C. Figures 3 and 4 depict the proposed improvements associated with Ponds 2 and 3. Tables 1 and 2 on Figure 4 depict the PADEP Chapter 102 requirements and peak water surface elevations for various design storms.

The routing indicates that the three-pond system can safely pass a 10-year (4.8 inches), 24-hour storm event for the Lower Mill and the Pitts drainage areas without overtopping the pond embankment and the increased discharge capacity provides necessary freeboard to meet Chapter 102 requirements.

Section 3

Computations and Stormwater Model Results

The results of this evaluation indicate that with the proposed modifications, Ponds 2 and 3 meet all Chapter 102 requirements and that the discharge rate for pumped discharged from O.D. facilities from Pitts Quarry, Pitts Pond, and Sediment Traps 6 and 7 to the Lower Mill Pond system can be increased to 5.9 MGD from its current 0.10 MGD permit value and comply with the Chapter 102 requirements as currently required by the NPDES permit.

4.1 EXISTING NPDES MONITORING

Currently, the existing NPDES permit includes monthly monitoring of water quality of water discharged from outfall 001, which is comprised of two 8-inch diameter discharge pipes (referred to as eastern and western discharge pipes) as originally designed and approved under the permit. Water quality limits in the NPDES permit include; maximum concentration of total suspended solids (TSS) not to exceed 35 mg/l as the average during the month, 70 mg/l as the maximum daily average, 90 mg/l as the maximum instantaneous concentration, and pH in the range of 6.0 to 9.0 standard units (s.u.) at all times.

During discharges due to precipitation events up to the expected 10-year, 24-hour precipitation (4.80-inches), the discharge limit at outfall 001 is 0.5 ml/l for total settleable solids. SGI is not requesting any modifications to these monitoring requirements.

SGI also historically reports discharge rates from Outfall 001 based upon grab samples and has recently installed a continuous recording flow meter at the western discharge pipe, and is in the process of adding the same discharge measurement capability at the eastern discharge pipe that comprise total discharge for outfall 001. For discharges of surface runoff not subject to mechanical control that are a result of a precipitation event that occur within 24 hours of said precipitation event there is no discharge rate limit for outfall 001 in the current NPDES Permit. By adding the additional flow meters and monitoring flumes, SGI will be able to monitor all discharge from Pond 3.

4.2 PROPOSED NPDES MONITORING

As part of the Lower Mill pond embankment improvements made in 1981, a gravel drainage layer was installed at the base of the embankment for Pond 3 to allow for seepage to alleviate potential buildup of pore pressure in the embankment. This is a standard design practice for this type of feature (see URS' letter to PADEP dated September 26, 2012 in Appendix A).

SGI proposes to install three flumes, the locations of which are shown on Figure 4. The monitoring flumes (F-1 through F-3) will be constructed as shown on Figure 5, and will be sized according to maximum expected flow. These locations were chosen based upon observed discharge from the drainage layer through multiple site inspections conducted between July 2012 and October 2012 representing variable runoff conditions. Flume locations F-1 through F-3 will effectively measure the discharge from this drainage layer. Discharge will be measured daily and tracked for trends over time as a measure of determining the effectiveness of the drainage layer.

In addition, SGI proposes additional flow monitoring to measure the pump discharge from O.D. facilities by installing flow meters on each separate pumped discharge prior to its discharge to the Lower Mill Ponds. These flow measurements will be made for each month and the total discharge will be divided by the number of days in the month to provide a daily flow rate for comparison to the revised limit of 5.9-MGD.

Based upon the modeling and proposed modifications for the contributing Lower Mill and Pitts drainage areas, there is sufficient storage volume to ensure that the Lower Mill Pond System meets Chapter 102 requirements.

Worst case modeling of the 10-year, 24-hour storm also indicates that the Lower Mill system has sufficient capacity to manage stormwater effectively under the 10-year, 24-hour scenario, where

Section 5

Conclusions

drainage from the Pitts drainage is pumped at the maximum pumping rate of 4,100-GPM continuously before, during, and after the peak of the storm from the Lower Mill drainage, without any risk of overtopping the Pond 2 or Pond 3 embankments. Based upon that model, there is also significant additional storage capacity at the modeled rates.

Typically, SGI personnel will initiate pumping up to the maximum normal pumping rate of 4,100-GPM. Once pumping is initiated by SGI personnel, SGI will closely monitor the levels in the three-pond system and adjust pumping rates as necessary to ensure the pond is not overtopped. In order to comply with the water quality discharge requirements, SGI will monitor, sample and field test the discharge to ensure that proper detention time for chemical amendments is being achieved and water quality limitations are in compliance with the NPDES permit. SGI will adjust pumping and/or chemical feed rates as necessary for compliance with the NPDES permit.

In accordance with the NPDES Permit, any discharges from a precipitation event exceeding the 10-year, 24-hour event shall not be subject to the discharge limitations, and calculation of the monthly total will not include discharges during storm events greater than the 10-year, 24-hour precipitation.

SGI therefore requests the NPDES permit be corrected to reflect an average daily pumped discharge rate of 5,900,000 gallons per day (5.9-MGD) from the O.D. facilities at the Charmian operation. Revision of this discharge rate does not adversely affect the performance of the Lower Mill three pond system provided the proposed modifications are completed, and meets all requirements of Chapter102.

Hamiltonban Township, Adams County, PA. Stormwater Management Ordinance

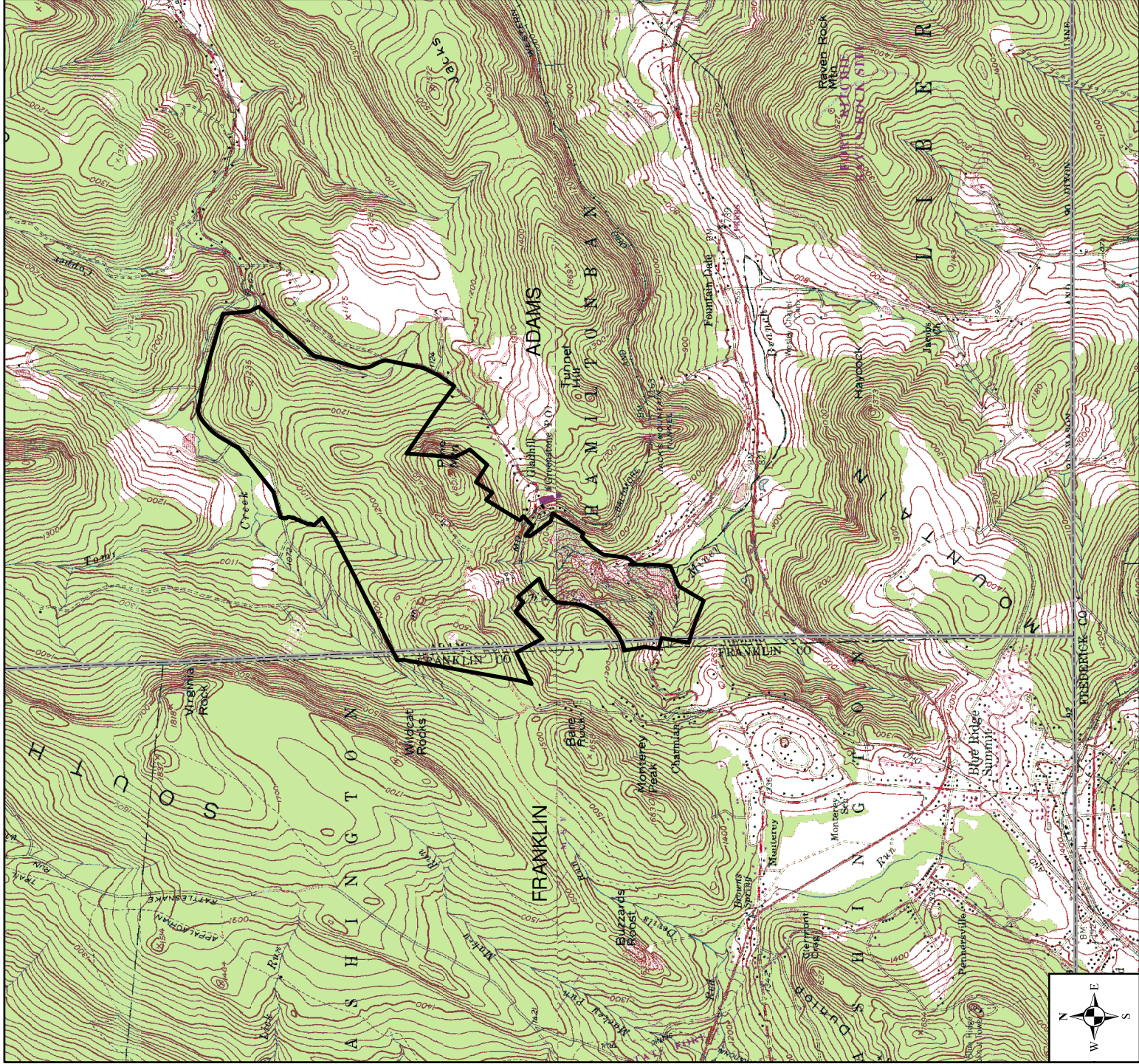
Pennsylvania Department of Transportation, PennDOT Drainage Manual, Publication 584, 2010 Edition.

Urban Hydrology for Small Watersheds, Technical Release 55

HydroCAD Software


Dames and Moore- Appendix D Hydrologic and Hydraulic Analyses (1981)

Figures



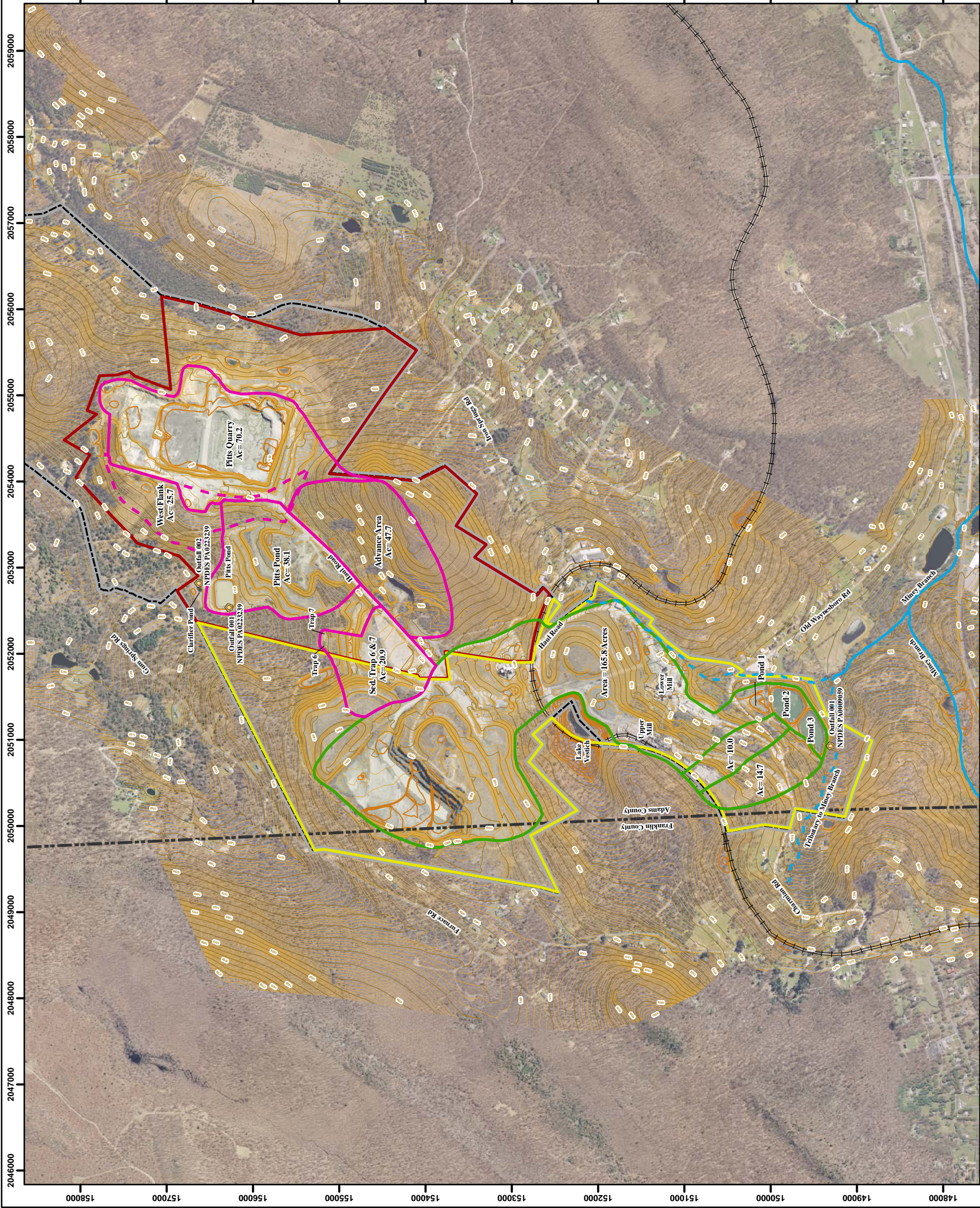
TITLE		PROJECT LOCATION MAP	
PROJECT		SPECIALTY GRANULES INC. BLUE RIDGE SUMMIT, PA ADAMS COUNTY, PENNSYLVANIA	
SCALE		4507 NORTH FRONT STREET, SUITE 200 HARRISBURG, PENNSYLVANIA 17110 TEL (717) 635-7901 FAX (717) 635-7902 www.urscorp.com	
DATE		JOB NO. 20498083	
SCALE 1" = 3000'		DWN. BY BAS	
DATE 10/24/12		APPR. BY MDP	
		FIG NO. 1	

0 3,000 6,000 9,000 Feet

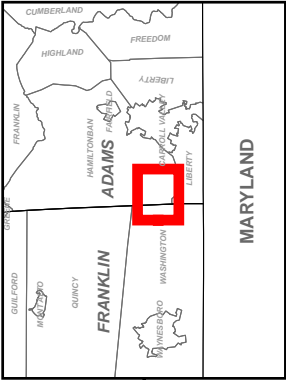


Existing SGI Property

REFERENCE:
BASEMAP OF USGS 7.5 MINUTE TOPOGRAPHIC MAPS; BLUE RIDGE SUMMIT QUADRANGLE; PENNSYLVANIA-MARYLAND 1953, PHOTOREVISED 1985; AND IRON SPRINGS QUADRANGLE; PENNSYLVANIA 1953, PHOTOREVISED 1968 AND 1973, PHOTOINSPECTED 1984
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL



- Legend**
- SGI Property Line
 - Drainage Area to Pitts Pond and Pitts Quarry
 - Lower Mill Pond Natural Drainage Area
 - Existing SMP Boundary (1930302); NPDES Permit No. PA0223239
 - Existing SMP Boundary (6477SM5); NPDES Permit No. PA009059
 - Franklin/Adams County Line
 - Tributary to Miney Branch
 - Miney Branch
 - West Flank Proposed Expansion

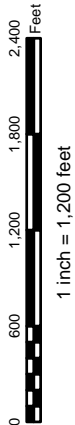


Key Map
Not to Scale

NAD 1983 StatePlane, Pennsylvania, South, FIPS_3702_Feet
Projection: Lambert Conformal Conic
False_Easting: 1988500.000000
False_Northing: 0.000000
Central_Meridian: -77.750000
Standard_Parallel_1: 39.933333
Standard_Parallel_2: 40.966667
Latitude_Of_Origin: 39.333333
Linear Unit: Foot_US
GCS: North American, 1983
Datum: D_North_American_1983

REFERENCE:

PAMAP PROGRAM CYCLE 2 HIGH-RESOLUTION ORTHOMAPAGE 2007 - 2008, PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY

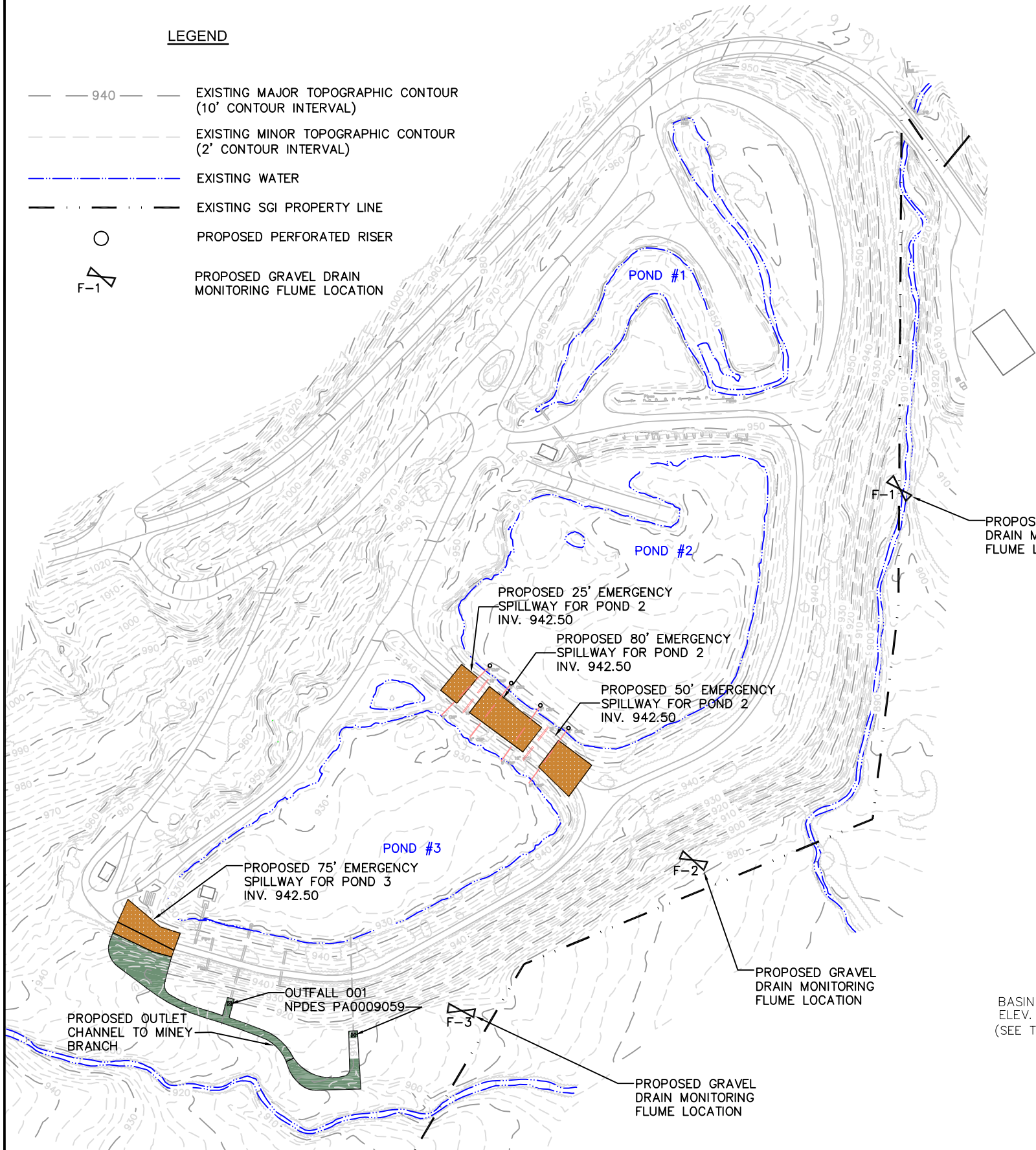


NPDES PERMIT NO. PA009059 APPLICATION ADDENDUM REPORT			
LOWER MILL PONDS DRAINAGE AREAS NPDES PERMIT STUDY			
FIGURE 2 SPECIALTY GRANULES INC. BLUE RIDGE SUMMIT, PA ADAMS COUNTY, PENNSYLVANIA			
Prepared By:	BAS	Checked By:	MDP
Job:	20498083	Date:	11/09/11

File: X:\Projects\Acad\ISP\Project Drawings\Lower Ponds\Proposed Spillways\PropPondImp.dwg Layout: 11X17 User: Jeffrey_Keeney Oct 15, 2012 - 4:18pm

LEGEND

- 940 — EXISTING MAJOR TOPOGRAPHIC CONTOUR (10' CONTOUR INTERVAL)
- - - - - EXISTING MINOR TOPOGRAPHIC CONTOUR (2' CONTOUR INTERVAL)
- — — — — EXISTING WATER
- · - · - · - EXISTING SGI PROPERTY LINE
- PROPOSED PERFORATED RISER
- △ F-1 PROPOSED GRAVEL DRAIN MONITORING FLUME LOCATION



POND 2 & 3
EMERGENCY SPILLWAY

N.T.S.

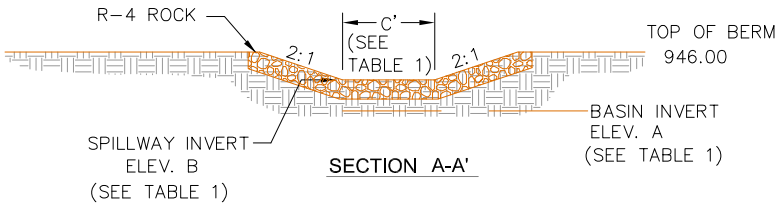
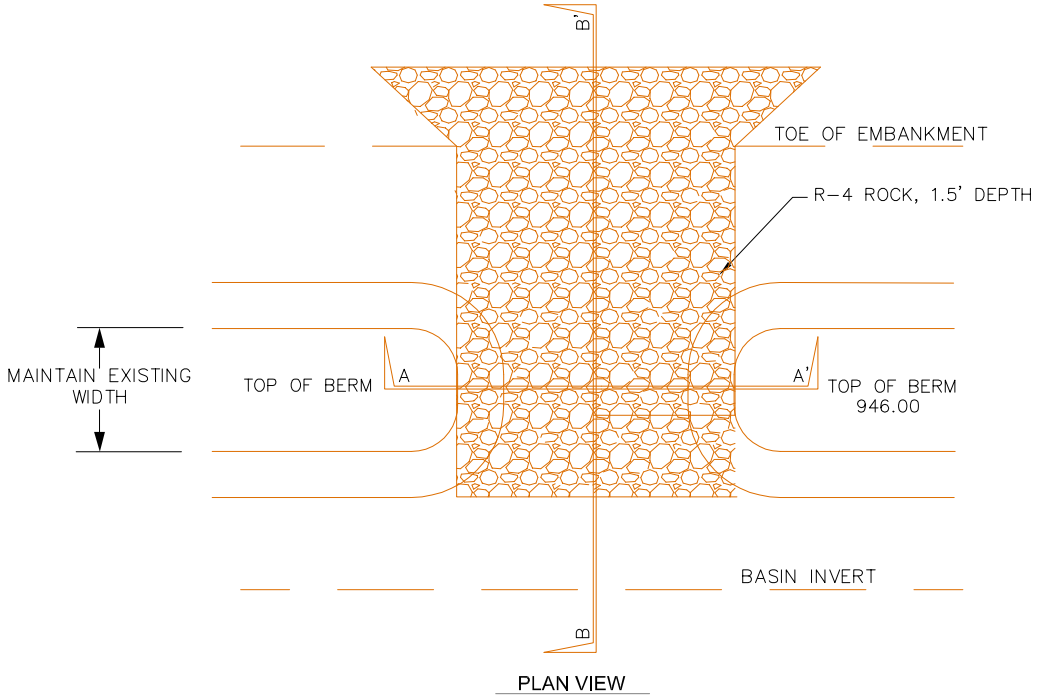
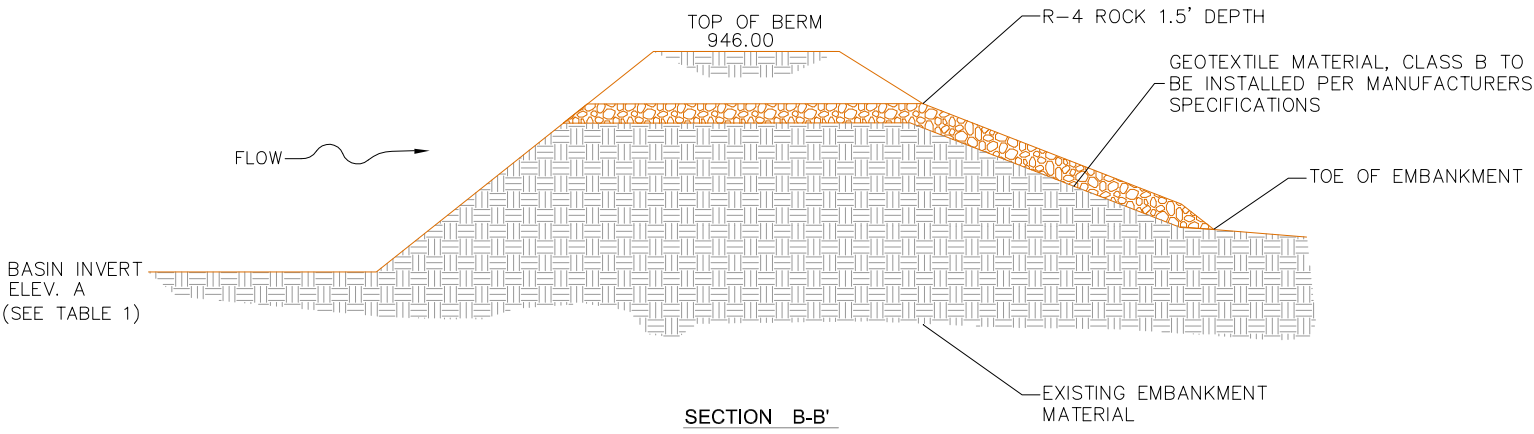


TABLE 1

POND	ELEV. A	ELEV. B	WIDTH C
2	913.00	942.50	25', 80', 50'
3	911.00	942.50	75'



4507 NORTH FRONT STREET, SUITE 200
HARRISBURG, PENNSYLVANIA 17110
(717) 635-7901 FAX (717) 635-7902
www.urscorp.com

SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA

PROPOSED POND IMPROVEMENTS

JOB NO.: 20498083	SCALE: 1"=150'
SHEET:	DATE: 9/24/12
FIGURE 3	REV.:

File: X:\Projects\Acad\ISP\Project Drawings\Lower Ponds\Proposed Spillways\ProPondImp.dwg Layout: 11X17 Section User: Jeffrey_Keeney Oct 15, 2012 - 4:17pm

TABLE 1. POND 2- PADEP CHAPTER 102 REQUIREMENTS

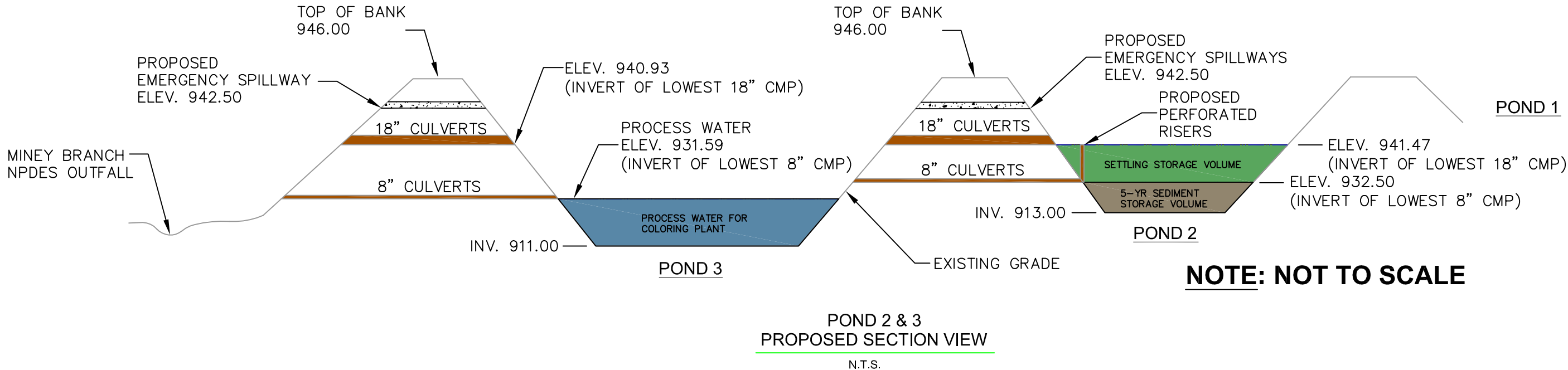
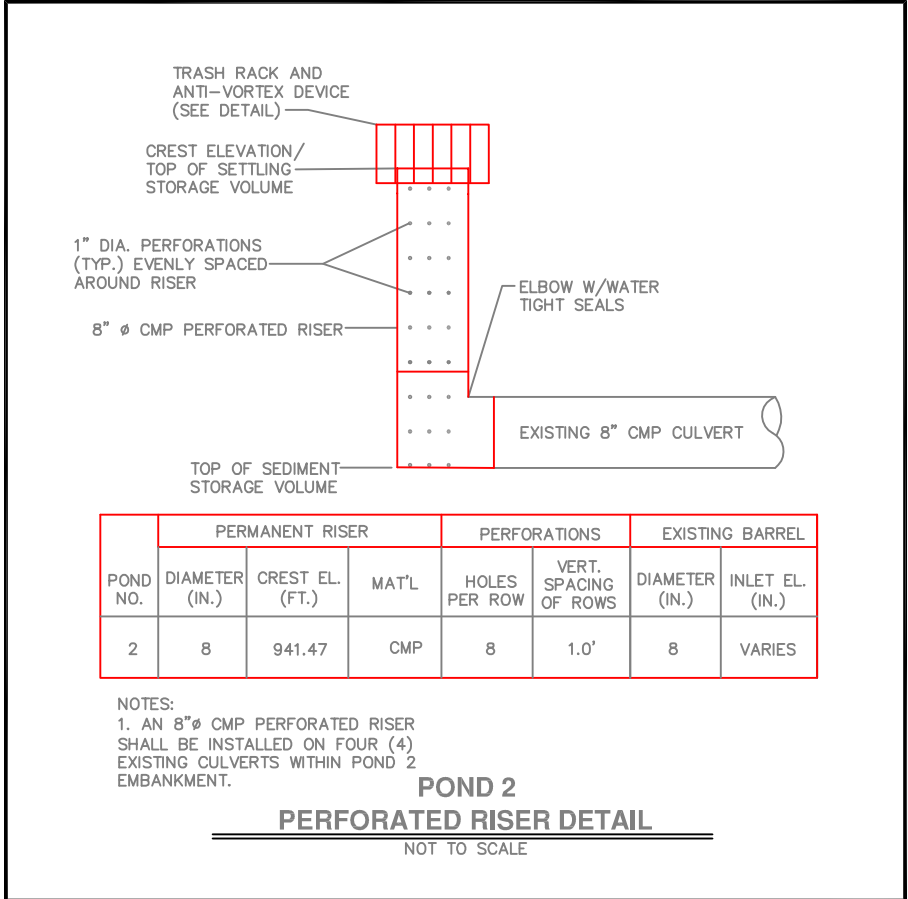
	REQUIRED	PROVIDED	@ ELEVATION
5-YEAR SEDIMENT STORAGE VOLUME (CUBIC FEET)	977,500	1,000,000	932.50
SETTLING VOLUME (CUBIC FEET)	977,500	985,175	941.47-932.50
(GALLONS)	7,311,700	7,369,109	
TOTAL STORAGE VOLUME (SETTLING & SEDIMENT) (CUBIC FEET)	1,955,000	1,985,175	941.47
(GALLONS)	14,623,400	14,849,109	
DISCHARGE CAPACITY (CFS)	391.00	775.73	944.00
DEWATER TIME (DAYS)	2 TO 7	4.3	N/A

TABLE 2. PEAK WATER SURFACE ELEVATIONS

POND	PEAK 2-YR W.S.E. (FT)	PEAK 2-YR OUTFLOW (CFS)	PEAK 10-YR W.S.E. (FT)	PEAK 10-YR OUTFLOW (CFS)	PEAK 25-YR W.S.E. (FT)	PEAK 25-YR OUTFLOW (CFS)	PEAK 100-YR W.S.E. (FT)	PEAK 100-YR OUTFLOW (CFS)
2	942.63	33.09	943.77	612.18	943.92	715.25	944.37	1,070.21
3	941.12	8.16	942.62	29.94	942.70	40.27	943.38	188.29

NOTES:

- 24" FREEBOARD REQUIRED FOR A 10-YR PEAK STORM EVENT.
- 12" FREEBOARD REQUIRED FOR A 100-YR PEAK STORM EVENT.
- TOP OF BANK FOR PONDS 2 & 3 IS 946.00



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SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA

POND 2 AND 3 PROPOSED SECTION VIEW

JOB NO.: 20498083	SCALE: N.T.S.
SHEET:	DATE: 9/24/12
FIGURE 4	REV.:

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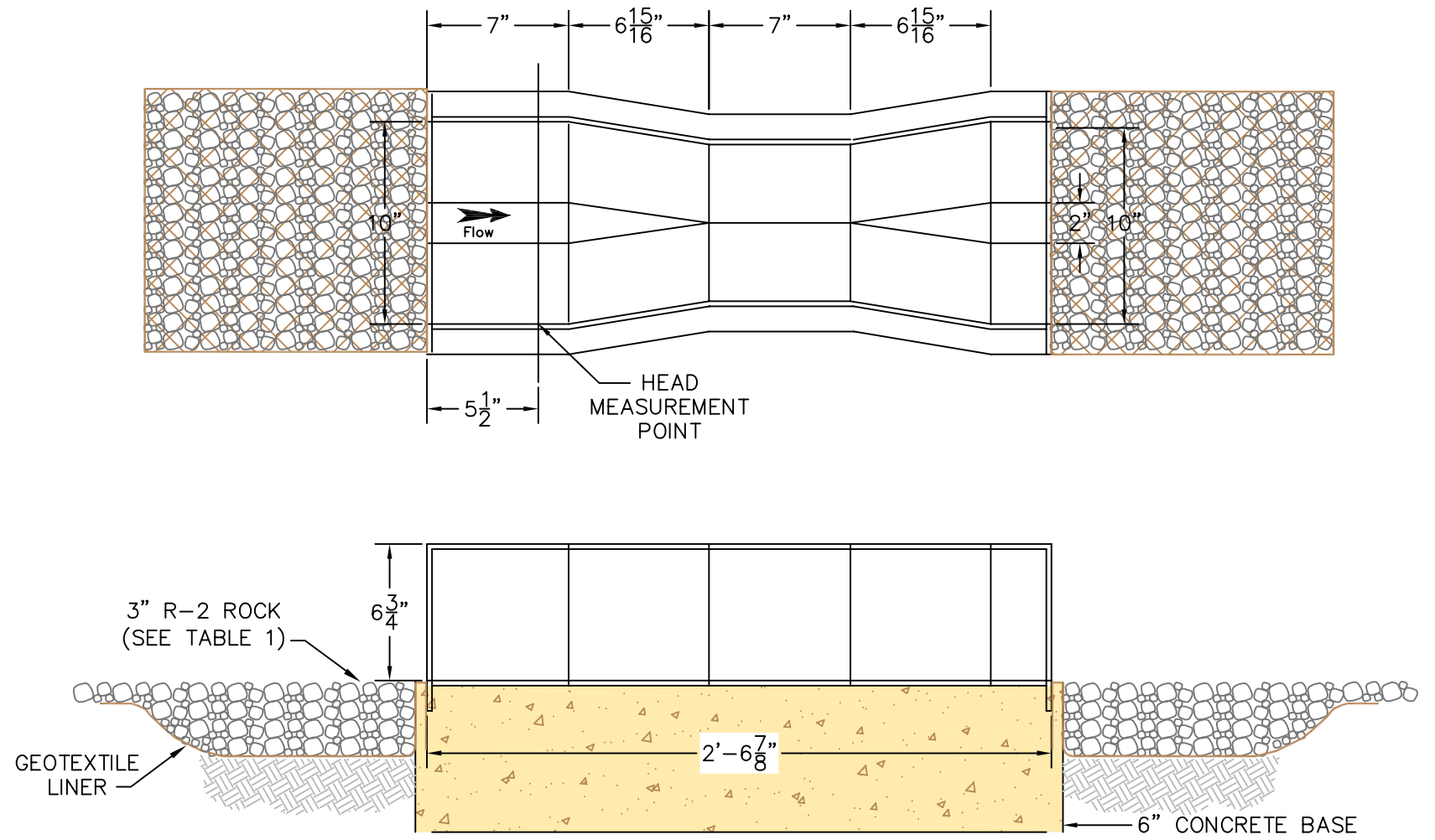
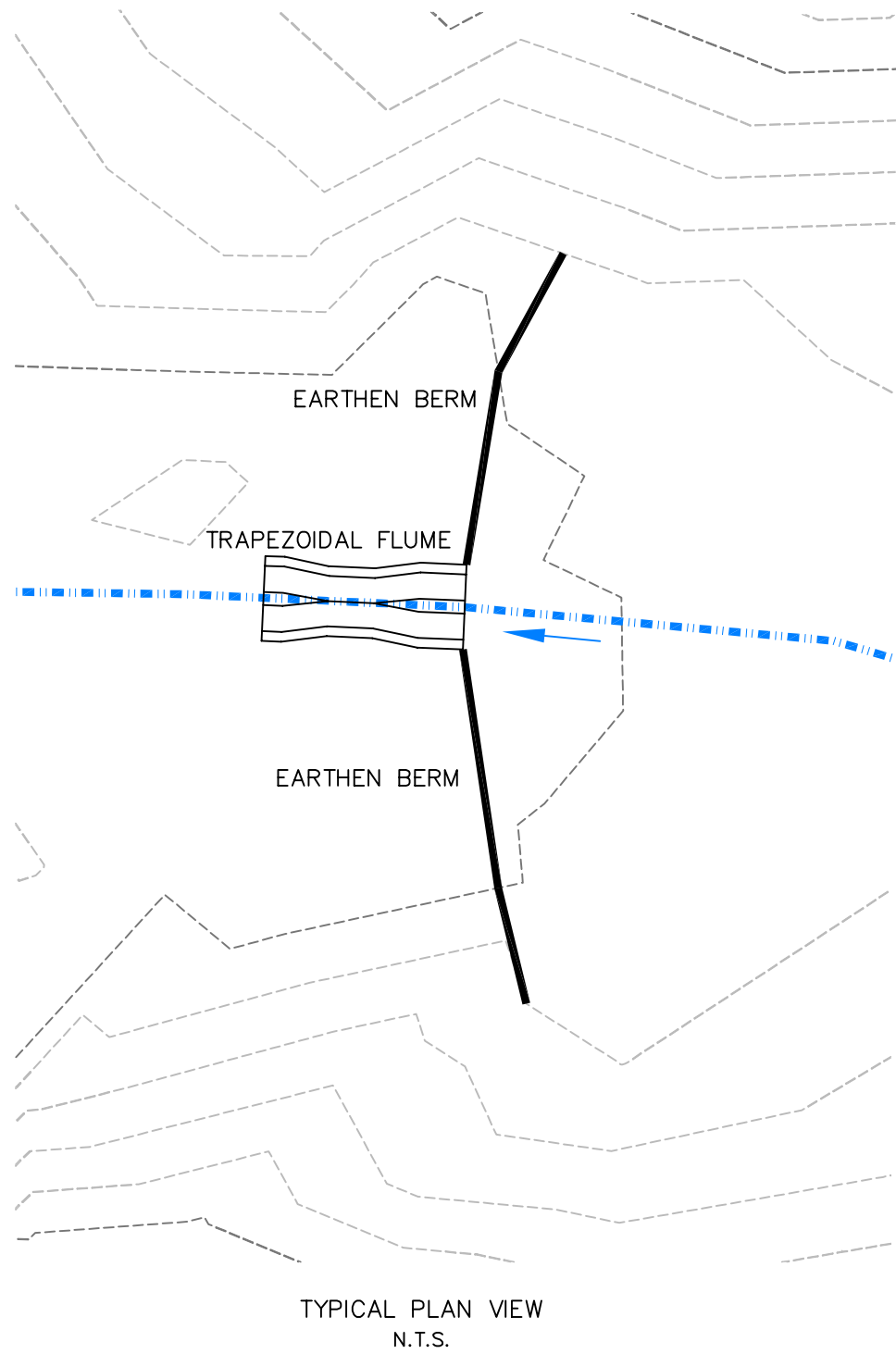
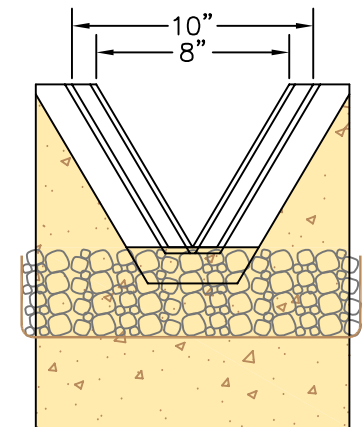


TABLE 1

GRADED ROCK SIZE (INCHES)			
ROCK SIZE	MAXIMUM	D50	MINIMUM
R-2	3	1.5	1

NOTES:
STAFF GAUGE GRADUATED TO 0.01-FOOT TO
BE INSTALLED AT FLUME TO MONITOR FLOW



TYPICAL TRAPEZOIDAL FLUME DETAIL
N.T.S.

REVISIONS				
NO.	BY	CHKD	DATE	DESCRIPTION
1				
2				
3				
4				

**DRAFT**

(Signature)

(Date)

PA. P.E. Certification No.

DESIGNED BY:		DATE
DRAWN BY:	BAS	9/19/12
CHECKED BY:	JAK	9/19/12
APPROVED BY:	BAS	9/19/12
CLIENT APPROVED BY:	MDP	9/19/12
FILE:		




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HARRISBURG, PENNSYLVANIA 17110
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SPECIALTY GRANULES INC.
BLUE RIDGE SUMMIT, PA

TYPICAL DETAILS FOR MONITORING FLUMES F-1 THROUGH F-3

JOB NO.: 20498083	SCALE: N.T.S.
SHEET: 9/24/12	REV.:
DRAWING NO.:	FIGURE 5

Appendix A

NPDES Permit No. PA0009059 and PADEP Comment Letters



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CAMBRIA DISTRICT MINING OFFICE

September 8, 2011

I.S.P. Minerals, Inc.
P. O. Box O
Blue Ridge Summit, PA 17214

Re: NPDES Permit Renewal
"Charmian Plant"
Permit No. 6477SM5
Hamiltonban & Washington Townships, Adams & Franklin Counties

Ladies and Gentlemen:

In conjunction with the Department's review of the NPDES Permit Renewal Application for the above-referenced surface mining permit the following comment is provided:

1. In evaluating the monitoring data it appears that at certain times of the year the discharge rate for the permitted outfall (001), designated DP0001 under the Department's sample information system, is exceeding the maximum discharge rate under the permit. The operator must submit a request to revise the current permit to account for these higher discharge rates. In support of this request, the operator must provide a thorough evaluation of the design for the current system in order to establish that it is capable of handling these higher discharge rates while at the same time consistently maintaining water quality that is compliant with the permitted effluent limits. This evaluation must include an evaluation of the all related aspects and impacts relative to water pumped to this system from the adjacent SMP No. 01930302.

If you have any questions, please contact me at the above number.

Sincerely,

Tim Kania, P.G., Chief
Technical Services Section

cc: Daniel Sammarco, P.E., Acting District Mining Manager
John Wilk, Mine Inspector Supervisor
Jack Thornton, Mine Conservation Inspector
Mike Timcik, P.G., Hydrogeologist
File (6477SM5)
2011 NPDES Renewal (6477SM5)

'bk

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

DEP USE ONLY

Date Received

NPDES PERMIT RENEWAL APPLICATION FOR NONCOAL MINING

Before completing this form, read the step-by-step instructions provided with this Permit Application Package.

SECTION A. APPLICANT INFORMATION			
Applicant Name ISP MINERALS INC.		Applicant Type <input type="checkbox"/> Individual (INDIV) <input type="checkbox"/> PA Corporation (PACOR) <input checked="" type="checkbox"/> Non-PA Corporation (NPACO) <input type="checkbox"/> General Partnership (PARTG) <input type="checkbox"/> Limited Partnership (PARTL) <input type="checkbox"/> Municipality (MUNI) <input type="checkbox"/> Sole Proprietorship (SOLEP) <input type="checkbox"/> Other (OTHER)	
Mailing Address P.O. BOX 0 (Street # and Name or P.O. Box)			
Blue Ridge Summit	PA	17214	(Zip Code + Four)
7177942184	Ext.	7177945248	(FAX #)
(Telephone #)		Mining Operator's License # 6982	
Applicant Contact Crumbaker (Last Name)			
Sr. Plant Engineer		Douglas	(First Name)
Mailing Address P.O. BOX 0		(Title)	
Blue Ridge Summit		PA	17214
(City)		(State)	(Zip Code + Four)
Dcrumbaker@ISPCORP.com		(717) 7943310	Ext.
(Email Address)		(Telephone #)	(FAX #)
SECTION B. DESCRIPTION OF ACTIVITY			
Type of Mining Activity(ies) <input checked="" type="checkbox"/> Surface Mining <input type="checkbox"/> Underground Mining (Includes Surface Effects of Underground Mining) <input type="checkbox"/> Incidental Coal Extraction <input type="checkbox"/> Other (specify) _____			
SECTION C. SITE INFORMATION			
Operation/Site Name Charmian Plant			
Operation/Site Location			
Adams	County(ies)	Hamiltonban	Municipality(ies)
Franklin		Washington	
NPDES Permit No. PA0009059 Permit Issuance Date 11/6/1981 Permit Expiration Date 11/6/2011			
Mining Permit No. or Mine Drainage Permit No. 6477SM5T2			

SECTION D. CONSULTANT			
N/A			
(Last Name)		(First Name)	(MI)
(Title)		(Name of Consulting Firm)	
Mailing Address			
(Street # and Name or P.O. Box)			
(City)	(State)	(Zip Code + Four)	
(E-mail Address)	(Telephone #)	(Fax #)	

SECTION E. NPDES INFORMATION

Identify each point of discharge, the receiving stream and the corresponding latitude and longitude. The labeling of discharge points must correspond with the labels used on the mining permit maps.

[illegible]

Describe Treatment or Other Control Technology A series of

three sedimentation ponds are in use to control direct run off
and precipitation collected within the quarry and pond #6.

This discharge occasionally includes water pumped from

adjacent SMP01930302, also permitted and operated by ISP

Minerals Inc.

The information on the NPDES form must be certified correct by one of the following, as applicable.

- a) In the case of corporations, by principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
- b) In the case of a partnership, by a general partner.
- c) In the case of a sole proprietorship, by the proprietor.
- d) In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

I certify that I am familiar with the information contained in the above table, and that to the best of my knowledge and belief such information is true, complete, and accurate.

William Hudak

Printed Name of Person Signing

Site manager

Title

Date _____

Signature

18 U.S.C Section 1001 provides that:

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes or uses any false, fictitious, or fraudulent statements or representations; or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both.

Application Date:

SECTION F. AFFIDAVIT

Commonwealth of Pennsylvania, County of Adams

I, William Hudak

being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (cross out inapplicable portions in parenthesis)

Sworn and Subscribed to Before Me This

Day of

(month)

(year)

Signature of Applicant or Responsible Official

Notary Public

Name (Typed)

Title and Seal

Address

NPDES PERMIT RENEWAL
SUPPLEMENTAL INFORMATION

Permittee: ISP Minerals Inc. NCSMP # 6477SM5
Address: P.O. Box 0 NPDES #PA 0009059
1455 Old Waynesboro Road Municipality(s): Hamiltonban, Washington
Blue Ridge Summit, PA, County(s) Adams and Franklin
17214
Operation Name: Charmian Plant Phone # 717-794-2184

I. Current PA Code, Title 25, Chapter 93 Stream Classification for each watercourse receiving a direct, point-source discharge (listed in the above NPDES Permit) from this site:

<u>Outfall No.</u>	<u>Stream Name</u>	<u>Stream Zone</u>	<u>Classification</u>
001	4-Miney Branch to Toms Creek	Basins	CWF

II. List all current public (community and non-community) surface water supplies that have intakes on the receiving stream within 10 miles (16 km) downstream of each outfall.

<u>Facility Name/Address</u>	<u>Approximate Distance Downstream</u>
None	

I hereby attest that I (am applicant)(am officer or official of the applicant)(have the authority to make this application) and that the report and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

MP29A-NPDES

PART A

NONCOAL SURFACE MINING PERMIT NO. 6477SM5T2NPDES PERMIT NO. PA0009059

PERMITTEE NAME ISP Minerals, Inc. ISSUANCE DATE November 6, 1981
 AND ADDRESS PO Box O RENEWAL DATES 8/2/96; 7/31/01 & 5/4/06
Blue Ridge Summit, PA 17214 REISSUANCE DATES 4/26/94; 4/30/97 & 12/23/97
 TRANSFER DATES 4/26/94 & 9/27/04
 EXPIRATION DATE November 6, 2011
 NAME OF OPERATION ISP Charmain Quarry
 LOCATION OF OPERATION:
 MUNICIPALITIES Hamiltonban & Washington Townships COUNTIES Adams & Franklin

TYPE OF OPERATION

- ☒ Noncoal Surface Mine
☐ Surface Activity Connected With Underground Mining (Noncoal)
☐ Other _____

DISCHARGE TO (RECEIVING WATERS) Miney Branch to Tom's Creek

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

- A. TYPE OF DISCHARGE FACILITY
 (M.D.T.) Mine Drainage Treatment Facilities
 (E&S) Erosion and Sediment Control Facilities
 (O.D.) Other discharge facilities

Outfall Numbers	Type of Discharge Facility (Key to a.)	Latitude	Longitude
001	E&S*/O.D.**	39° 44' 30"	77° 27' 30"
		° ' "	° ' "
		° ' "	° ' "
		° ' "	° ' "

*Includes direct runoff and precipitation collected within the quarry and Pond 6.

** Water discharged at this point occasionally includes water pumped from adjacent SMP #01930302 also permitted and operated by ISP Minerals, Inc. O.D. limits shall apply during periods when water is pumped into the ponds associated with Outfall 001.

- B. The permittee is authorized to discharge during the period from November 6, 1981 through November 6, 2011.

- C. Based on the hydrologic data and anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or revisions, the following effluent limitations and monitoring requirements apply to the above listed outfall numbers.

NPDES PERMIT RENEWAL

Type of Discharge Facility	<u>DISCHARGE LIMITATIONS*</u>				<u>MONITORING REQUIREMENTS</u>	
	Discharge Parameter	Average Monthly	Maximum Daily	Instantaneous Maximum	Measurement Frequency	Sample Type

E & S	Total Suspended Solids	35.0	70.0	90.0	Monthly	Grab
-------	------------------------------	------	------	------	---------	------

(or Total Settleable Solids as in Part A.1.D.1 below)

M.D.T. or O.D.	Total Suspended Solids	35.0	70.0	90.0	Monthly	Grab
----------------	------------------------------	------	------	------	---------	------

Average Discharge Rate	0.10 MGD	---	---	Daily	Measured Flow
------------------------------	----------	-----	-----	-------	---------------

Note: The discharge limitations designated above for M.D.T. or O.D. facilities shall apply to all NPDES Point-Source discharges of groundwater or other discharges that are subject to mechanical control (i.e. pumping) at any point prior to the discharge.

pH not less than 8.0 standard units nor greater than 9.0 standard units at all times.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Unless otherwise indicated, discharge limitations are concentrations expressed in mg/l, and the total (dissolved plus suspended fraction) is applicable for each parameter.

Samples taken in compliance with the monitoring requirements specified above shall be taken during a discharge at the following location(s):

At the outlet of all major erosion and sediment pollution control facilities, whether NPDES point-source discharges as listed above or non-point-source discharges and all other NPDES point-source discharges (if any).

D. Any discharge of water, whether listed under Part A, Section 1.a. or not, from areas within this surface mining permit disturbed by surface mining and reclamation operations must meet the Discharge Limitations listed in Part A, Section 1.c. except as described below.

- Discharges of surface runoff (not subject to mechanical control), from major erosion and sediment pollution controls (i.e. sediment basins), that are a result of a precipitation event and occur within 24 hours of said precipitation event shall not be subject to the total suspended solids limitations listed in Part A, Section 1.c. above. Discharges described by this condition shall meet a maximum total settleable solids limit of 0.5 ml/l.
- Other discharges of surface runoff from minor erosion and sediment pollution controls (sheet flow from minor areas, outcrops, berms, etc.) shall meet the Department's standards for temporary control of sediment and timely stabilization of disturbed areas (Best Management Practices).
- Any discharges resulting from a precipitation event exceeding the expected 10-year, 24-hour precipitation shall not be subject to the limitations of Part A, Section 1.c.

cc: Fish & Boat Commission
SMCI File
File

PA0008058

By Roger Homberger
Title District Mining Manager

NPDES PERMIT RENEWAL
SUPPLEMENTAL INFORMATION

Permittee: ISP Minerals, Inc. NOSMP # 6477SM5
Address: P.O. Box 0 NPDES #PA 0009059
1455 Old Waynesboro Road Municipality(s): Hamiltonban, Washington
Blue Ridge Summit, PA. County(s): Adams and Franklin
17214
Operation Name: Charmian Plant Phone # 717-794-2184

I. Current PA Code, Title 25, Chapter 93 Stream Classification for each watercourse receiving a direct, point-source discharge (listed in the above NPDES Permit) from this site:

<u>Outfall No.</u>	<u>Stream Name</u>	<u>Stream Zone</u>	<u>Classification</u>
001	4-Miney Branch to Toms Creek	Basins	CWF

II. List all current public (community and non-community) surface water supplies that have intakes on the receiving stream within 10 miles (16 km) downstream of each outfall.

Facility Name/Address
None
Approximate Distance Downstream

I hereby attest that I (am applicant) (am officer or official of the applicant) (have the authority to make this application) and that the report and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

MP29A-NPDES

Michael E. Hunt
Signature



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

DEP USE ONLY

Date Received

04/27/05

NPDES PERMIT RENEWAL APPLICATION FOR NONCOAL MINING

Before completing this form, read the step-by-step instructions provided with this Permit Application Package.

SECTION A. APPLICANT INFORMATION			
Applicant Name ISP MINERALS INC		Applicant Type <input type="checkbox"/> Individual (INDIV) <input type="checkbox"/> PA Corporation (PACOR) <input checked="" type="checkbox"/> Non-PA Corporation (NPACO) <input type="checkbox"/> General Partnership (PARTG) <input type="checkbox"/> Limited Partnership (PARTL) <input type="checkbox"/> Municipality (MUNI) <input type="checkbox"/> Sole Proprietorship (SOLEP) <input type="checkbox"/> Other (OTHER)	
Mailing Address P.O. Box O (Street # and Name or P.O. Box)			
Blue Ridge Summit	PA	17214	(Zip Code + Four)
717942184	Ext.	7177945248	(FAX #)
Mining Operator's License # 6982			
Applicant Contact Crumbacker (Last Name)		Douglas (First Name)	
Plant Engineer		R. (MI)	
Mailing Address P.O. Box O (Street # and Name or P.O. Box)			
Blue Ridge Summit	PA	17268	(Zip Code + Four)
Dcrumbacker@ISPCORP.com	(717) 7942184	Ext. 210	7177943338
(Email Address)		(Telephone #)	(FAX #)
SECTION B. DESCRIPTION OF ACTIVITY			
Type of Mining Activity(ies) <input checked="" type="checkbox"/> Surface Mining <input type="checkbox"/> Underground Mining (includes Surface Effects of Underground Mining) <input type="checkbox"/> Incidental Coal Extraction <input type="checkbox"/> Other (specify) _____			
SECTION C. SITE INFORMATION			
Operation/Site Name Charmian Plant			
Operation/Site Location County(ies) Adams Franklin Municipality(ies) Hamiltonban Washington			
NPDES Permit No. 230009558 Permit Issuance Date 11/6/1981 Permit Expiration Date 11/6/2006			
Mining Permit No. or Mine Drainage Permit No. 6477SM512			

SECTION D. CONSULTANT

 (Last Name)

 (Title)

 Mailing Address

 (City)

 (E-mail Address)

 (First Name)

 (Name of Consulting Firm)

 (MI)

 (Street # and Name or P.O. Box)

 (State)

 (Zip Code + Four)

 (Telephone #)

 (Fax #)

Identify each point of discharge, the receiving stream and the corresponding latitude and longitude. The labeling of discharge points must correspond with the labels used on the mining permit maps.

[illegible]

sedimentation ponds are in use to control direct run off and precipitation collected within the quarry and pond 6.

adjacent SMP01930302, also permitted and operated by ISP

The information on the NPDES form must be certified correct by one of the following, as applicable.

- I certify that I am familiar with the information contained in the above table, and that to the best of my knowledge and belief such information is true, complete, and accurate.

Date _____

Whoever, in any matter within the jurisdiction of any department or agency of the United States, knowingly, and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes or uses any false, fictitious, or fraudulent statements or representations; or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both.

Application Date:

SECTION F. AFFIDAVIT

Commonwealth of Pennsylvania, County of Adams

I, Michael E. Shelbert

being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (cross out inapplicable portions in parenthesis).

Sworn and Subscribed to Before Me This

21st Day of March 2006
(Month) (Year)

Michael E. Shelbert
Signature of Applicant or Responsible Official

Judith A. Hay
Notary Public
Notary Public
Title and Seal

Michael E. Shelbert

Name (Typed)

1455 Old Waynesboro Road, Blue Ridge Summit, PA. 17214

Address



COMMONWEALTH OF PA

Notarial Seal
Judith A. Hay, Notary Public
Fairfield Borough, Adams County
My Commission Expires June 12, 2008



2006 MAR 21



Pennsylvania Department of Environmental Protection

5 West Laurel Boulevard
Pottsville, PA 17801-2454
May 4, 2006

570-621-3118
FAX #570-621-3110

Pottsville District Office

NOTICE OF PERMIT CORRECTION

ISP Minerals, Inc.
P.O. Box O
Blue Ridge Summit, PA 17214

Re: Application No. 6477SM5C2
Charmain Plant Operation
Hamiltonban and Washington Townships
Adams and Franklin Counties

Ladies & Gentlemen:

Existing permit #6477SM5T2 is hereby corrected per the above-referenced application dated March 14, 2006. The purpose of this correction is to renew NPDES Permit No. PA0009059.

The enclosed information shall be considered an addendum to the original permit issued on November 6, 1981 and any subsequent revisions or corrections. This information is to be filed with your copy of the original permit and, in case of any conflicts with the original permit, shall take precedence over the original permit information.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 PA C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, PO Box 8457, Harrisburg, PA 17105-8457, (717) 787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, (800) 654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at (717) 787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law. If you want to challenge this action, your appeal must reach the Board within 30 days. You do not need a lawyer to file an appeal with the Board. Important legal rights are at stake, however, so you should show this document to a lawyer at once. If you cannot afford a lawyer, you may qualify for free pro bono representation. Call the secretary to the Board (717) 787-3483 for more information.

Should you have any questions, please contact Keith A. Laslow, P.G., Pottsville District Office.

Enclosures

cc: Keith A. Laslow
SMCIS, Thomas N. Flannery
SMCI File
PA Fish & Boat Commission
Municipalities of Hamiltonban & Washington Twrps.
Counties of Adams and Franklin
File
MS1-IsP (3/08)

RJH:JSB:gk

cc: SHEAER
KUHNEWALL

Sincerely,


Roger J. Hornberger
District Mining Manager
District Mining Operations





pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CAMBRIA DISTRICT MINING OFFICE

April 25, 2012

Specialty Granules, Inc.
1455 Old Waynesboro Road
Blue Ridge Summit, PA 17214

Re: NPDES Permit Renewal
"Charmian Plant"
SMP No. 6477SM5
Hamiltonban & Washington Townships
Adams & Franklin Counties

Ladies and Gentlemen:

The Department has completed its review of the package of revisions submitted as part of the NPDES Permit Renewal Application for the above referenced surface mining permit. This package was submitted under cover letter dated January 5 and received at the Cambria Office on January 6. The following comments are provided:

Section 1 – Introduction

- 1.) On page 1, please clarify the drainage area for the Pitts Quarry. The 70.2 acres noted on Figure 2, Lower Mill Ponds Drainage Areas NPDES Permit Study, is smaller than the drainage area outlined on the Figure 2 Map.

Section 2 – Project Description

- 1.) Please clarify the number of discharges for the Lower Mill system. Presently the Dames & Moore July 31, 1980 Report noted two 8-inch steel pipes installed at elevation 930.0 as operating outlets from Settling Basin No. 3. These outlet pipes will be at least 100 feet apart in order to distribute the flow across Basin No. 3 and prevent channeling. The two 8-inch steel pipes will have sufficient capacity to accumulate the 10 year, 24-hour storm flow. The 25-year, 24-hour storm will be discharged into Miney Branch through two 18-inch diameter corrugated metal pipes installed at elevation 940.0 near the northwest end of the perimeter embankment of Basin No. 3. Finally, there is a gravel drainage blanket constructed in the Basin No. 3 embankment and Dames & Moore noted a seepage measurement weir would be constructed to monitor the flow. However, this weir was not constructed. All discharges from the Settling Basin No. 3 need to be measured to find the total discharge from the Lower Mill system.

Section 3 – Computations

- 1.) As part of Section 3.4 (Lower Mill Pond System Capacity), please clarify how much drainage area is going to each sediment pond. Chapter 105 notes if a pond drainage area is over 100 acres then a dam permit is required. In addition, please provide the maximum storage value in acre-feet for each pond.

Appendix C – Stormwater Runoff and Capacity Calculations

- 1.) Please revise Standard Worksheet #12, Sediment Basin Capacity Requirements for ponds 2 & 3 as follows:
 - a.) The required sediment storage volume is not correct as shown on the worksheet. The correct sediment storage volume is 1,000 cubic feet per acre times 392.9 acres equals 392,900 cubic feet.
 - b.) The total required storage volume needs to be corrected since the sediment storage volume is not correct.
 - c.) Please provide as built drawings and pond certifications for ponds #2 and #3 since there is some discrepancy from the Dames & Moore, July 1980 Report on Sedimentation Studies for the Charmian Plant. The Dames & Moore study noted the total capacity of ponds #2 and #3 to be 2,280,000 cubic feet and now the total pond volume for ponds #2 and #3 is 3,291,484 cubic feet.
- 2.) Please clarify on the Standard Worksheet #14 for both Sediment Ponds #2 and #3 the following:
 - a.) Please label the storage volume at the inlet to the principal spillway, the emergency spillway and the top of the pond embankment for each pond. The pond depths do not agree with the Dames & Moore Study of the pond depth calculations. Presently Standard Worksheet #14 is showing the total depth of Basin #2 to be 27 feet and the total depth of Basin #3 is 29 feet to the top of the pond at the storage volume of 3.3 million cubic feet. Chapter 105 requires a Dam Safety Permit if the impoundment has the greatest depth of water measured by the upstream toe of the dam at maximum elevation (top of embankment) exceeds 15 feet.

Section 4 – Conclusions

- 1.) Please construct weirs downstream of the Sediment Basin #3 outfalls. The one weir can help in the calibration of the proposed flow meter for Sediment Pond #3. The weir can provide a second check for the flow meter. However, if there is more than one discharge location for Sediment Basin #3 then all the discharges must be measured for the total outfall for Sediment Basin #3.
- 2.) Please clarify how long SGI personnel will have to wait to pump from the Pitts Quarry and Pitts Pond, after the peak flow has occurred at the Lower Mill natural drainage area. The Master Design Storm Summary, page 1.01 notes as the peak hours, 54.9, for the water to exit Pond 3. Is this the time that the SGI personnel will have to wait until they can pump from the other drainage areas?

Please address these comments within 30 days.

If you have any questions, please contact me at the above number.

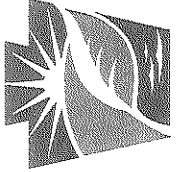
Sincerely,



Michael Timcik, P.G.
Hydrogeologist

cc: Dan Sammarco, P.E., District Mining Manager
Tim Kania, P.G., Chief, Technical Services Section
John Wilk, Mine Inspector Supervisor
Jack Thornton, Mine Conservation Inspector
Mike Timcik, P.G., Hydrogeologist
2011 NPDES Renewal (6477SM5)
File (6477SM5)

'da



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CAMBRIA DISTRICT MINING OFFICE

July 13, 2012

Specialty Granules, Inc.
1455 Old Waynesboro Road
Blue Ridge Summit, PA 17214

Re: NPDES Permit Renewal
"Charmian Plant"
Permit No. 6477SM5
Hamiltonban and Washington Townships, Adams and Franklin Counties

Ladies and Gentlemen:

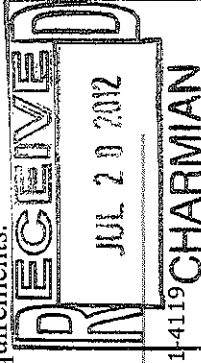
The Department has completed its review of the package of revisions submitted under cover letter dated May 24 relative to the NPDES Permit Renewal Application for the above-referenced surface mining permit. The following comments are provided:

Section 2 – Project Description

1. Please provide the flow rates of the discharges for the Lower Mill system, pond #3. Presently you are showing the 8" CMP discharges. However, with the surface water elevation of 931.8 and the top of the riser pipe to be 931.78 the 8" CMP should have a continuous discharge, but no flow rates were provided.
2. Please provide the flow rates from the seeps.

Section 3 – Computations

1. Please clarify how the Lower Mill Pond System qualifies for a dam permit waiver as provided for a Chapter 105, Section 12 – Waiver of Permit Requirements, under Paragraph 6. Does the Lower Mill Pond System meet all requirements of Chapter 102 as it relates to erosion and sediment control? Does the Lower Mill Pond System have a design emergency spillway that meets the Chapter 102 requirements? Do the ponds have dewatering pipes to lower the pond elevation to the sediment storage level to allow sufficient storage volume? If the ponds are always full at the elevations noted on the **As-Built Plan for Sediment Ponds 2 and 3 – June 2011**, then the ponds do not meet the required storage volume of 5,000 cubic feet per acre. Are the ponds certified by a professional engineer or registered land surveyor? Please provide this information to justify that the Lower Mill Pond System meets all Chapter 102 requirements.



Bureau of District Mining Operations, 286 Industrial Park Road, Ebensburg, PA 15931-4119

814.472.1900 FAX 814.472.1898

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www.dep.state.pa.us

Section 4 – Conclusions

1. Until weirs are constructed downstream of Sediment Basin #3 outfalls and dates and flow rates provided it is hard to determine the average monthly discharge rate required for the NPDES permit.
2. Please clarify how SGI personnel will know what flow rate they will pump to the Lower Mill Pond System. Do you have a flow gauge on the pumps to determine the correct flow rates? Please provide the pump models, horsepower and pumping curves to show the correct flow rates at which these pumps will perform. Please show all pipeline losses and sizes for the flow designs.

Please note that the Department must re-publish in the PA Bulletin to revise the permitted discharge rate. This can only be completed when information is submitted to arrive at an acceptable discharge rate for the permit.

Please respond to these comments within thirty (30) days.

If you have any questions, please contact me at the above number.

Sincerely,



Michael Timcik, P.G.
Hydrogeologist

cc: Daniel Sammarco, P.E., District Mining Manager
Tim Kania, P.G., Chief, Technical Services Section
John Wilk, Mine Inspector Supervisor
Jack Thornton, Mine Conservation Inspector
Mike Timcik, P.G., Hydrogeologist
2011 NPDES Renewal (6477SM5)
File (6477SM5)

*bk



September 26, 2012

Pennsylvania Department of the Environmental Protection
Bureau of District Mining Operations
286 Industrial Park Road
Ebensburg, PA 15931-4119

Attention: Michael Timcik, P.G.
Hydrogeologist

Re: Purpose of Gravel Drainage Blanket in Water Retaining Structures

Dear Mr. Timcik:

It is my understanding that the subject of gravel drainage blankets was discussed during an August 21, 2012 meeting between SGI, URS and PADEP regarding the sediment ponds on the SGI property in Blue Ridge Summit, Pennsylvania. During this conversation, the PADEP mentioned that the gravel drainage blanket is something that they believed was not common with embankments and questioned its purpose. It is believed that this discussion was based upon a figure (Section "C") in the December 1979 Dames & Moore report that shows a gravel drainage blanket below a new barren rock fill.

The text of the 1979 Dames & Moore report indicates that the buttress berm must be designed to allow seepage water to drain safely. Therefore, the bottom of the buttress berm should be constructed of coarse fill, including sand, gravel, and small rock. The fill should include no more than 10 percent particles passing the No. 200 sieve." The cross-section in the Dames & Moore 1980 report indicates the recommended thickness of this layer was to be 3 feet.

The use of internal drainage, such as a blanket drain, is considered good protection in the design and construction of water retaining structures because control of seepage through the dam decreases the amount of water held in the downstream slope, which decreases the driving forces. Keeping the downstream shell unsaturated also increases the strength of the material, which increases the resisting forces. Therefore, overall, use of effective internal drainage will generally increase the stability of the downstream embankment slope. Another purpose of properly designed internal system drainage is to collect seepage and serve as a filter to prevent piping of foundation and embankment soils.

Discussions of the use of drainage blankets can also be found in the engineering manuals prepared by the US Army Corps of Engineer, Bureau of Reclamation, and the NRCS.

URS Corporation
12420 Milestone Center Drive, Suite 150
Germantown, MD 20876
Phone: 301.820.3000
Fax: 301.820.3009
www.urscorp.com

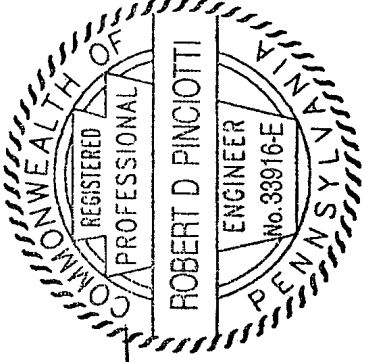
Should you have any further questions regarding the use of gravel drainage blankets in the design and construction of water retaining structures, please do not hesitate to contact me.

Sincerely,

URS Corporation



Robert Pinciotti, PE
Principal Geotechnical Engineer



cc: Tom Nalisnick, PE – PADEP
Tim Kania, PE – PADEP
Ken Walton - SGI
Mark Pennell, PE - URS
Joseph Kula, PE - URS

Appendix B

Manufacturer's Flocculant and Coagulant Product Information



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME :

ULTRION® 8157

APPLICATION :

CLARIFICATION AID

COMPANY IDENTIFICATION :

Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) :

(800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 1 / 2 FLAMMABILITY : 1 / 1 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Aluminum Hydroxychloride	1327-41-9	10.0 - 30.0
Aluminum Phosphate	13530-50-2	1.0 - 5.0
Calcium Chloride	10043-52-4	10.0 - 30.0

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING

Irritating to eyes.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.

Wear suitable protective clothing.

May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of carbon (COx) under fire conditions.

May evolve oxides of phosphorus (POx) under fire conditions. May evolve HCl under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Can cause moderate irritation.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

SKIN CONTACT :

Can cause moderate irritation.

INGESTION :

Not a likely route of exposure. No adverse effects expected.

INHALATION :

Not a likely route of exposure. Aerosols or product mist may irritate the upper respiratory tract.

SYMPTOMS OF EXPOSURE :

Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :

No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :

Immediately flush eye with water for at least 15 minutes while holding eyelids open. If irritation persists, repeat flushing. Get immediate medical attention.

SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. If symptoms persist, call a physician.

INGESTION :

Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :

Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT :

None



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

EXTINGUISHING MEDIA :

This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Keep containers cool by spraying with water. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :

May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of phosphorus (POx) under fire conditions. May evolve HCl under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :

SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :

This product is toxic to fish and other water organisms. Do not discharge directly into lakes, ponds, streams, waterways or public water supplies.

7. HANDLING AND STORAGE

HANDLING :

Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Keep the containers closed when not in use. Use with adequate ventilation.

STORAGE CONDITIONS :

Store the containers tightly closed. Store in suitable labeled containers.

SUITABLE CONSTRUCTION MATERIAL :

Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Country/Source	Substance(s)	Category:	ppm	mg/m3
----------------	--------------	-----------	-----	-------

ENGINEERING MEASURES :

General ventilation is recommended.

RESPIRATORY PROTECTION :

Respiratory protection is not normally needed. If significant mists, vapors or aerosols are generated an approved respirator is recommended. Where concentrations in air may exceed the limits given in this section, the use of a full face filter mask or air supplied breathing apparatus is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Multi-contaminant cartridge, with a Particulate pre-filter. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used.

HAND PROTECTION :

Neoprene gloves Nitrile gloves Butyl gloves PVC gloves

SKIN PROTECTION :

Wear standard protective clothing.

EYE PROTECTION :

Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Keep an eye wash fountain available. Keep a safety shower available.

HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is:
Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Greenish Brown
ODOR	Slight
SPECIFIC GRAVITY	1.27 @ 72 °F / 22 °C
DENSITY	10.6 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	2.7
VISCOSITY	14 cps @ 72 °F / 22 °C
FREEZING POINT	-23 °F / -31 °C
BOILING POINT	225 °F / 107 °C
VOC CONTENT	0.00 % EPA Method 24



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :

Stable under normal conditions.

HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Extremes of temperature

MATERIALS TO AVOID :

Metals

HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :

This product is not expected to be a sensitizer.

CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: Moderate

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The tests for (products or similar products) were performed in clean water as set forth by USEPA (EPA/600/4-90/027). In order to evaluate the potential toxicity mitigation, the tests for (representative polymers) were performed in environmentally relevant water with dissolved organic carbon (DOC: 4.5 mg/l). The toxicity of this product is due to an external mode of action, e.g., suffocation or immobilization. In the presence of suspended material, e.g., DOC, the polymers are bound to suspended material and the bioavailability is substantially reduced. As a result, the toxicity is expected to be lower. Under normal use and discharge conditions, the LC50 values of the representative polymers tested in the presence of DOC are expected to apply to this product. However, for large spills, the clean water data is more applicable.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	6.8 mg/l	Product tested in clean water
Fathead Minnow	96 hrs	18 mg/l	Product tested in clean water
Zebra Danio	96 hrs	10 - 100 mg/l	Representative polymer tested in water with DOC

ADDITIONAL ECOLOGICAL DATA

NOEC on earthworm: > 1000 mg/l (representative polymer) Product contains organic halogens, may contribute to AOX.

PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 18,100 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	0 mg/l	Product

Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.

MOBILITY :

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	30 - 50%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL

This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

OTHER INFORMATION

The hazard characterization is based on the tests or potential hazard in the clean water.

If released into the environment, see CERCLA/SUPERFUND in Section 15.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :

PRODUCT IS NOT REGULATED DURING
TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :

PRODUCT IS NOT REGULATED DURING
TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :

PRODUCT IS NOT REGULATED DURING
TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Aluminum Hydroxychloride : Exposure Limit - Compound Class, Eye irritant
Aluminum Phosphate : Eye irritant
Calcium Chloride : Eye irritant

CERCLA/SUPERFUND, 40 CFR 117, 302 :

Notification of spills of this product is not required.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 176.170 Components of paper and paperboard in contact with aqueous and fatty foods and 21 CFR 176.180 Components of paper and paperboard in contact with dry foods.

The following limitations apply: 1) For use as a retention aid employed prior to the sheet-forming operation and used at a level not to exceed that necessary to accomplish the intended technical effect. 2) At the size press at a level not to exceed 0.3% by weight (as product) of the finished paper or paperboard.

NSF INTERNATIONAL :

This product has received NSF/International certification under NSF/ANSI Standard 60 in the coagulation and flocculation category. The official name is "Polymer Blends." Maximum product application dosage is : 102 mg/l.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone

Depleting Substances) :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

CALIFORNIA PROPOSITION 65 :

Substances known to the State of California to cause cancer are present as an impurity or residue.

MICHIGAN CRITICAL MATERIALS :

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :

The following substances are disclosed for compliance with State Right to Know Laws:

Aluminum Hydroxchloride	1327-41-9
Polyquaternary Amine Chloride	Proprietary
Aluminum Phosphate	13530-50-2
Calcium Chloride	10043-52-4
Water	7732-18-5

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :

D2B - Materials Causing Other Toxic Effects - Toxic Material

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

KOREA

All substances in this product comply with the Toxic Chemical Control Law (TCCCL) and are listed on the Existing Chemicals List (ECL)

PHILIPPINES

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

- * The human risk is: Low
- * The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.



SAFETY DATA SHEET

PRODUCT

ULTRION® 8157

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 07/31/2009
Version Number : 1.13



Product Bulletin

OPTIMER[®] 7192 PLUS

Cationic Flocculant

PRODUCT BENEFITS

OPTIMER 7192 PLUS cationic emulsion flocculant is designed for industrial sludge dewatering, sludge thickening and wastewater clarification. This product functions well with all types of equipment including twin-belt presses, screw presses, dissolved air flotation/induced air flotation, plate-and-frame presses, vacuum filter presses, as well as high shear applications.

PRINCIPAL USES

GENERAL DESCRIPTION

Form:	Liquid
Color:	Colorless, light yellow
Odor:	Hydrocarbon
Specific Gravity @ 77°F (25°C):	1.01 - 1.04
Density:	8.4 - 8.7 lb/gal
Solubility in Water:	Emulsifiable
pH (100%):	5
Viscosity @ 77°F (25°C):	300 - 800 cp
Freeze Point:	-1°F (30°C)
Freeze-Thaw Recoverable:	Complete
VOC Content:	28%

ACTIVE CONSTITUENTS

Acrylamide co-polymer, medium-low cationic charge.

REGULATORY APPROVALS

Please refer to the Material Safety Data Sheet (MSDS) for the most recent approval information.

MATERIALS OF COMPATIBILITY

Compatible	Not Compatible
Hasteloy C-276	Stainless Steel 304 and 316
Inconel 625	Polyethylene tubing

Viton
Teflon
Polyethylene (rigid)
Polypropylene (rigid)
CPVC (rigid)
Plasite 4300 (vinyl ester resin)
Plasite 7122 (epoxy phenolic)

Brass
Neoprene
Buna-N Rubber
Natural Rubber
Polyurethane
Hypalon
EPDM
Mild Steel
Galvanized Steel

NOTE: Feed Systems Acceptable Materials

Utilize plastic piping and fittings where possible on neat polymer feed lines. Where strength is needed, 316 SS pumps, valves, etc. can be used. However, these components, especially pump internals, will have a reduced life span. Be sure to routinely inspect all 316 SS components for signs of corrosion and to utilize check valves with Teflon or epoxy coated springs.

DOSAGE AND FEEDING

OPTIMER 7192 PLUS should be fed via a closed feed system. A closed feed system is defined as a system in which fluid is moved from a closed storage vessel into a treated media without exposure to the atmosphere (except through normal venting or pressure devices).

Emulsion flocculants must be fed following proper makeup procedures. Suitable inversion systems should be utilized to allow for adequate inversion and feeding control. The quality of water used to invert the polymer is important. Avoid using plant recycle water or other water sources high in suspended solids, mineral salts and iron, and with a pH either below 6.5 or above 7.8. A dilution aging tank is highly recommended, with a minimum of 30 minutes aging in order to gain full product activity. Inverting the emulsion flocculant below a concentration of 0.2%, or above a concentration of 1.0%, is not recommended. A positive displacement pump is recommended for feeding the inverted material to the treatment system.

In some cases, continuous dilution of pre-inverted flocculant will enhance activity and generate more cost-effective results. Improved performance using dilution water is site specific. To determine if post-dilution is advantageous, feed inverted product through a standard mixing tee to an active dilution water line. The water temperature should be close to ambient and low on suspended solids, mineral salts and iron.

In most cases, inverted flocculant should be fed on the discharge side of the feed pump. There may be isolated cases where the additional mixing rendered by distributing the polymer on the suction side of the pump will yield better program results.

ENVIRONMENTAL AND TOXICITY DATA

Refer to the Material Safety Data Sheet, SECTIONS 11 and 12, for the most current data.

SAFETY AND HANDLING

As with any chemical, OPTIMER 7192 PLUS should be handled with responsible care. When considering the use of OPTIMER 7192 PLUS in a particular application, the Material Safety Data Sheet must be reviewed to assure that the intended use can be accomplished safely. All precautions described in the MSDS should be strictly followed when handling OPTIMER 7192 PLUS. In case of small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Smaller spills can be effectively cleaned up with NALCO POLYCLEAN 7.

STORAGE

Keep containers closed and protect from frost and moisture. Low temperatures should be avoided since viscosity increases and pumping problems can occur. When frozen, warm the product slowly to ambient temperature and agitate with a low (<200) RPM mixer. After warming up to 46 - 50°F (8 -10°C) and re-homogenization by gentle agitation for about 2 hrs, the product can be re-used without loss in efficiency. Nevertheless freezing should be avoided. When the product has been exposed to heat, the product should be gently agitated while its temperature is allowed to lower to room temperature. After the product is back to room temperature, about 2 hrs of gentle agitation should be sufficient to make the product ready for use. While product performance should not be affected if the product freezes or warms up, some loss in physical stability should be expected. If the product is to be stored for longer than two weeks, i.e., bulk tank storage, periodic agitation of the product will help keep the product fully homogenized and ensure consistent performance.

SHIPPING

REMARKS

If you need assistance or information, please call your nearest Ondo Nalco Representative, or our Naperville office at (630) 305-1000. For more news about Ondo Nalco, visit our website at www.ondo-nalco.com.

For Medical and Transportation Emergencies involving Ondo Nalco products, call (24-hour response): 1-800-424-9300.

ADDITIONAL INFORMATION

Product Viscosity vs. Temperature

Viscosity (cp)	Temperature
6000	-5°C (23°F)
1300	11°C (51.8°F)
500	24°C (75.2°F)

Product Viscosity vs. Concentration

% Solution	Viscosity (cp)
1.5	600
1.0	340
0.5	220

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Appendix C

**PADEP Chapter 102 Requirements & Stormwater
Runoff/Capacity Calculations**

STANDARD WORKSHEET # 12

Sediment Basin Capacity Requirements

PROJECT NAME:	Specialty Granules, Inc.	
LOCATION:	Pond 2 and 3	
PREPARED BY:	TWS	DATE: 09/23/2011
REVISED BY:	RKF	9/5/12
CHECKED BY:	DM	9/6/12

BASIN NUMBER		Pond 2 & 3
(A) MAXIMUM TOTAL DRAINAGE AREA (AC)	*****	195,500
(I) INITIAL REQ'D SETTLING VOLUME (5000 x A) (CF)		977,500
(T) REDUCTION FOR TOP DEWATERING (-700 x A) (CF)		0
(P) REDUCTION FOR PERMANENT POOL (-700 x A) (CF)		0
(L) RED. FOR 4:1 FLOW LENGTH:WIDTH (-350 x A) (CF)		0
(D) RED. FOR 4 TO 7 DAY DEWATERING (-350 x A) (CF)		0
*** (Sv) REQUIRED SETTLING VOLUME [I- (T+P+L+D)] (CF)		977,500
(Sd) REQ'D SEDIMENT STORAGE VOLUME (1000 x A) ¹ (CF)		977,500
(St) TOTAL REQ'D STORAGE VOLUME (Sv + Sd) (CF)		1,955,000
**** TOTAL STORAGE VOLUME PROVIDED (CF)		1,985,175
REQUIRED DISCHARGE CAPACITY (2 x A) (cfs)		391.0
PRINCIPAL SPILLWAY CAPACITY (@ ELEV 5) (cfs)		25.40
EMERGENCY SPILLWAY CAPACITY (@ ELEV 5) (cfs)		750.32
EMERGENCY SPILLWAY PROTECTIVE LINING		Rip Rap

- * Provide supporting computations.
- ** If grass lining is proposed, spillway must be constructed in original ground
- *** 5000 cubic feet per acre settling volume is required for basins located in Special protection (HQ & EV) watersheds. In other watersheds, the basin settling volume may be reduced per the Department's "Erosion and Sediment Pollution Control Manual," No. 363-2134-008 (January 1996), as amended and updated. The minimum settling volume for such basins is (3600 X A).
- **** Total Storage Volume provided at riser crest.
- ***** Since 9.14-cfs (4,100GPM, max.) is being proposed to be pumped from Sed.Traps 6 & 7, Pitts Pond and Pitts Quarry, using 2-cfs x drainage acre for storage calculations then, 5.0 additional acres are added to the 190.5-acre "Natural Drainage Area"

STANDARD WORKSHEET # 14

Sediment Basin Storage Data - POND #2

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Proposed Pond 2

PREPARED BY: TWS

REVISED BY: RKF

CHECKED BY: DM

DATE:

DATE: 09/23/11

DATE: 9/5/12

DATE: 9/6/12

DATE:

WATER SURFACE ELEVATION (FEET)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FEET)	STORAGE VOLUME (CUBIC FEET)		REMARKS
				INCREMENTAL	TOTAL	
913.00	1,317				0	
914.00	15,525	8,421	1.00	8,421		
915.00	22,827	19,176	1.00	19,176	8,421	
916.00	28,006	25,417	1.00	25,417	27,597	
917.00	31,725	29,866	1.00	29,866	53,014	
918.00	35,680	33,703	1.00	33,703	82,879	
919.00	39,456	37,568	1.00	37,568	116,582	
920.00	43,118	41,287	1.00	41,287	154,150	
921.00	47,102	45,110	1.00	45,110	195,437	
922.00	51,008	49,055	1.00	49,055	240,547	
923.00	54,386	52,697	1.00	52,697	289,602	
924.00	57,945	56,166	1.00	56,166	342,299	
925.00	61,875	59,910	1.00	59,910	398,464	
926.00	66,220	64,048	1.00	64,048	458,374	
927.00	70,925	68,573	1.00	68,573	522,422	
928.00	75,702	73,314	1.00	73,314	590,994	
929.00	79,901	77,802	1.00	77,802	664,308	
930.00	84,059	81,980	1.00	81,980	742,109	
931.00	87,907	85,983	1.00	85,983	824,089	
932.00	91,616	89,762	1.00	89,762	910,072	
932.75	93,926	93,156	0.75	69,867	999,834	Sediment Level
933.00	94,696	94,826	0.25	23,706	1,069,701	
933.40	95,725	95,211	0.40	38,084	1,093,407	
934.00	97,191	96,458	0.60	57,875	1,131,491	
935.00	99,591	98,391	1.00	98,391	1,189,366	
936.00	102,043	100,817	1.00	100,817	1,287,757	
937.00	104,551	103,297	1.00	103,297	1,388,574	
938.00	107,094	105,823	1.00	105,823	1,491,871	
940.00	112,224	109,659	2.00	219,318	1,597,693	
941.65	116,279	114,252	1.65	188,515	1,817,011	
945.00	125,017	120,648	3.35	404,171	2,005,526	Approximate Elevation of Lowest Outfall
946.00	126,410	125,714	1.00	125,714	2,409,697	
					2,535,411	

STANDARD WORKSHEET # 14 **Sediment Basin Storage Data - POND #3**

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Proposed Pond 3

PREPARED BY: TWS

REVISED BY: RKF

CHECKED BY: DM

CHECKED BY:

DATE: 09/23/11

DATE: 9/5/12

DATE: 9/6/12

DATE:

WATER SURFACE ELEVATION (FEET)	AREA (SQ. FT.)	AVERAGE AREA (SQ. FT.)	DIFFERENCE IN ELEVATION (FEET)	STORAGE VOLUME (CUBIC FEET)		REMARKS
				INCREMENTAL	TOTAL	
911.00	1,560				0	
912.00	4,949	3,255	1.00	3,255		
913.00	9,391	7,170	1.00	7,170	3,255	
914.00	12,217	10,804	1.00	10,804	10,425	
915.00	14,810	13,514	1.00	13,514	21,229	
916.00	18,459	16,635	1.00	16,635	34,742	
917.00	21,365	19,912	1.00	19,912	51,377	
918.00	23,943	22,654	1.00	22,654	71,289	
919.00	26,470	25,207	1.00	25,207	93,943	
920.00	29,283	27,877	1.00	27,877	119,149	
921.00	31,714	30,499	1.00	30,499	147,026	
922.00	34,077	32,896	1.00	32,896	177,524	
923.00	36,801	35,439	1.00	35,439	210,420	
924.00	40,489	38,645	1.00	38,645	245,859	
925.00	47,189	43,839	1.00	43,839	284,504	
926.00	51,664	49,427	1.00	49,427	328,343	
927.00	55,766	53,715	1.00	53,715	377,769	
928.00	59,960	57,863	1.00	57,863	431,484	
929.00	64,411	62,186	1.00	62,186	489,347	
930.00	69,409	66,910	1.00	66,910	551,533	
931.00	73,824	71,617	1.00	71,617	618,443	
931.80	76,027	74,926	0.80	59,940	690,059	
932.00	76,399	76,213	0.20	15,243	749,999	
933.00	78,168	77,284	1.00	77,284	765,242	
934.00	79,942	79,055	1.00	79,055	842,526	
935.00	81,770	80,856	1.00	80,856	921,581	
936.00	83,941	82,856	1.00	82,856	1,002,437	
940.00	110,856	97,400	4.00	389,598	1,085,292	
941.00	116,685	113,771	1.00	113,771	1,474,890	
944.00	127,157	121,921	3.00	365,762	1,588,661	
945.00	130,800	128,979	1.00	128,979	1,954,424	
946.00	134,466	132,633	1.00	132,633	2,083,402	
					2,216,035	

WORKSHEET # 15

Sediment Basin Dewatering Discharge Data

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Pond 2

PREPARED BY: RKF

CHECKED BY: ARZ

DATE: 9/27/12

DATE: 9/28/12

REV'D.: _____

PERFORATION DISCHARGE (TOP OF RISER TO SEDIMENT CLEAN OUT ELEVATION)

WATER SURFACE ELEVATION 1	RISER ORIFICE ROW ELEVATION 2									TOTAL DISCHARGE (CFS) 3
	ROW 1	ROW 2	ROW 3	ROW 4	ROW 5	ROW 6	ROW 7	ROW 8	ROW 9	
941.47	932.50	933.50	934.50	935.50	936.50	937.5	938.5	939.5	940.5	4.0
938.00	0.629	0.593	0.555	0.513	0.468	0.419	0.362	0.295	0.207	2.1
937.00	0.493	0.446	0.393	0.332	0.257	0.149				1.6
936.00	0.446	0.393	0.332	0.257	0.149					1.1
935.00	0.393	0.332	0.257	0.149						0.7
934.00	0.332	0.257	0.149							0.4
932.50	0.257	0.149								0.0
	0.000									

1 FROM WORKSHEET #14: TOP ELEVATION IS TOP OF DEWATERING ZONE (ELEV. 3 ON WORKSHEET #13), AND BOTTOM ELEVATION IS TOP OF SEDIMENT STORAGE ZONE (ELEVATION 2 ON WORKSHEET #13).

2 ALL PERFORATIONS SHOULD BE THE SAME SIZE. ONE INCH DIAMETER PERFORATINOS ARE PREFERRED.
SPECIFY SIZE OF PERFORATIONS 1 INCH DIAMETER.
EACH ORIFICE ROW SHOULD HAVE APPROXIMATELY THE SAME NUMBER OF PERFORATIONS AND THE ORIFICE ROWS SHOULD BE EQUALLY SPACED VERTICALLY.
SPECIFY THE NUMBER OF PERFORATIONS IN EACH ROW. 8

3 INSERT VALUE INTO COLUMN 4 OF STANDARD WORKSHEET #16

NOTE: WHERE FAIRCLOTH STYLE SKIMMERS ARE USED, FIGURE 7.2, WITH BASIN DEWATERING VOLUME AND SKIMMER ORIFICE SIZE PLOTTED, SHOULD BE SUBMITTED IN LIEU OF STANDARD WORKSHEETS #15 & 16.

Orifice Flow

$$Q=CA(2gh)^{1/2}$$

$$\text{Area per Row} = 0.04363 \text{ S.F.}$$

$$\text{Orifice Coeff.} = 0.6$$

WORKSHEET # 16

Sediment Basin Dewatering Time Data

PROJECT NAME: Specialty Granules, Inc.

LOCATION: Pond 2

PREPARED BY: RKF

CHECKED BY: ARZ

DATE: 9/27/12

DATE: 9/28/12

REV'D.:

WATER SURFACE ELEVATION 1	STORAGE VOLUME (CU. FT.) 2	INCREMENTAL STORAGE VOLUME (CU. FT.)	DISCHARGE (CFS) 3	AVERAGE DISCHARGE (CFS)	TIME (HRS.)	ACCUMULATED TIME (HRS.)
941.47	1,985,175		4.041			0.00
		387,482		3.06	35.23	
938.00	1,597,693		2.069			35.23
		105,822		1.82	16.12	
937.00	1,491,871		1.577			51.35
		103,297		1.35	21.19	
936.00	1,388,574		1.131			72.54
		100,817		0.93	29.97	
935.00	1,287,757		0.738			102.51
		98,391		0.57	47.78	
934.00	1,189,366		0.406			150.29
		189,366		0.20	259.21	
932.50	1,000,000		0.000			409.50

Dewatering Time 409 Hours = 17.1 Days

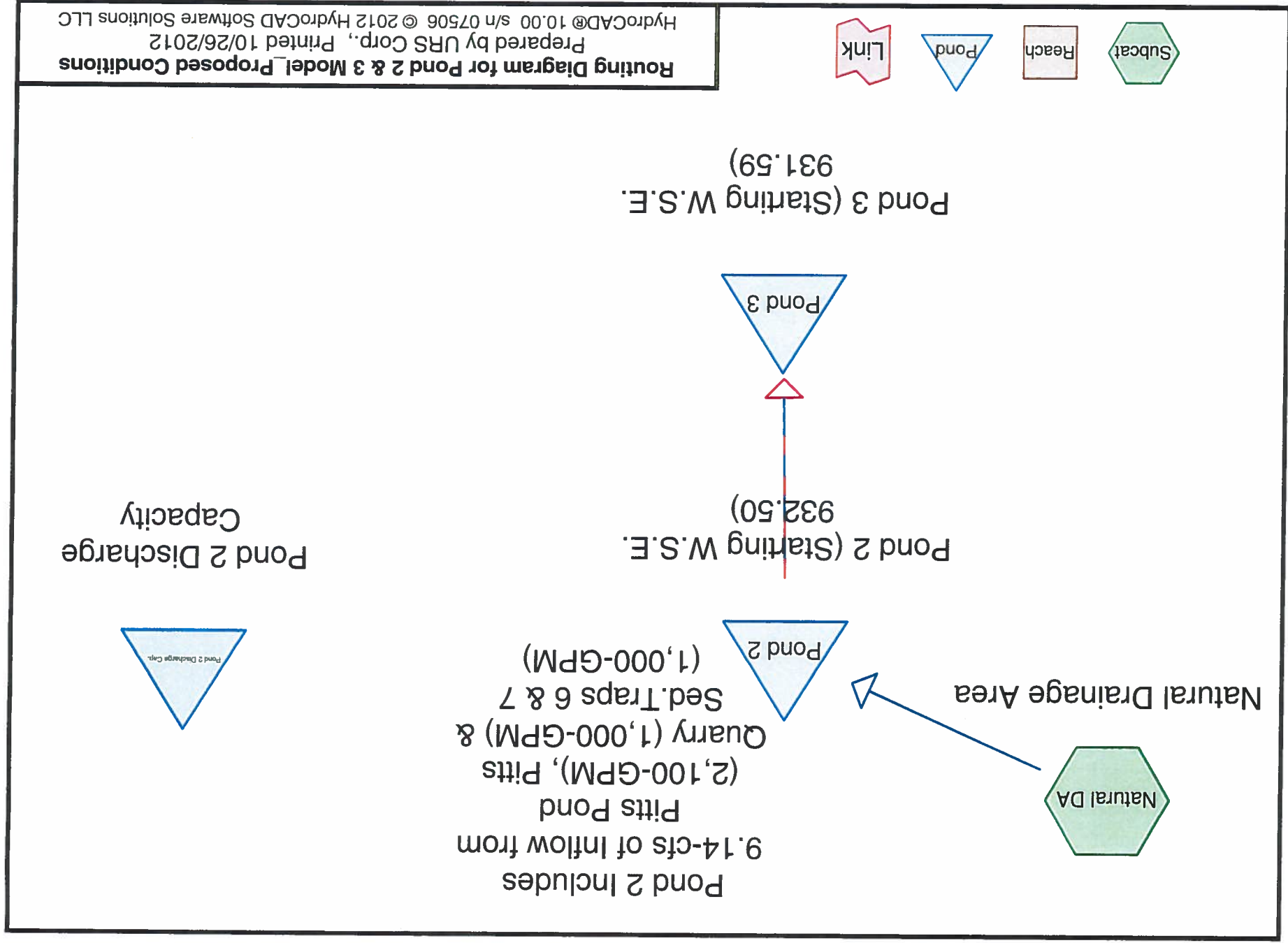
1 From Worksheet #15, first column

of Risers= 4

2 From Worksheet #14, sixth column

Final Dewatering Time= 4.3 Days

3 From Worksheet #15, last column



Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Page 1

Summary for Subcatchment Natural DA: Natural Drainage Area

Runoff = 776.08 cfs @ 12.07 hrs, Volume= 50.538 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.80"

	Area (ac)	CN	Description
	61.270	70	Woods, Good, HSG C
*	90.980	89	Mining Support Area
*	38.240	98	Imperv., Buildings, & Ponds
	190.490	85	Weighted Average
	152.250		79.93% Pervious Area
	38.240		20.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Summary for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Additional 9.14-cfs Inflow from Pitts Pond (2,100GPM), Pitts Quarry (1,000GPM), & Sed. Traps 6 & 7 (1,000GPM) Is Included

Inflow Area =	190.490 ac,	20.07% Impervious,	Inflow Depth > 6.61"	for 10-yr event
Inflow =	785.22 cfs @	12.07 hrs,	Volume=	104,933 af, Incl. 9.14 cfs Base Flow
Outflow =	612.18 cfs @	12.16 hrs,	Volume=	80,867 af, Atten= 22%, Lag= 5.2 min
Primary =	23.78 cfs @	12.16 hrs,	Volume=	42,856 af
Secondary =	588.39 cfs @	12.16 hrs,	Volume=	38,012 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 932.50' Surf.Area= 0 sf Storage= 1,046,412 cf

Peak Elev= 943.77' @ 12.16 hrs Surf.Area= 0 sf Storage= 2,261,776 cf (1,215,364 cf above start)

Plug-Flow detention time= 1,548.6 min calculated for 56.841 af (54% of inflow)

Center-of-Mass det. time= 292.2 min (1,804.1 - 1,511.9)

Volume	Invert	Avail.Storage	Storage Description
--------	--------	---------------	---------------------

#1	913.00'	2,535,411 cf	Custom Stage Data Listed below
----	---------	--------------	--------------------------------

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

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Elevation (feet)	Cum.Store (cubic-feet)
913.00	0
914.00	8,421
915.00	27,597
916.00	53,014
917.00	82,879
918.00	116,582
919.00	154,150
920.00	195,437
921.00	240,547
922.00	289,602
923.00	342,299
924.00	398,464
925.00	458,374
926.00	522,422
927.00	590,994
928.00	664,308
929.00	742,109
930.00	824,089
931.00	910,072
932.00	999,834
932.75	1,069,701
933.00	1,093,407
933.40	1,131,491
934.00	1,189,366
935.00	1,287,757
936.00	1,388,574
937.00	1,491,871
938.00	1,597,693
940.00	1,817,011
941.65	2,005,526
945.00	2,409,697
946.00	2,535,411

Device	Routing	Invert	Outlet Devices
#1	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 82.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.18' S= 0.1377 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.47' S= 0.1375 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 931.42' S= 0.1256 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.70' S= 0.1346 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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#5	Primary	941.47'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 940.28' S= 0.0238 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#6	Primary	941.62'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.62' / 940.20' S= 0.0284 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#7	Secondary	942.50'	80.0' long x 40.0' breadth 80' Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#8	Secondary	942.50'	25.0' long x 40.0' breadth 25' Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#9	Secondary	942.50'	50.0' long x 40.0' breadth 50' Emergency Spillway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=23.78 cfs @ 12.16 hrs HW=943.77' TW=933.80' (Dynamic Tailwater)

- 1=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 2=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 3=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 4=Top of 8" Perf. Riser (Inlet Controls 1.86 cfs @ 5.33 fps)
- 5=18" Culvert (Inlet Controls 8.37 cfs @ 4.74 fps)
- 6=18" Culvert (Inlet Controls 7.96 cfs @ 4.50 fps)

Secondary OutFlow Max=587.64 cfs @ 12.16 hrs HW=943.77' TW=933.80' (Dynamic Tailwater)

- 7=80' Emergency Spillway (Weir Controls 303.30 cfs @ 2.98 fps)
- 8=25' Emergency Spillway (Weir Controls 94.78 cfs @ 2.98 fps)
- 9=50' Emergency Spillway (Weir Controls 189.56 cfs @ 2.98 fps)

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	9.14	1,046,577	932.50	0.00	0.00	0.00
0.20	9.14	1,053,157	932.57	0.00	0.00	0.00
0.40	9.14	1,059,738	932.64	0.00	0.00	0.00
0.60	9.14	1,066,319	932.71	0.00	0.00	0.00
0.80	9.14	1,072,900	932.78	0.00	0.00	0.00
1.00	9.14	1,079,481	932.85	0.00	0.00	0.00
1.20	9.14	1,086,061	932.92	0.00	0.00	0.00
1.40	9.14	1,092,642	932.99	0.00	0.00	0.00
1.60	9.14	1,099,223	933.06	0.00	0.00	0.00
1.80	9.14	1,105,804	933.13	0.00	0.00	0.00
2.00	9.14	1,112,385	933.20	0.00	0.00	0.00
2.20	9.14	1,118,965	933.27	0.00	0.00	0.00
2.40	9.14	1,125,546	933.34	0.00	0.00	0.00
2.60	9.14	1,132,127	933.41	0.00	0.00	0.00
2.80	9.14	1,138,708	933.47	0.00	0.00	0.00
3.00	9.14	1,145,289	933.54	0.00	0.00	0.00
3.20	9.14	1,151,869	933.61	0.00	0.00	0.00
3.40	9.14	1,158,450	933.68	0.00	0.00	0.00
3.60	9.14	1,165,031	933.75	0.00	0.00	0.00
3.80	9.14	1,171,612	933.82	0.00	0.00	0.00
4.00	9.14	1,178,193	933.88	0.00	0.00	0.00
4.20	9.14	1,184,773	933.95	0.00	0.00	0.00
4.40	9.14	1,191,354	934.02	0.00	0.00	0.00
4.60	9.14	1,197,935	934.09	0.00	0.00	0.00
4.80	9.14	1,204,516	934.15	0.00	0.00	0.00
5.00	9.14	1,211,097	934.22	0.00	0.00	0.00
5.20	9.14	1,217,677	934.29	0.00	0.00	0.00
5.40	9.14	1,224,258	934.35	0.00	0.00	0.00
5.60	9.14	1,230,839	934.42	0.00	0.00	0.00
5.80	9.16	1,237,422	934.49	0.00	0.00	0.00
6.00	9.36	1,244,079	934.56	0.00	0.00	0.00
6.20	9.66	1,250,925	934.63	0.00	0.00	0.00
6.40	9.98	1,257,997	934.70	0.00	0.00	0.00
6.60	10.32	1,265,307	934.77	0.00	0.00	0.00
6.80	10.67	1,272,862	934.85	0.00	0.00	0.00
7.00	11.03	1,280,672	934.93	0.00	0.00	0.00
7.20	11.39	1,288,742	935.01	0.00	0.00	0.00
7.40	11.77	1,297,082	935.09	0.00	0.00	0.00
7.60	12.16	1,305,696	935.18	0.00	0.00	0.00
7.80	12.55	1,314,592	935.27	0.00	0.00	0.00
8.00	12.96	1,323,777	935.36	0.00	0.00	0.00
8.20	13.41	1,333,261	935.45	0.00	0.00	0.00
8.40	14.10	1,343,155	935.55	0.00	0.00	0.00
8.60	14.93	1,353,603	935.65	0.00	0.00	0.00
8.80	15.86	1,364,686	935.76	0.00	0.00	0.00
9.00	16.87	1,376,468	935.88	0.00	0.00	0.00
9.20	17.90	1,389,001	936.00	0.00	0.00	0.00
9.40	18.61	1,402,164	936.13	0.00	0.00	0.00
9.60	19.20	1,415,781	936.26	0.00	0.00	0.00
9.80	20.22	1,429,925	936.40	0.00	0.00	0.00
10.00	21.82	1,445,048	936.55	0.00	0.00	0.00
10.20	23.72	1,461,425	936.71	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	26.18	1,479,369	936.88	0.00	0.00	0.00
10.60	29.01	1,499,227	937.07	0.00	0.00	0.00
10.80	32.69	1,521,365	937.28	0.00	0.00	0.00
11.00	37.40	1,546,569	937.52	0.00	0.00	0.00
11.20	43.35	1,575,472	937.79	0.00	0.00	0.00
11.40	53.46	1,610,126	938.11	0.00	0.00	0.00
11.60	67.97	1,653,183	938.51	0.00	0.00	0.00
11.80	203.88	1,737,091	939.27	0.00	0.00	0.00
12.00	670.79	2,023,776	941.80	1.66	1.66	0.00
12.20	472.93	2,253,333	943.70	563.84	23.26	540.58
12.40	180.68	2,187,738	943.16	241.71	18.67	223.05
12.60	108.82	2,159,766	942.93	133.73	16.35	117.38
12.80	79.33	2,146,846	942.82	91.07	15.06	76.01
13.00	68.55	2,141,141	942.77	74.21	14.45	59.76
13.20	60.49	2,137,684	942.75	64.65	14.07	50.59
13.40	55.09	2,135,182	942.72	58.06	13.79	44.28
13.60	50.52	2,133,224	942.71	53.12	13.57	39.55
13.80	46.60	2,131,482	942.69	48.78	13.29	35.49
14.00	43.27	2,130,105	942.68	45.05	12.64	32.41
14.20	40.31	2,128,902	942.67	41.82	12.03	29.79
14.40	38.67	2,128,208	942.67	39.11	10.79	28.32
14.60	37.49	2,128,096	942.67	37.49	9.41	28.08
14.80	36.37	2,128,156	942.67	36.25	8.05	28.21
15.00	35.25	2,128,272	942.67	35.07	6.62	28.45
15.20	34.12	2,128,693	942.67	32.77	5.22	27.55
15.40	33.00	2,129,888	942.68	31.37	4.49	26.88
15.60	31.86	2,130,822	942.69	30.96	4.17	26.79
15.80	30.72	2,131,209	942.69	30.55	4.00	26.54
16.00	29.58	2,131,143	942.69	29.94	3.91	26.03
16.20	28.53	2,130,764	942.69	29.19	3.85	25.34
16.40	27.95	2,130,301	942.68	28.58	3.84	24.74
16.60	27.52	2,129,868	942.68	28.11	3.85	24.27
16.80	27.12	2,129,457	942.68	27.69	3.86	23.83
17.00	26.71	2,129,059	942.67	27.27	3.87	23.40
17.20	26.31	2,128,668	942.67	26.86	3.88	22.98
17.40	25.90	2,128,281	942.67	26.45	3.89	22.56
17.60	25.50	2,127,895	942.66	26.04	3.90	22.14
17.80	25.09	2,127,508	942.66	25.64	3.92	21.72
18.00	24.68	2,127,120	942.66	25.23	3.93	21.30
18.20	24.27	2,126,731	942.65	24.82	3.95	20.88
18.40	23.86	2,126,339	942.65	24.42	3.96	20.45
18.60	23.45	2,125,945	942.65	24.01	3.98	20.03
18.80	23.04	2,125,550	942.64	23.60	4.00	19.60
19.00	22.63	2,125,151	942.64	23.19	4.02	19.17
19.20	22.22	2,124,751	942.64	22.78	4.05	18.73
19.40	21.80	2,124,348	942.63	22.37	4.08	18.30
19.60	21.39	2,123,944	942.63	21.96	4.11	17.85
19.80	20.97	2,123,537	942.63	21.55	4.14	17.41
20.00	20.56	2,123,128	942.62	21.13	4.18	16.96
20.20	20.19	2,122,723	942.62	20.73	4.22	16.51
20.40	20.02	2,122,381	942.62	20.44	4.27	16.16
20.60	19.93	2,122,122	942.62	20.25	4.34	15.92

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
20.80	19.85	2,121,916	942.61	20.12	4.40	15.72
21.00	19.77	2,121,742	942.61	20.00	4.45	15.55
21.20	19.69	2,121,590	942.61	19.89	4.50	15.39
21.40	19.61	2,121,455	942.61	19.79	4.55	15.24
21.60	19.53	2,121,334	942.61	19.69	4.59	15.10
21.80	19.45	2,121,224	942.61	19.60	4.64	14.96
22.00	19.37	2,121,131	942.61	19.48	4.70	14.78
22.20	19.29	2,121,049	942.61	19.41	4.76	14.65
22.40	19.20	2,120,964	942.61	19.33	4.83	14.50
22.60	19.12	2,120,876	942.61	19.25	4.90	14.35
22.80	19.04	2,120,786	942.61	19.17	4.97	14.20
23.00	18.96	2,120,693	942.60	19.10	5.05	14.05
23.20	18.88	2,120,598	942.60	19.02	5.13	13.89
23.40	18.80	2,120,501	942.60	18.94	5.21	13.73
23.60	18.72	2,120,403	942.60	18.86	5.29	13.56
23.80	18.63	2,120,303	942.60	18.78	5.38	13.40
24.00	18.55	2,120,202	942.60	18.70	5.47	13.23
24.20	14.29	2,119,439	942.59	17.45	5.45	12.01
24.40	9.87	2,116,683	942.57	13.28	5.36	7.91
24.60	9.23	2,114,802	942.56	11.19	5.72	5.47
24.80	9.14	2,113,677	942.55	10.41	6.25	4.15
25.00	9.14	2,112,892	942.54	10.10	6.78	3.31
25.20	9.14	2,112,262	942.53	9.95	7.27	2.68
25.40	9.14	2,111,710	942.53	9.87	7.70	2.17
25.60	9.14	2,111,206	942.53	9.82	8.08	1.74
25.80	9.14	2,110,734	942.52	9.78	8.42	1.36
26.00	9.14	2,110,285	942.52	9.75	8.72	1.03
26.20	9.14	2,109,852	942.51	9.73	8.99	0.74
26.40	9.14	2,109,429	942.51	9.72	9.23	0.49
26.60	9.14	2,109,006	942.51	9.74	9.44	0.30
26.80	9.14	2,108,571	942.50	9.75	9.63	0.12
27.00	9.14	2,108,127	942.50	9.76	9.76	0.01
27.20	9.14	2,107,650	942.50	9.84	9.84	0.00
27.40	9.14	2,107,130	942.49	9.87	9.87	0.00
27.60	9.14	2,106,603	942.49	9.87	9.87	0.00
27.80	9.14	2,106,074	942.48	9.88	9.88	0.00
28.00	9.14	2,105,544	942.48	9.88	9.88	0.00
28.20	9.14	2,105,015	942.47	9.87	9.87	0.00
28.40	9.14	2,104,490	942.47	9.86	9.86	0.00
28.60	9.14	2,103,974	942.47	9.85	9.85	0.00
28.80	9.14	2,103,468	942.46	9.84	9.84	0.00
29.00	9.14	2,102,972	942.46	9.82	9.82	0.00
29.20	9.14	2,102,488	942.45	9.80	9.80	0.00
29.40	9.14	2,102,015	942.45	9.79	9.79	0.00
29.60	9.14	2,101,556	942.45	9.77	9.77	0.00
29.80	9.14	2,101,108	942.44	9.75	9.75	0.00
30.00	9.14	2,100,674	942.44	9.73	9.73	0.00
30.20	9.14	2,100,252	942.44	9.72	9.72	0.00
30.40	9.14	2,099,845	942.43	9.69	9.69	0.00
30.60	9.14	2,099,457	942.43	9.66	9.66	0.00
30.80	9.14	2,099,091	942.43	9.63	9.63	0.00
31.00	9.14	2,098,748	942.42	9.60	9.60	0.00

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
31.20	9.14	2,098,428	942.42	9.57	9.57	0.00
31.40	9.14	2,098,132	942.42	9.53	9.53	0.00
31.60	9.14	2,097,860	942.42	9.50	9.50	0.00
31.80	9.14	2,097,609	942.41	9.47	9.47	0.00
32.00	9.14	2,097,378	942.41	9.45	9.45	0.00
32.20	9.14	2,097,165	942.41	9.42	9.42	0.00
32.40	9.14	2,096,970	942.41	9.40	9.40	0.00
32.60	9.14	2,096,789	942.41	9.38	9.38	0.00
32.80	9.14	2,096,623	942.41	9.36	9.36	0.00
33.00	9.14	2,096,471	942.40	9.34	9.34	0.00
33.20	9.14	2,096,330	942.40	9.33	9.33	0.00
33.40	9.14	2,096,201	942.40	9.31	9.31	0.00
33.60	9.14	2,096,082	942.40	9.30	9.30	0.00
33.80	9.14	2,095,972	942.40	9.29	9.29	0.00
34.00	9.14	2,095,871	942.40	9.27	9.27	0.00
34.20	9.14	2,095,778	942.40	9.26	9.26	0.00
34.40	9.14	2,095,692	942.40	9.25	9.25	0.00
34.60	9.14	2,095,613	942.40	9.25	9.25	0.00
34.80	9.14	2,095,541	942.40	9.24	9.24	0.00
35.00	9.14	2,095,474	942.40	9.23	9.23	0.00
35.20	9.14	2,095,412	942.40	9.22	9.22	0.00
35.40	9.14	2,095,356	942.39	9.22	9.22	0.00
35.60	9.14	2,095,304	942.39	9.21	9.21	0.00
35.80	9.14	2,095,256	942.39	9.20	9.20	0.00
36.00	9.14	2,095,211	942.39	9.20	9.20	0.00
36.20	9.14	2,095,171	942.39	9.19	9.19	0.00
36.40	9.14	2,095,133	942.39	9.19	9.19	0.00
36.60	9.14	2,095,099	942.39	9.19	9.19	0.00
36.80	9.14	2,095,067	942.39	9.18	9.18	0.00
37.00	9.14	2,095,038	942.39	9.18	9.18	0.00
37.20	9.14	2,095,011	942.39	9.18	9.18	0.00
37.40	9.14	2,094,986	942.39	9.17	9.17	0.00
37.60	9.14	2,094,963	942.39	9.17	9.17	0.00
37.80	9.14	2,094,942	942.39	9.17	9.17	0.00
38.00	9.14	2,094,923	942.39	9.17	9.17	0.00
38.20	9.14	2,094,905	942.39	9.16	9.16	0.00
38.40	9.14	2,094,889	942.39	9.16	9.16	0.00
38.60	9.14	2,094,874	942.39	9.16	9.16	0.00
38.80	9.14	2,094,860	942.39	9.16	9.16	0.00
39.00	9.14	2,094,847	942.39	9.16	9.16	0.00
39.20	9.14	2,094,835	942.39	9.16	9.16	0.00
39.40	9.14	2,094,824	942.39	9.15	9.15	0.00
39.60	9.14	2,094,814	942.39	9.15	9.15	0.00
39.80	9.14	2,094,805	942.39	9.15	9.15	0.00
40.00	9.14	2,094,797	942.39	9.15	9.15	0.00
40.20	9.14	2,094,789	942.39	9.15	9.15	0.00
40.40	9.14	2,094,782	942.39	9.15	9.15	0.00
40.60	9.14	2,094,775	942.39	9.15	9.15	0.00
40.80	9.14	2,094,769	942.39	9.15	9.15	0.00
41.00	9.14	2,094,764	942.39	9.15	9.15	0.00
41.20	9.14	2,094,758	942.39	9.15	9.15	0.00
41.40	9.14	2,094,754	942.39	9.15	9.15	0.00

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
41.60	9.14	2,094,749	942.39	9.15	9.15	0.00
41.80	9.14	2,094,745	942.39	9.15	9.15	0.00
42.00	9.14	2,094,742	942.39	9.14	9.14	0.00
42.20	9.14	2,094,738	942.39	9.14	9.14	0.00
42.40	9.14	2,094,735	942.39	9.14	9.14	0.00
42.60	9.14	2,094,732	942.39	9.14	9.14	0.00
42.80	9.14	2,094,730	942.39	9.14	9.14	0.00
43.00	9.14	2,094,727	942.39	9.14	9.14	0.00
43.20	9.14	2,094,725	942.39	9.14	9.14	0.00
43.40	9.14	2,094,723	942.39	9.14	9.14	0.00
43.60	9.14	2,094,721	942.39	9.14	9.14	0.00
43.80	9.14	2,094,719	942.39	9.14	9.14	0.00
44.00	9.14	2,094,717	942.39	9.14	9.14	0.00
44.20	9.14	2,094,716	942.39	9.14	9.14	0.00
44.40	9.14	2,094,715	942.39	9.14	9.14	0.00
44.60	9.14	2,094,713	942.39	9.14	9.14	0.00
44.80	9.14	2,094,712	942.39	9.14	9.14	0.00
45.00	9.14	2,094,711	942.39	9.14	9.14	0.00
45.20	9.14	2,094,710	942.39	9.14	9.14	0.00
45.40	9.14	2,094,709	942.39	9.14	9.14	0.00
45.60	9.14	2,094,708	942.39	9.14	9.14	0.00
45.80	9.14	2,094,707	942.39	9.14	9.14	0.00
46.00	9.14	2,094,706	942.39	9.14	9.14	0.00
46.20	9.14	2,094,706	942.39	9.14	9.14	0.00
46.40	9.14	2,094,705	942.39	9.14	9.14	0.00
46.60	9.14	2,094,705	942.39	9.14	9.14	0.00
46.80	9.14	2,094,704	942.39	9.14	9.14	0.00
47.00	9.14	2,094,704	942.39	9.14	9.14	0.00
47.20	9.14	2,094,703	942.39	9.14	9.14	0.00
47.40	9.14	2,094,703	942.39	9.14	9.14	0.00
47.60	9.14	2,094,703	942.39	9.14	9.14	0.00
47.80	9.14	2,094,702	942.39	9.14	9.14	0.00
48.00	9.14	2,094,702	942.39	9.14	9.14	0.00
48.20	9.14	2,094,702	942.39	9.14	9.14	0.00
48.40	9.14	2,094,701	942.39	9.14	9.14	0.00
48.60	9.14	2,094,701	942.39	9.14	9.14	0.00
48.80	9.14	2,094,701	942.39	9.14	9.14	0.00
49.00	9.14	2,094,701	942.39	9.14	9.14	0.00
49.20	9.14	2,094,701	942.39	9.14	9.14	0.00
49.40	9.14	2,094,701	942.39	9.14	9.14	0.00
49.60	9.14	2,094,701	942.39	9.14	9.14	0.00
49.80	9.14	2,094,700	942.39	9.14	9.14	0.00
50.00	9.14	2,094,700	942.39	9.14	9.14	0.00
50.20	9.14	2,094,700	942.39	9.14	9.14	0.00
50.40	9.14	2,094,700	942.39	9.14	9.14	0.00
50.60	9.14	2,094,700	942.39	9.14	9.14	0.00
50.80	9.14	2,094,700	942.39	9.14	9.14	0.00
51.00	9.14	2,094,700	942.39	9.14	9.14	0.00
51.20	9.14	2,094,700	942.39	9.14	9.14	0.00
51.40	9.14	2,094,700	942.39	9.14	9.14	0.00
51.60	9.14	2,094,699	942.39	9.14	9.14	0.00
51.80	9.14	2,094,699	942.39	9.14	9.14	0.00

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
52.00	9.14	2,094,699	942.39	9.14	9.14	0.00
52.20	9.14	2,094,699	942.39	9.14	9.14	0.00
52.40	9.14	2,094,699	942.39	9.14	9.14	0.00
52.60	9.14	2,094,699	942.39	9.14	9.14	0.00
52.80	9.14	2,094,699	942.39	9.14	9.14	0.00
53.00	9.14	2,094,699	942.39	9.14	9.14	0.00
53.20	9.14	2,094,699	942.39	9.14	9.14	0.00
53.40	9.14	2,094,699	942.39	9.14	9.14	0.00
53.60	9.14	2,094,699	942.39	9.14	9.14	0.00
53.80	9.14	2,094,699	942.39	9.14	9.14	0.00
54.00	9.14	2,094,699	942.39	9.14	9.14	0.00
54.20	9.14	2,094,699	942.39	9.14	9.14	0.00
54.40	9.14	2,094,699	942.39	9.14	9.14	0.00
54.60	9.14	2,094,699	942.39	9.14	9.14	0.00
54.80	9.14	2,094,699	942.39	9.14	9.14	0.00
55.00	9.14	2,094,699	942.39	9.14	9.14	0.00
55.20	9.14	2,094,699	942.39	9.14	9.14	0.00
55.40	9.14	2,094,699	942.39	9.14	9.14	0.00
55.60	9.14	2,094,699	942.39	9.14	9.14	0.00
55.80	9.14	2,094,699	942.39	9.14	9.14	0.00
56.00	9.14	2,094,699	942.39	9.14	9.14	0.00
56.20	9.14	2,094,699	942.39	9.14	9.14	0.00
56.40	9.14	2,094,699	942.39	9.14	9.14	0.00
56.60	9.14	2,094,699	942.39	9.14	9.14	0.00
56.80	9.14	2,094,699	942.39	9.14	9.14	0.00
57.00	9.14	2,094,699	942.39	9.14	9.14	0.00
57.20	9.14	2,094,699	942.39	9.14	9.14	0.00
57.40	9.14	2,094,699	942.39	9.14	9.14	0.00
57.60	9.14	2,094,699	942.39	9.14	9.14	0.00
57.80	9.14	2,094,699	942.39	9.14	9.14	0.00
58.00	9.14	2,094,699	942.39	9.14	9.14	0.00
58.20	9.14	2,094,699	942.39	9.14	9.14	0.00
58.40	9.14	2,094,699	942.39	9.14	9.14	0.00
58.60	9.14	2,094,699	942.39	9.14	9.14	0.00
58.80	9.14	2,094,699	942.39	9.14	9.14	0.00
59.00	9.14	2,094,699	942.39	9.14	9.14	0.00
59.20	9.14	2,094,699	942.39	9.14	9.14	0.00
59.40	9.14	2,094,699	942.39	9.14	9.14	0.00
59.60	9.14	2,094,699	942.39	9.14	9.14	0.00
59.80	9.14	2,094,699	942.39	9.14	9.14	0.00
60.00	9.14	2,094,699	942.39	9.14	9.14	0.00
60.20	9.14	2,094,699	942.39	9.14	9.14	0.00
60.40	9.14	2,094,699	942.39	9.14	9.14	0.00
60.60	9.14	2,094,699	942.39	9.14	9.14	0.00
60.80	9.14	2,094,699	942.39	9.14	9.14	0.00
61.00	9.14	2,094,699	942.39	9.14	9.14	0.00
61.20	9.14	2,094,699	942.39	9.14	9.14	0.00
61.40	9.14	2,094,699	942.39	9.14	9.14	0.00
61.60	9.14	2,094,699	942.39	9.14	9.14	0.00
61.80	9.14	2,094,699	942.39	9.14	9.14	0.00
62.00	9.14	2,094,699	942.39	9.14	9.14	0.00
62.20	9.14	2,094,699	942.39	9.14	9.14	0.00

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Hydrograph for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
62.40	9.14	2,094,699	942.39	9.14	9.14	0.00
62.60	9.14	2,094,699	942.39	9.14	9.14	0.00
62.80	9.14	2,094,699	942.39	9.14	9.14	0.00
63.00	9.14	2,094,699	942.39	9.14	9.14	0.00
63.20	9.14	2,094,699	942.39	9.14	9.14	0.00
63.40	9.14	2,094,699	942.39	9.14	9.14	0.00
63.60	9.14	2,094,699	942.39	9.14	9.14	0.00
63.80	9.14	2,094,699	942.39	9.14	9.14	0.00
64.00	9.14	2,094,699	942.39	9.14	9.14	0.00
64.20	9.14	2,094,699	942.39	9.14	9.14	0.00
64.40	9.14	2,094,699	942.39	9.14	9.14	0.00
64.60	9.14	2,094,699	942.39	9.14	9.14	0.00
64.80	9.14	2,094,699	942.39	9.14	9.14	0.00
65.00	9.14	2,094,699	942.39	9.14	9.14	0.00
65.20	9.14	2,094,699	942.39	9.14	9.14	0.00
65.40	9.14	2,094,699	942.39	9.14	9.14	0.00
65.60	9.14	2,094,699	942.39	9.14	9.14	0.00
65.80	9.14	2,094,699	942.39	9.14	9.14	0.00
66.00	9.14	2,094,699	942.39	9.14	9.14	0.00
66.20	9.14	2,094,699	942.39	9.14	9.14	0.00
66.40	9.14	2,094,699	942.39	9.14	9.14	0.00
66.60	9.14	2,094,699	942.39	9.14	9.14	0.00
66.80	9.14	2,094,699	942.39	9.14	9.14	0.00
67.00	9.14	2,094,699	942.39	9.14	9.14	0.00
67.20	9.14	2,094,699	942.39	9.14	9.14	0.00
67.40	9.14	2,094,699	942.39	9.14	9.14	0.00
67.60	9.14	2,094,699	942.39	9.14	9.14	0.00
67.80	9.14	2,094,699	942.39	9.14	9.14	0.00
68.00	9.14	2,094,699	942.39	9.14	9.14	0.00
68.20	9.14	2,094,699	942.39	9.14	9.14	0.00
68.40	9.14	2,094,699	942.39	9.14	9.14	0.00
68.60	9.14	2,094,699	942.39	9.14	9.14	0.00
68.80	9.14	2,094,699	942.39	9.14	9.14	0.00
69.00	9.14	2,094,699	942.39	9.14	9.14	0.00
69.20	9.14	2,094,699	942.39	9.14	9.14	0.00
69.40	9.14	2,094,699	942.39	9.14	9.14	0.00
69.60	9.14	2,094,699	942.39	9.14	9.14	0.00
69.80	9.14	2,094,699	942.39	9.14	9.14	0.00
70.00	9.14	2,094,699	942.39	9.14	9.14	0.00
70.20	9.14	2,094,699	942.39	9.14	9.14	0.00
70.40	9.14	2,094,699	942.39	9.14	9.14	0.00
70.60	9.14	2,094,699	942.39	9.14	9.14	0.00
70.80	9.14	2,094,699	942.39	9.14	9.14	0.00
71.00	9.14	2,094,699	942.39	9.14	9.14	0.00
71.20	9.14	2,094,699	942.39	9.14	9.14	0.00
71.40	9.14	2,094,699	942.39	9.14	9.14	0.00
71.60	9.14	2,094,699	942.39	9.14	9.14	0.00
71.80	9.14	2,094,699	942.39	9.14	9.14	0.00
72.00	9.14	2,094,699	942.39	9.14	9.14	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
913.00	0.00	0.00	0.00	916.64	0.00	0.00	0.00
913.07	0.00	0.00	0.00	916.71	0.00	0.00	0.00
913.14	0.00	0.00	0.00	916.78	0.00	0.00	0.00
913.21	0.00	0.00	0.00	916.85	0.00	0.00	0.00
913.28	0.00	0.00	0.00	916.92	0.00	0.00	0.00
913.35	0.00	0.00	0.00	916.99	0.00	0.00	0.00
913.42	0.00	0.00	0.00	917.06	0.00	0.00	0.00
913.49	0.00	0.00	0.00	917.13	0.00	0.00	0.00
913.56	0.00	0.00	0.00	917.20	0.00	0.00	0.00
913.63	0.00	0.00	0.00	917.27	0.00	0.00	0.00
913.70	0.00	0.00	0.00	917.34	0.00	0.00	0.00
913.77	0.00	0.00	0.00	917.41	0.00	0.00	0.00
913.84	0.00	0.00	0.00	917.48	0.00	0.00	0.00
913.91	0.00	0.00	0.00	917.55	0.00	0.00	0.00
913.98	0.00	0.00	0.00	917.62	0.00	0.00	0.00
914.05	0.00	0.00	0.00	917.69	0.00	0.00	0.00
914.12	0.00	0.00	0.00	917.76	0.00	0.00	0.00
914.19	0.00	0.00	0.00	917.83	0.00	0.00	0.00
914.26	0.00	0.00	0.00	917.90	0.00	0.00	0.00
914.33	0.00	0.00	0.00	917.97	0.00	0.00	0.00
914.40	0.00	0.00	0.00	918.04	0.00	0.00	0.00
914.47	0.00	0.00	0.00	918.11	0.00	0.00	0.00
914.54	0.00	0.00	0.00	918.18	0.00	0.00	0.00
914.61	0.00	0.00	0.00	918.25	0.00	0.00	0.00
914.68	0.00	0.00	0.00	918.32	0.00	0.00	0.00
914.75	0.00	0.00	0.00	918.39	0.00	0.00	0.00
914.82	0.00	0.00	0.00	918.46	0.00	0.00	0.00
914.89	0.00	0.00	0.00	918.53	0.00	0.00	0.00
914.96	0.00	0.00	0.00	918.60	0.00	0.00	0.00
915.03	0.00	0.00	0.00	918.67	0.00	0.00	0.00
915.10	0.00	0.00	0.00	918.74	0.00	0.00	0.00
915.17	0.00	0.00	0.00	918.81	0.00	0.00	0.00
915.24	0.00	0.00	0.00	918.88	0.00	0.00	0.00
915.31	0.00	0.00	0.00	918.95	0.00	0.00	0.00
915.38	0.00	0.00	0.00	919.02	0.00	0.00	0.00
915.45	0.00	0.00	0.00	919.09	0.00	0.00	0.00
915.52	0.00	0.00	0.00	919.16	0.00	0.00	0.00
915.59	0.00	0.00	0.00	919.23	0.00	0.00	0.00
915.66	0.00	0.00	0.00	919.30	0.00	0.00	0.00
915.73	0.00	0.00	0.00	919.37	0.00	0.00	0.00
915.80	0.00	0.00	0.00	919.44	0.00	0.00	0.00
915.87	0.00	0.00	0.00	919.51	0.00	0.00	0.00
915.94	0.00	0.00	0.00	919.58	0.00	0.00	0.00
916.01	0.00	0.00	0.00	919.65	0.00	0.00	0.00
916.08	0.00	0.00	0.00	919.72	0.00	0.00	0.00
916.15	0.00	0.00	0.00	919.79	0.00	0.00	0.00
916.22	0.00	0.00	0.00	919.86	0.00	0.00	0.00
916.29	0.00	0.00	0.00	919.93	0.00	0.00	0.00
916.36	0.00	0.00	0.00	920.00	0.00	0.00	0.00
916.43	0.00	0.00	0.00	920.07	0.00	0.00	0.00
916.50	0.00	0.00	0.00	920.14	0.00	0.00	0.00
916.57	0.00	0.00	0.00	920.21	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
920.28	0.00	0.00	0.00	923.92	0.00	0.00	0.00
920.35	0.00	0.00	0.00	923.99	0.00	0.00	0.00
920.42	0.00	0.00	0.00	924.06	0.00	0.00	0.00
920.49	0.00	0.00	0.00	924.13	0.00	0.00	0.00
920.56	0.00	0.00	0.00	924.20	0.00	0.00	0.00
920.63	0.00	0.00	0.00	924.27	0.00	0.00	0.00
920.70	0.00	0.00	0.00	924.34	0.00	0.00	0.00
920.77	0.00	0.00	0.00	924.41	0.00	0.00	0.00
920.84	0.00	0.00	0.00	924.48	0.00	0.00	0.00
920.91	0.00	0.00	0.00	924.55	0.00	0.00	0.00
920.98	0.00	0.00	0.00	924.62	0.00	0.00	0.00
921.05	0.00	0.00	0.00	924.69	0.00	0.00	0.00
921.12	0.00	0.00	0.00	924.76	0.00	0.00	0.00
921.19	0.00	0.00	0.00	924.83	0.00	0.00	0.00
921.26	0.00	0.00	0.00	924.90	0.00	0.00	0.00
921.33	0.00	0.00	0.00	924.97	0.00	0.00	0.00
921.40	0.00	0.00	0.00	925.04	0.00	0.00	0.00
921.47	0.00	0.00	0.00	925.11	0.00	0.00	0.00
921.54	0.00	0.00	0.00	925.18	0.00	0.00	0.00
921.61	0.00	0.00	0.00	925.25	0.00	0.00	0.00
921.68	0.00	0.00	0.00	925.32	0.00	0.00	0.00
921.75	0.00	0.00	0.00	925.39	0.00	0.00	0.00
921.82	0.00	0.00	0.00	925.46	0.00	0.00	0.00
921.89	0.00	0.00	0.00	925.53	0.00	0.00	0.00
921.96	0.00	0.00	0.00	925.60	0.00	0.00	0.00
922.03	0.00	0.00	0.00	925.67	0.00	0.00	0.00
922.10	0.00	0.00	0.00	925.74	0.00	0.00	0.00
922.17	0.00	0.00	0.00	925.81	0.00	0.00	0.00
922.24	0.00	0.00	0.00	925.88	0.00	0.00	0.00
922.31	0.00	0.00	0.00	925.95	0.00	0.00	0.00
922.38	0.00	0.00	0.00	926.02	0.00	0.00	0.00
922.45	0.00	0.00	0.00	926.09	0.00	0.00	0.00
922.52	0.00	0.00	0.00	926.16	0.00	0.00	0.00
922.59	0.00	0.00	0.00	926.23	0.00	0.00	0.00
922.66	0.00	0.00	0.00	926.30	0.00	0.00	0.00
922.73	0.00	0.00	0.00	926.37	0.00	0.00	0.00
922.80	0.00	0.00	0.00	926.44	0.00	0.00	0.00
922.87	0.00	0.00	0.00	926.51	0.00	0.00	0.00
922.94	0.00	0.00	0.00	926.58	0.00	0.00	0.00
923.01	0.00	0.00	0.00	926.65	0.00	0.00	0.00
923.08	0.00	0.00	0.00	926.72	0.00	0.00	0.00
923.15	0.00	0.00	0.00	926.79	0.00	0.00	0.00
923.22	0.00	0.00	0.00	926.86	0.00	0.00	0.00
923.29	0.00	0.00	0.00	926.93	0.00	0.00	0.00
923.36	0.00	0.00	0.00	927.00	0.00	0.00	0.00
923.43	0.00	0.00	0.00	927.07	0.00	0.00	0.00
923.50	0.00	0.00	0.00	927.14	0.00	0.00	0.00
923.57	0.00	0.00	0.00	927.21	0.00	0.00	0.00
923.64	0.00	0.00	0.00	927.28	0.00	0.00	0.00
923.71	0.00	0.00	0.00	927.35	0.00	0.00	0.00
923.78	0.00	0.00	0.00	927.42	0.00	0.00	0.00
923.85	0.00	0.00	0.00	927.49	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

Prepared by URS Corp.

Printed 10/26/2012

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
927.56	0.00	0.00	0.00	931.20	0.00	0.00	0.00
927.63	0.00	0.00	0.00	931.27	0.00	0.00	0.00
927.70	0.00	0.00	0.00	931.34	0.00	0.00	0.00
927.77	0.00	0.00	0.00	931.41	0.00	0.00	0.00
927.84	0.00	0.00	0.00	931.48	0.00	0.00	0.00
927.91	0.00	0.00	0.00	931.55	0.00	0.00	0.00
927.98	0.00	0.00	0.00	931.62	0.00	0.00	0.00
928.05	0.00	0.00	0.00	931.69	0.00	0.00	0.00
928.12	0.00	0.00	0.00	931.76	0.00	0.00	0.00
928.19	0.00	0.00	0.00	931.83	0.00	0.00	0.00
928.26	0.00	0.00	0.00	931.90	0.00	0.00	0.00
928.33	0.00	0.00	0.00	931.97	0.00	0.00	0.00
928.40	0.00	0.00	0.00	932.04	0.00	0.00	0.00
928.47	0.00	0.00	0.00	932.11	0.00	0.00	0.00
928.54	0.00	0.00	0.00	932.18	0.00	0.00	0.00
928.61	0.00	0.00	0.00	932.25	0.00	0.00	0.00
928.68	0.00	0.00	0.00	932.32	0.00	0.00	0.00
928.75	0.00	0.00	0.00	932.39	0.00	0.00	0.00
928.82	0.00	0.00	0.00	932.46	0.00	0.00	0.00
928.89	0.00	0.00	0.00	932.53	0.00	0.00	0.00
928.96	0.00	0.00	0.00	932.60	0.00	0.00	0.00
929.03	0.00	0.00	0.00	932.67	0.00	0.00	0.00
929.10	0.00	0.00	0.00	932.74	0.00	0.00	0.00
929.17	0.00	0.00	0.00	932.81	0.00	0.00	0.00
929.24	0.00	0.00	0.00	932.88	0.00	0.00	0.00
929.31	0.00	0.00	0.00	932.95	0.00	0.00	0.00
929.38	0.00	0.00	0.00	933.02	0.00	0.00	0.00
929.45	0.00	0.00	0.00	933.09	0.00	0.00	0.00
929.52	0.00	0.00	0.00	933.16	0.00	0.00	0.00
929.59	0.00	0.00	0.00	933.23	0.00	0.00	0.00
929.66	0.00	0.00	0.00	933.30	0.00	0.00	0.00
929.73	0.00	0.00	0.00	933.37	0.00	0.00	0.00
929.80	0.00	0.00	0.00	933.44	0.00	0.00	0.00
929.87	0.00	0.00	0.00	933.51	0.00	0.00	0.00
929.94	0.00	0.00	0.00	933.58	0.00	0.00	0.00
930.01	0.00	0.00	0.00	933.65	0.00	0.00	0.00
930.08	0.00	0.00	0.00	933.72	0.00	0.00	0.00
930.15	0.00	0.00	0.00	933.79	0.00	0.00	0.00
930.22	0.00	0.00	0.00	933.86	0.00	0.00	0.00
930.29	0.00	0.00	0.00	933.93	0.00	0.00	0.00
930.36	0.00	0.00	0.00	934.00	0.00	0.00	0.00
930.43	0.00	0.00	0.00	934.07	0.00	0.00	0.00
930.50	0.00	0.00	0.00	934.14	0.00	0.00	0.00
930.57	0.00	0.00	0.00	934.21	0.00	0.00	0.00
930.64	0.00	0.00	0.00	934.28	0.00	0.00	0.00
930.71	0.00	0.00	0.00	934.35	0.00	0.00	0.00
930.78	0.00	0.00	0.00	934.42	0.00	0.00	0.00
930.85	0.00	0.00	0.00	934.49	0.00	0.00	0.00
930.92	0.00	0.00	0.00	934.56	0.00	0.00	0.00
930.99	0.00	0.00	0.00	934.63	0.00	0.00	0.00
931.06	0.00	0.00	0.00	934.70	0.00	0.00	0.00
931.13	0.00	0.00	0.00	934.77	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"

Prepared by URS Corp.

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Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
934.84	0.00	0.00	0.00	938.48	0.00	0.00	0.00
934.91	0.00	0.00	0.00	938.55	0.00	0.00	0.00
934.98	0.00	0.00	0.00	938.62	0.00	0.00	0.00
935.05	0.00	0.00	0.00	938.69	0.00	0.00	0.00
935.12	0.00	0.00	0.00	938.76	0.00	0.00	0.00
935.19	0.00	0.00	0.00	938.83	0.00	0.00	0.00
935.26	0.00	0.00	0.00	938.90	0.00	0.00	0.00
935.33	0.00	0.00	0.00	938.97	0.00	0.00	0.00
935.40	0.00	0.00	0.00	939.04	0.00	0.00	0.00
935.47	0.00	0.00	0.00	939.11	0.00	0.00	0.00
935.54	0.00	0.00	0.00	939.18	0.00	0.00	0.00
935.61	0.00	0.00	0.00	939.25	0.00	0.00	0.00
935.68	0.00	0.00	0.00	939.32	0.00	0.00	0.00
935.75	0.00	0.00	0.00	939.39	0.00	0.00	0.00
935.82	0.00	0.00	0.00	939.46	0.00	0.00	0.00
935.89	0.00	0.00	0.00	939.53	0.00	0.00	0.00
935.96	0.00	0.00	0.00	939.60	0.00	0.00	0.00
936.03	0.00	0.00	0.00	939.67	0.00	0.00	0.00
936.10	0.00	0.00	0.00	939.74	0.00	0.00	0.00
936.17	0.00	0.00	0.00	939.81	0.00	0.00	0.00
936.24	0.00	0.00	0.00	939.88	0.00	0.00	0.00
936.31	0.00	0.00	0.00	939.95	0.00	0.00	0.00
936.38	0.00	0.00	0.00	940.02	0.00	0.00	0.00
936.45	0.00	0.00	0.00	940.09	0.00	0.00	0.00
936.52	0.00	0.00	0.00	940.16	0.00	0.00	0.00
936.59	0.00	0.00	0.00	940.23	0.00	0.00	0.00
936.66	0.00	0.00	0.00	940.30	0.00	0.00	0.00
936.73	0.00	0.00	0.00	940.37	0.00	0.00	0.00
936.80	0.00	0.00	0.00	940.44	0.00	0.00	0.00
936.87	0.00	0.00	0.00	940.51	0.00	0.00	0.00
936.94	0.00	0.00	0.00	940.58	0.00	0.00	0.00
937.01	0.00	0.00	0.00	940.65	0.00	0.00	0.00
937.08	0.00	0.00	0.00	940.72	0.00	0.00	0.00
937.15	0.00	0.00	0.00	940.79	0.00	0.00	0.00
937.22	0.00	0.00	0.00	940.86	0.00	0.00	0.00
937.29	0.00	0.00	0.00	940.93	0.00	0.00	0.00
937.36	0.00	0.00	0.00	941.00	0.00	0.00	0.00
937.43	0.00	0.00	0.00	941.07	0.00	0.00	0.00
937.50	0.00	0.00	0.00	941.14	0.00	0.00	0.00
937.57	0.00	0.00	0.00	941.21	0.00	0.00	0.00
937.64	0.00	0.00	0.00	941.28	0.00	0.00	0.00
937.71	0.00	0.00	0.00	941.35	0.00	0.00	0.00
937.78	0.00	0.00	0.00	941.42	0.00	0.00	0.00
937.85	0.00	0.00	0.00	941.49	0.01	0.01	0.00
937.92	0.00	0.00	0.00	941.56	0.13	0.13	0.00
937.99	0.00	0.00	0.00	941.63	0.39	0.39	0.00
938.06	0.00	0.00	0.00	941.70	0.80	0.80	0.00
938.13	0.00	0.00	0.00	941.77	1.36	1.36	0.00
938.20	0.00	0.00	0.00	941.84	2.06	2.06	0.00
938.27	0.00	0.00	0.00	941.91	2.86	2.86	0.00
938.34	0.00	0.00	0.00	941.98	3.74	3.74	0.00
938.41	0.00	0.00	0.00	942.05	4.67	4.67	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
942.12	5.58	5.58	0.00	945.76	2,435.03	35.56	2,399.46
942.19	6.46	6.46	0.00	945.83	2,513.07	35.91	2,477.16
942.26	7.39	7.39	0.00	945.90	2,591.93	36.25	2,555.68
942.33	8.33	8.33	0.00	945.97	2,671.59	36.59	2,635.01
942.40	9.29	9.29	0.00				
942.47	10.26	10.26	0.00				
942.54	14.56	11.23	3.32				
942.61	27.37	12.21	15.15				
942.68	44.90	13.18	31.72				
942.75	66.15	14.13	52.02				
942.82	90.58	15.05	75.53				
942.89	117.80	15.91	101.89				
942.96	147.25	16.68	130.57				
943.03	178.90	17.43	161.48				
943.10	212.61	18.11	194.50				
943.17	246.49	18.76	227.73				
943.24	281.67	19.41	262.26				
943.31	318.29	20.04	298.25				
943.38	357.94	20.65	337.29				
943.45	399.06	21.24	377.82				
943.52	441.92	21.82	420.10				
943.59	487.07	22.38	464.70				
943.66	533.77	22.92	510.85				
943.73	581.66	23.46	558.20				
943.80	630.50	23.98	606.53				
943.87	680.66	24.49	656.17				
943.94	731.55	24.99	706.56				
944.01	783.17	25.47	757.70				
944.08	835.87	25.95	809.91				
944.15	890.42	26.43	864.00				
944.22	946.45	26.89	919.56				
944.29	1,003.61	27.34	976.26				
944.36	1,061.88	27.79	1,034.09				
944.43	1,121.24	28.23	1,093.01				
944.50	1,181.67	28.66	1,153.01				
944.57	1,243.16	29.09	1,214.07				
944.64	1,305.68	29.51	1,276.17				
944.71	1,369.22	29.92	1,339.29				
944.78	1,433.76	30.33	1,403.43				
944.85	1,499.29	30.74	1,468.55				
944.92	1,565.79	31.13	1,534.65				
944.99	1,633.25	31.53	1,601.72				
945.06	1,701.65	31.92	1,669.73				
945.13	1,770.99	32.30	1,738.69				
945.20	1,841.24	32.68	1,808.56				
945.27	1,912.40	33.05	1,879.35				
945.34	1,984.46	33.42	1,951.03				
945.41	2,057.40	33.79	2,023.61				
945.48	2,131.22	34.15	2,097.06				
945.55	2,205.90	34.51	2,171.39				
945.62	2,281.43	34.87	2,246.57				
945.69	2,357.81	35.22	2,322.59				

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
913.00	0	916.64	72,128	920.28	208,068
913.07	589	916.71	74,218	920.35	211,226
913.14	1,179	916.78	76,309	920.42	214,383
913.21	1,768	916.85	78,399	920.49	217,541
913.28	2,358	916.92	80,490	920.56	220,699
913.35	2,947	916.99	82,580	920.63	223,856
913.42	3,537	917.06	84,901	920.70	227,014
913.49	4,126	917.13	87,260	920.77	230,172
913.56	4,716	917.20	89,620	920.84	233,329
913.63	5,305	917.27	91,979	920.91	236,487
913.70	5,895	917.34	94,338	920.98	239,645
913.77	6,484	917.41	96,697	921.05	243,000
913.84	7,074	917.48	99,056	921.12	246,434
913.91	7,663	917.55	101,416	921.19	249,867
913.98	8,253	917.62	103,775	921.26	253,301
914.05	9,380	917.69	106,134	921.33	256,735
914.12	10,722	917.76	108,493	921.40	260,169
914.19	12,064	917.83	110,852	921.47	263,603
914.26	13,407	917.90	113,212	921.54	267,037
914.33	14,749	917.97	115,571	921.61	270,471
914.40	16,091	918.04	118,085	921.68	273,904
914.47	17,434	918.11	120,714	921.75	277,338
914.54	18,776	918.18	123,344	921.82	280,772
914.61	20,118	918.25	125,974	921.89	284,206
914.68	21,461	918.32	128,604	921.96	287,640
914.75	22,803	918.39	131,234	922.03	291,183
914.82	24,145	918.46	133,863	922.10	294,872
914.89	25,488	918.53	136,493	922.17	298,560
914.96	26,830	918.60	139,123	922.24	302,249
915.03	28,360	918.67	141,753	922.31	305,938
915.10	30,139	918.74	144,382	922.38	309,627
915.17	31,918	918.81	147,012	922.45	313,316
915.24	33,697	918.88	149,642	922.52	317,004
915.31	35,476	918.95	152,272	922.59	320,693
915.38	37,255	919.02	154,976	922.66	324,382
915.45	39,035	919.09	157,866	922.73	328,071
915.52	40,814	919.16	160,756	922.80	331,760
915.59	42,593	919.23	163,646	922.87	335,448
915.66	44,372	919.30	166,536	922.94	339,137
915.73	46,151	919.37	169,426	923.01	342,861
915.80	47,931	919.44	172,316	923.08	346,792
915.87	49,710	919.51	175,206	923.15	350,724
915.94	51,489	919.58	178,096	923.22	354,655
916.01	53,313	919.65	180,987	923.29	358,587
916.08	55,403	919.72	183,877	923.36	362,518
916.15	57,494	919.79	186,767	923.43	366,450
916.22	59,584	919.86	189,657	923.50	370,382
916.29	61,675	919.93	192,547	923.57	374,313
916.36	63,765	920.00	195,437	923.64	378,245
916.43	65,856	920.07	198,595	923.71	382,176
916.50	67,947	920.14	201,752	923.78	386,108
916.57	70,037	920.21	204,910	923.85	390,039

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
923.92	393,971	927.56	632,050	931.20	928,024
923.99	397,902	927.63	637,182	931.27	934,308
924.06	402,059	927.70	642,314	931.34	940,591
924.13	406,252	927.77	647,446	931.41	946,874
924.20	410,446	927.84	652,578	931.48	953,158
924.27	414,640	927.91	657,710	931.55	959,441
924.34	418,833	927.98	662,842	931.62	965,724
924.41	423,027	928.05	668,198	931.69	972,008
924.48	427,221	928.12	673,644	931.76	978,291
924.55	431,414	928.19	679,090	931.83	984,574
924.62	435,608	928.26	684,536	931.90	990,858
924.69	439,802	928.33	689,982	931.97	997,141
924.76	443,996	928.40	695,428	932.04	1,003,560
924.83	448,189	928.47	700,874	932.11	1,010,081
924.90	452,383	928.54	706,321	932.18	1,016,602
924.97	456,577	928.61	711,767	932.25	1,023,123
925.04	460,936	928.68	717,213	932.32	1,029,644
925.11	465,419	928.75	722,659	932.39	1,036,165
925.18	469,903	928.82	728,105	932.46	1,042,686
925.25	474,386	928.89	733,551	932.53	1,049,207
925.32	478,869	928.96	738,997	932.60	1,055,728
925.39	483,353	929.03	744,568	932.67	1,062,249
925.46	487,836	929.10	750,307	932.74	1,068,769
925.53	492,319	929.17	756,046	932.81	1,075,390
925.60	496,803	929.24	761,784	932.88	1,082,028
925.67	501,286	929.31	767,523	932.95	1,088,666
925.74	505,770	929.38	773,261	933.02	1,095,311
925.81	510,253	929.45	779,000	933.09	1,101,976
925.88	514,736	929.52	784,739	933.16	1,108,641
925.95	519,220	929.59	790,477	933.23	1,115,305
926.02	523,793	929.66	796,216	933.30	1,121,970
926.09	528,593	929.73	801,954	933.37	1,128,635
926.16	533,394	929.80	807,693	933.44	1,135,349
926.23	538,194	929.87	813,432	933.51	1,142,101
926.30	542,994	929.94	819,170	933.58	1,148,854
926.37	547,794	930.01	824,949	933.65	1,155,606
926.44	552,594	930.08	830,968	933.72	1,162,358
926.51	557,394	930.15	836,986	933.79	1,169,110
926.58	562,194	930.22	843,005	933.86	1,175,862
926.65	566,994	930.29	849,024	933.93	1,182,614
926.72	571,794	930.36	855,043	934.00	1,189,366
926.79	576,594	930.43	861,062	934.07	1,196,253
926.86	581,394	930.50	867,081	934.14	1,203,141
926.93	586,194	930.57	873,099	934.21	1,210,028
927.00	590,994	930.64	879,118	934.28	1,216,915
927.07	596,126	930.71	885,137	934.35	1,223,803
927.14	601,258	930.78	891,156	934.42	1,230,690
927.21	606,390	930.85	897,175	934.49	1,237,578
927.28	611,522	930.92	903,193	934.56	1,244,465
927.35	616,654	930.99	909,212	934.63	1,251,352
927.42	621,786	931.06	915,458	934.70	1,258,240
927.49	626,918	931.13	921,741	934.77	1,265,127

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"
Printed 10/26/2012

Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
934.84	1,272,014	938.48	1,650,329	942.12	2,062,231
934.91	1,278,902	938.55	1,658,005	942.19	2,070,676
934.98	1,285,789	938.62	1,665,682	942.26	2,079,121
935.05	1,292,798	938.69	1,673,358	942.33	2,087,567
935.12	1,299,855	938.76	1,681,034	942.40	2,096,012
935.19	1,306,912	938.83	1,688,710	942.47	2,104,457
935.26	1,313,969	938.90	1,696,386	942.54	2,112,903
935.33	1,321,027	938.97	1,704,062	942.61	2,121,348
935.40	1,328,084	939.04	1,711,738	942.68	2,129,794
935.47	1,335,141	939.11	1,719,414	942.75	2,138,239
935.54	1,342,198	939.18	1,727,091	942.82	2,146,684
935.61	1,349,255	939.25	1,734,767	942.89	2,155,130
935.68	1,356,313	939.32	1,742,443	942.96	2,163,575
935.75	1,363,370	939.39	1,750,119	943.03	2,172,020
935.82	1,370,427	939.46	1,757,795	943.10	2,180,466
935.89	1,377,484	939.53	1,765,471	943.17	2,188,911
935.96	1,384,541	939.60	1,773,147	943.24	2,197,356
936.03	1,391,673	939.67	1,780,824	943.31	2,205,802
936.10	1,398,904	939.74	1,788,500	943.38	2,214,247
936.17	1,406,134	939.81	1,796,176	943.45	2,222,693
936.24	1,413,365	939.88	1,803,852	943.52	2,231,138
936.31	1,420,596	939.95	1,811,528	943.59	2,239,583
936.38	1,427,827	940.02	1,819,296	943.66	2,248,029
936.45	1,435,058	940.09	1,827,294	943.73	2,256,474
936.52	1,442,288	940.16	1,835,291	943.80	2,264,919
936.59	1,449,519	940.23	1,843,289	943.87	2,273,365
936.66	1,456,750	940.30	1,851,286	943.94	2,281,810
936.73	1,463,981	940.37	1,859,284	944.01	2,290,255
936.80	1,471,212	940.44	1,867,282	944.08	2,298,701
936.87	1,478,442	940.51	1,875,279	944.15	2,307,146
936.94	1,485,673	940.58	1,883,277	944.22	2,315,592
937.01	1,492,929	940.65	1,891,274	944.29	2,324,037
937.08	1,500,337	940.72	1,899,272	944.36	2,332,482
937.15	1,507,744	940.79	1,907,270	944.43	2,340,928
937.22	1,515,152	940.86	1,915,267	944.50	2,349,373
937.29	1,522,559	940.93	1,923,265	944.57	2,357,818
937.36	1,529,967	941.00	1,931,263	944.64	2,366,264
937.43	1,537,374	941.07	1,939,260	944.71	2,374,709
937.50	1,544,782	941.14	1,947,258	944.78	2,383,154
937.57	1,552,190	941.21	1,955,255	944.85	2,391,600
937.64	1,559,597	941.28	1,963,253	944.92	2,400,045
937.71	1,567,005	941.35	1,971,251	944.99	2,408,491
937.78	1,574,412	941.42	1,979,248	945.06	2,417,240
937.85	1,581,820	941.49	1,987,246	945.13	2,426,040
937.92	1,589,227	941.56	1,995,243	945.20	2,434,840
937.99	1,596,635	941.63	2,003,241	945.27	2,443,640
938.06	1,604,273	941.70	2,011,558	945.34	2,452,440
938.13	1,611,949	941.77	2,020,004	945.41	2,461,240
938.20	1,619,625	941.84	2,028,449	945.48	2,470,040
938.27	1,627,301	941.91	2,036,894	945.55	2,478,840
938.34	1,634,977	941.98	2,045,340	945.62	2,487,640
938.41	1,642,653	942.05	2,053,785	945.69	2,496,440

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Area-Storage for Pond Pond 2: Pond 2 (Starting W.S.E. 932.50) (continued)

Elevation (feet)	Storage (cubic-feet)
945.76	2,505,240
945.83	2,514,040
945.90	2,522,840
945.97	2,531,640

Pond 2 & 3 Model_Proposed Conditions

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Summary for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Inflow Area = 190.490 ac, 20.07% Impervious, Inflow Depth > 5.09" for 10-yr event
Inflow = 612.18 cfs @ 12.16 hrs, Volume= 80.867 af
Outflow = 29.94 cfs @ 16.00 hrs, Volume= 60.240 af, Atten= 95%, Lag= 230.6 min
Primary = 21.08 cfs @ 16.00 hrs, Volume= 57.967 af
Secondary = 8.85 cfs @ 16.00 hrs, Volume= 2.273 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 931.59' Surf.Area= 0 sf Storage= 734,265 cf

Peak Elev= 942.62' @ 16.00 hrs Surf.Area= 0 sf Storage= 1,786,750 cf (1,052,485 cf above start)

Plug-Flow detention time= 1,751.7 min calculated for 43.384 af (54% of inflow)

Center-of-Mass det. time= 409.4 min (2,213.4 - 1,804.1)

Volume Invert Avail.Storage Storage Description

#1	911.00'	2,216,035 cf	Custom Stage Data Listed below
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Elevation (feet)	Cum.Store (cubic-feet)
---------------------	---------------------------

911.00	0
912.00	3,255
913.00	10,425
914.00	21,229
915.00	34,742
916.00	51,377
917.00	71,289
918.00	93,943
919.00	119,149
920.00	147,026
921.00	177,524
922.00	210,420
923.00	245,859
924.00	284,504
925.00	328,343
926.00	377,769
927.00	431,484
928.00	489,347
929.00	551,533
930.00	618,443
931.00	690,059
931.80	749,999
932.00	765,242
933.00	842,526
934.00	921,581
935.00	1,002,437
936.00	1,085,292
940.00	1,474,890
941.00	1,588,661
944.00	1,954,424
945.00	2,083,402
946.00	2,216,035

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	931.59'	8.0" Round 8" Culvert L= 98.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 931.59' / 924.79' S= 0.0692 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	931.78'	8.0" Round 8" Culvert L= 120.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 931.78' / 908.82' S= 0.1913 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Primary	940.93'	18.0" Round 18" Culvert L= 40.7' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 940.93' / 940.27' S= 0.0162 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#4	Primary	941.10'	18.0" Round 18" Culvert L= 40.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.10' / 940.25' S= 0.0210 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#5	Secondary	942.50'	75.0' long x 40.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.08 cfs @ 16.00 hrs HW=942.62' (Free Discharge)

1=8" Culvert (Inlet Controls 4.34 cfs @ 12.44 fps)

2=8" Culvert (Inlet Controls 4.30 cfs @ 12.32 fps)

3=18" Culvert (Inlet Controls 6.53 cfs @ 3.69 fps)

4=18" Culvert (Inlet Controls 5.91 cfs @ 3.35 fps)

Secondary OutFlow Max=8.85 cfs @ 16.00 hrs HW=942.62' (Free Discharge)

5=Broad-Crested Rectangular Weir (Weir Controls 8.85 cfs @ 0.95 fps)

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	734,265	931.59	0.00	0.00	0.00
0.20	0.00	734,265	931.59	0.00	0.00	0.00
0.40	0.00	734,265	931.59	0.00	0.00	0.00
0.60	0.00	734,265	931.59	0.00	0.00	0.00
0.80	0.00	734,265	931.59	0.00	0.00	0.00
1.00	0.00	734,265	931.59	0.00	0.00	0.00
1.20	0.00	734,265	931.59	0.00	0.00	0.00
1.40	0.00	734,265	931.59	0.00	0.00	0.00
1.60	0.00	734,265	931.59	0.00	0.00	0.00
1.80	0.00	734,265	931.59	0.00	0.00	0.00
2.00	0.00	734,265	931.59	0.00	0.00	0.00
2.20	0.00	734,265	931.59	0.00	0.00	0.00
2.40	0.00	734,265	931.59	0.00	0.00	0.00
2.60	0.00	734,265	931.59	0.00	0.00	0.00
2.80	0.00	734,265	931.59	0.00	0.00	0.00
3.00	0.00	734,265	931.59	0.00	0.00	0.00
3.20	0.00	734,265	931.59	0.00	0.00	0.00
3.40	0.00	734,265	931.59	0.00	0.00	0.00
3.60	0.00	734,265	931.59	0.00	0.00	0.00
3.80	0.00	734,265	931.59	0.00	0.00	0.00
4.00	0.00	734,265	931.59	0.00	0.00	0.00
4.20	0.00	734,265	931.59	0.00	0.00	0.00
4.40	0.00	734,265	931.59	0.00	0.00	0.00
4.60	0.00	734,265	931.59	0.00	0.00	0.00
4.80	0.00	734,265	931.59	0.00	0.00	0.00
5.00	0.00	734,265	931.59	0.00	0.00	0.00
5.20	0.00	734,265	931.59	0.00	0.00	0.00
5.40	0.00	734,265	931.59	0.00	0.00	0.00
5.60	0.00	734,265	931.59	0.00	0.00	0.00
5.80	0.00	734,265	931.59	0.00	0.00	0.00
6.00	0.00	734,265	931.59	0.00	0.00	0.00
6.20	0.00	734,265	931.59	0.00	0.00	0.00
6.40	0.00	734,265	931.59	0.00	0.00	0.00
6.60	0.00	734,265	931.59	0.00	0.00	0.00
6.80	0.00	734,265	931.59	0.00	0.00	0.00
7.00	0.00	734,265	931.59	0.00	0.00	0.00
7.20	0.00	734,265	931.59	0.00	0.00	0.00
7.40	0.00	734,265	931.59	0.00	0.00	0.00
7.60	0.00	734,265	931.59	0.00	0.00	0.00
7.80	0.00	734,265	931.59	0.00	0.00	0.00
8.00	0.00	734,265	931.59	0.00	0.00	0.00
8.20	0.00	734,265	931.59	0.00	0.00	0.00
8.40	0.00	734,265	931.59	0.00	0.00	0.00
8.60	0.00	734,265	931.59	0.00	0.00	0.00
8.80	0.00	734,265	931.59	0.00	0.00	0.00
9.00	0.00	734,265	931.59	0.00	0.00	0.00
9.20	0.00	734,265	931.59	0.00	0.00	0.00
9.40	0.00	734,265	931.59	0.00	0.00	0.00
9.60	0.00	734,265	931.59	0.00	0.00	0.00
9.80	0.00	734,265	931.59	0.00	0.00	0.00
10.00	0.00	734,265	931.59	0.00	0.00	0.00
10.20	0.00	734,265	931.59	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
10.40	0.00	734,265	931.59	0.00	0.00	0.00
10.60	0.00	734,265	931.59	0.00	0.00	0.00
10.80	0.00	734,265	931.59	0.00	0.00	0.00
11.00	0.00	734,265	931.59	0.00	0.00	0.00
11.20	0.00	734,265	931.59	0.00	0.00	0.00
11.40	0.00	734,265	931.59	0.00	0.00	0.00
11.60	0.00	734,265	931.59	0.00	0.00	0.00
11.80	0.00	734,265	931.59	0.00	0.00	0.00
12.00	1.66	734,304	931.59	0.00	0.00	0.00
12.20	563.84	1,000,110	934.97	4.56	4.56	0.00
12.40	241.71	1,268,866	937.88	6.43	6.43	0.00
12.60	133.73	1,392,247	939.15	7.09	7.09	0.00
12.80	91.07	1,465,745	939.91	7.45	7.45	0.00
13.00	74.21	1,518,965	940.39	7.68	7.68	0.00
13.20	64.65	1,563,167	940.78	7.85	7.85	0.00
13.40	58.06	1,601,460	941.10	8.14	8.14	0.00
13.60	53.12	1,635,242	941.38	9.26	9.26	0.00
13.80	48.78	1,664,603	941.62	11.08	11.08	0.00
14.00	45.05	1,689,640	941.83	13.10	13.10	0.00
14.20	41.82	1,710,776	942.00	14.97	14.97	0.00
14.40	39.11	1,728,462	942.15	16.62	16.62	0.00
14.60	37.49	1,743,526	942.27	17.98	17.98	0.00
14.80	36.25	1,756,710	942.38	19.07	19.07	0.00
15.00	35.07	1,768,348	942.47	19.91	19.91	0.00
15.20	32.77	1,777,810	942.55	22.89	20.55	2.34
15.40	31.37	1,782,886	942.59	26.55	20.85	5.70
15.60	30.96	1,785,354	942.61	28.66	21.00	7.66
15.80	30.55	1,786,457	942.62	29.67	21.07	8.60
16.00	29.94	1,786,750	942.62	29.94	21.08	8.85
16.20	29.19	1,786,533	942.62	29.74	21.07	8.67
16.40	28.58	1,786,058	942.62	29.30	21.04	8.26
16.60	28.11	1,785,540	942.61	28.83	21.01	7.82
16.80	27.69	1,785,035	942.61	28.38	20.98	7.40
17.00	27.27	1,784,545	942.61	27.95	20.94	7.00
17.20	26.86	1,784,061	942.60	27.53	20.91	6.61
17.40	26.45	1,783,579	942.60	27.12	20.89	6.24
17.60	26.04	1,783,093	942.59	26.72	20.86	5.86
17.80	25.64	1,782,601	942.59	26.32	20.83	5.49
18.00	25.23	1,782,102	942.59	25.93	20.81	5.12
18.20	24.82	1,781,594	942.58	25.54	20.78	4.76
18.40	24.42	1,781,076	942.58	25.14	20.75	4.40
18.60	24.01	1,780,547	942.57	24.75	20.72	4.03
18.80	23.60	1,780,006	942.57	24.36	20.68	3.68
19.00	23.19	1,779,451	942.56	23.97	20.65	3.32
19.20	22.78	1,778,880	942.56	23.58	20.62	2.97
19.40	22.37	1,778,293	942.56	23.20	20.58	2.62
19.60	21.96	1,777,686	942.55	22.82	20.54	2.27
19.80	21.55	1,777,058	942.55	22.44	20.50	1.93
20.00	21.13	1,776,404	942.54	22.06	20.46	1.60
20.20	20.73	1,775,722	942.53	21.69	20.42	1.28
20.40	20.44	1,775,041	942.53	21.35	20.37	0.98
20.60	20.25	1,774,423	942.52	21.06	20.33	0.73

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
20.80	20.12	1,773,878	942.52	20.83	20.29	0.53
21.00	20.00	1,773,386	942.52	20.65	20.26	0.39
21.20	19.89	1,772,937	942.51	20.49	20.23	0.26
21.40	19.79	1,772,520	942.51	20.36	20.20	0.16
21.60	19.69	1,772,119	942.50	20.25	20.17	0.07
21.80	19.60	1,771,719	942.50	20.16	20.15	0.01
22.00	19.48	1,771,292	942.50	20.11	20.11	0.00
22.20	19.41	1,770,825	942.49	20.08	20.08	0.00
22.40	19.33	1,770,331	942.49	20.04	20.04	0.00
22.60	19.25	1,769,810	942.49	20.01	20.01	0.00
22.80	19.17	1,769,249	942.48	19.97	19.97	0.00
23.00	19.10	1,768,661	942.48	19.93	19.93	0.00
23.20	19.02	1,768,048	942.47	19.89	19.89	0.00
23.40	18.94	1,767,410	942.47	19.84	19.84	0.00
23.60	18.86	1,766,749	942.46	19.79	19.79	0.00
23.80	18.78	1,766,066	942.46	19.74	19.74	0.00
24.00	18.70	1,765,362	942.45	19.69	19.69	0.00
24.20	17.45	1,764,460	942.44	19.62	19.62	0.00
24.40	13.28	1,761,399	942.42	19.41	19.41	0.00
24.60	11.19	1,756,239	942.37	19.04	19.04	0.00
24.80	10.41	1,750,428	942.33	18.57	18.57	0.00
25.00	10.10	1,744,599	942.28	18.08	18.08	0.00
25.20	9.95	1,738,975	942.23	17.58	17.58	0.00
25.40	9.87	1,733,627	942.19	17.09	17.09	0.00
25.60	9.82	1,728,575	942.15	16.63	16.63	0.00
25.80	9.78	1,723,812	942.11	16.20	16.20	0.00
26.00	9.75	1,719,331	942.07	15.77	15.77	0.00
26.20	9.73	1,715,133	942.04	15.38	15.38	0.00
26.40	9.72	1,711,197	942.01	15.01	15.01	0.00
26.60	9.74	1,707,514	941.97	14.67	14.67	0.00
26.80	9.75	1,704,079	941.95	14.36	14.36	0.00
27.00	9.76	1,700,871	941.92	14.07	14.07	0.00
27.20	9.84	1,697,896	941.90	13.80	13.80	0.00
27.40	9.87	1,695,148	941.87	13.56	13.56	0.00
27.60	9.87	1,692,576	941.85	13.33	13.33	0.00
27.80	9.88	1,690,163	941.83	13.12	13.12	0.00
28.00	9.88	1,687,889	941.81	12.94	12.94	0.00
28.20	9.87	1,685,754	941.80	12.75	12.75	0.00
28.40	9.86	1,683,740	941.78	12.58	12.58	0.00
28.60	9.85	1,681,840	941.76	12.42	12.42	0.00
28.80	9.84	1,680,040	941.75	12.27	12.27	0.00
29.00	9.82	1,678,333	941.74	12.13	12.13	0.00
29.20	9.80	1,676,711	941.72	12.00	12.00	0.00
29.40	9.79	1,675,168	941.71	11.88	11.88	0.00
29.60	9.77	1,673,698	941.70	11.76	11.76	0.00
29.80	9.75	1,672,297	941.69	11.65	11.65	0.00
30.00	9.73	1,670,960	941.68	11.55	11.55	0.00
30.20	9.72	1,669,681	941.66	11.45	11.45	0.00
30.40	9.69	1,668,457	941.65	11.36	11.36	0.00
30.60	9.66	1,667,278	941.64	11.27	11.27	0.00
30.80	9.63	1,666,140	941.64	11.19	11.19	0.00
31.00	9.60	1,665,038	941.63	11.11	11.11	0.00

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
31.20	9.57	1,663,970	941.62	11.03	11.03	0.00
31.40	9.53	1,662,933	941.61	10.95	10.95	0.00
31.60	9.50	1,661,924	941.60	10.88	10.88	0.00
31.80	9.47	1,660,945	941.59	10.81	10.81	0.00
32.00	9.45	1,659,995	941.59	10.75	10.75	0.00
32.20	9.42	1,659,073	941.58	10.68	10.68	0.00
32.40	9.40	1,658,180	941.57	10.62	10.62	0.00
32.60	9.38	1,657,314	941.56	10.56	10.56	0.00
32.80	9.36	1,656,475	941.56	10.51	10.51	0.00
33.00	9.34	1,655,663	941.55	10.45	10.45	0.00
33.20	9.33	1,654,878	941.54	10.40	10.40	0.00
33.40	9.31	1,654,117	941.54	10.35	10.35	0.00
33.60	9.30	1,653,382	941.53	10.30	10.30	0.00
33.80	9.29	1,652,671	941.53	10.26	10.26	0.00
34.00	9.27	1,651,983	941.52	10.21	10.21	0.00
34.20	9.26	1,651,318	941.51	10.17	10.17	0.00
34.40	9.25	1,650,676	941.51	10.13	10.13	0.00
34.60	9.25	1,650,056	941.50	10.09	10.09	0.00
34.80	9.24	1,649,456	941.50	10.05	10.05	0.00
35.00	9.23	1,648,877	941.49	10.02	10.02	0.00
35.20	9.22	1,648,318	941.49	9.99	9.99	0.00
35.40	9.22	1,647,778	941.48	9.95	9.95	0.00
35.60	9.21	1,647,256	941.48	9.92	9.92	0.00
35.80	9.20	1,646,753	941.48	9.89	9.89	0.00
36.00	9.20	1,646,267	941.47	9.86	9.86	0.00
36.20	9.19	1,645,798	941.47	9.83	9.83	0.00
36.40	9.19	1,645,345	941.46	9.81	9.81	0.00
36.60	9.19	1,644,908	941.46	9.78	9.78	0.00
36.80	9.18	1,644,478	941.46	9.77	9.77	0.00
37.00	9.18	1,644,063	941.45	9.74	9.74	0.00
37.20	9.18	1,643,667	941.45	9.71	9.71	0.00
37.40	9.17	1,643,288	941.45	9.69	9.69	0.00
37.60	9.17	1,642,916	941.45	9.68	9.68	0.00
37.80	9.17	1,642,554	941.44	9.65	9.65	0.00
38.00	9.17	1,642,215	941.44	9.63	9.63	0.00
38.20	9.16	1,641,887	941.44	9.61	9.61	0.00
38.40	9.16	1,641,571	941.43	9.59	9.59	0.00
38.60	9.16	1,641,266	941.43	9.58	9.58	0.00
38.80	9.16	1,640,972	941.43	9.56	9.56	0.00
39.00	9.16	1,640,687	941.43	9.54	9.54	0.00
39.20	9.16	1,640,413	941.42	9.53	9.53	0.00
39.40	9.15	1,640,149	941.42	9.52	9.52	0.00
39.60	9.15	1,639,893	941.42	9.50	9.50	0.00
39.80	9.15	1,639,647	941.42	9.49	9.49	0.00
40.00	9.15	1,639,409	941.42	9.48	9.48	0.00
40.20	9.15	1,639,180	941.41	9.46	9.46	0.00
40.40	9.15	1,638,959	941.41	9.45	9.45	0.00
40.60	9.15	1,638,745	941.41	9.44	9.44	0.00
40.80	9.15	1,638,539	941.41	9.43	9.43	0.00
41.00	9.15	1,638,340	941.41	9.42	9.42	0.00
41.20	9.15	1,638,148	941.41	9.41	9.41	0.00
41.40	9.15	1,637,963	941.40	9.40	9.40	0.00

Pond 2 & 3 Model_Proposed Conditions

Type II 24-hr 10-yr Rainfall=4.80"
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Printed 10/26/2012

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Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
41.60	9.15	1,637,784	941.40	9.39	9.39	0.00
41.80	9.15	1,637,611	941.40	9.38	9.38	0.00
42.00	9.14	1,637,445	941.40	9.37	9.37	0.00
42.20	9.14	1,637,284	941.40	9.36	9.36	0.00
42.40	9.14	1,637,129	941.40	9.36	9.36	0.00
42.60	9.14	1,636,979	941.40	9.35	9.35	0.00
42.80	9.14	1,636,834	941.40	9.34	9.34	0.00
43.00	9.14	1,636,695	941.39	9.33	9.33	0.00
43.20	9.14	1,636,560	941.39	9.33	9.33	0.00
43.40	9.14	1,636,430	941.39	9.32	9.32	0.00
43.60	9.14	1,636,305	941.39	9.31	9.31	0.00
43.80	9.14	1,636,183	941.39	9.31	9.31	0.00
44.00	9.14	1,636,067	941.39	9.30	9.30	0.00
44.20	9.14	1,635,954	941.39	9.30	9.30	0.00
44.40	9.14	1,635,845	941.39	9.29	9.29	0.00
44.60	9.14	1,635,740	941.39	9.29	9.29	0.00
44.80	9.14	1,635,638	941.39	9.28	9.28	0.00
45.00	9.14	1,635,540	941.38	9.28	9.28	0.00
45.20	9.14	1,635,445	941.38	9.27	9.27	0.00
45.40	9.14	1,635,354	941.38	9.27	9.27	0.00
45.60	9.14	1,635,266	941.38	9.26	9.26	0.00
45.80	9.14	1,635,181	941.38	9.26	9.26	0.00
46.00	9.14	1,635,098	941.38	9.25	9.25	0.00
46.20	9.14	1,635,019	941.38	9.25	9.25	0.00
46.40	9.14	1,634,942	941.38	9.25	9.25	0.00
46.60	9.14	1,634,868	941.38	9.24	9.24	0.00
46.80	9.14	1,634,797	941.38	9.24	9.24	0.00
47.00	9.14	1,634,728	941.38	9.23	9.23	0.00
47.20	9.14	1,634,661	941.38	9.23	9.23	0.00
47.40	9.14	1,634,597	941.38	9.23	9.23	0.00
47.60	9.14	1,634,535	941.38	9.23	9.23	0.00
47.80	9.14	1,634,475	941.38	9.22	9.22	0.00
48.00	9.14	1,634,417	941.38	9.22	9.22	0.00
48.20	9.14	1,634,361	941.37	9.22	9.22	0.00
48.40	9.14	1,634,307	941.37	9.21	9.21	0.00
48.60	9.14	1,634,254	941.37	9.21	9.21	0.00
48.80	9.14	1,634,204	941.37	9.21	9.21	0.00
49.00	9.14	1,634,155	941.37	9.21	9.21	0.00
49.20	9.14	1,634,108	941.37	9.20	9.20	0.00
49.40	9.14	1,634,063	941.37	9.20	9.20	0.00
49.60	9.14	1,634,019	941.37	9.20	9.20	0.00
49.80	9.14	1,633,977	941.37	9.20	9.20	0.00
50.00	9.14	1,633,936	941.37	9.20	9.20	0.00
50.20	9.14	1,633,896	941.37	9.19	9.19	0.00
50.40	9.14	1,633,858	941.37	9.19	9.19	0.00
50.60	9.14	1,633,821	941.37	9.19	9.19	0.00
50.80	9.14	1,633,786	941.37	9.19	9.19	0.00
51.00	9.14	1,633,751	941.37	9.19	9.19	0.00
51.20	9.14	1,633,718	941.37	9.19	9.19	0.00
51.40	9.14	1,633,686	941.37	9.18	9.18	0.00
51.60	9.14	1,633,655	941.37	9.18	9.18	0.00
51.80	9.14	1,633,625	941.37	9.18	9.18	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
52.00	9.14	1,633,596	941.37	9.18	9.18	0.00
52.20	9.14	1,633,568	941.37	9.18	9.18	0.00
52.40	9.14	1,633,541	941.37	9.18	9.18	0.00
52.60	9.14	1,633,515	941.37	9.18	9.18	0.00
52.80	9.14	1,633,490	941.37	9.17	9.17	0.00
53.00	9.14	1,633,466	941.37	9.17	9.17	0.00
53.20	9.14	1,633,442	941.37	9.17	9.17	0.00
53.40	9.14	1,633,420	941.37	9.17	9.17	0.00
53.60	9.14	1,633,398	941.37	9.17	9.17	0.00
53.80	9.14	1,633,377	941.37	9.17	9.17	0.00
54.00	9.14	1,633,356	941.37	9.17	9.17	0.00
54.20	9.14	1,633,336	941.37	9.17	9.17	0.00
54.40	9.14	1,633,317	941.37	9.17	9.17	0.00
54.60	9.14	1,633,299	941.37	9.17	9.17	0.00
54.80	9.14	1,633,281	941.37	9.16	9.16	0.00
55.00	9.14	1,633,264	941.37	9.16	9.16	0.00
55.20	9.14	1,633,247	941.37	9.16	9.16	0.00
55.40	9.14	1,633,231	941.37	9.16	9.16	0.00
55.60	9.14	1,633,216	941.37	9.16	9.16	0.00
55.80	9.14	1,633,201	941.37	9.16	9.16	0.00
56.00	9.14	1,633,186	941.37	9.16	9.16	0.00
56.20	9.14	1,633,172	941.37	9.16	9.16	0.00
56.40	9.14	1,633,159	941.36	9.16	9.16	0.00
56.60	9.14	1,633,146	941.36	9.16	9.16	0.00
56.80	9.14	1,633,133	941.36	9.16	9.16	0.00
57.00	9.14	1,633,121	941.36	9.16	9.16	0.00
57.20	9.14	1,633,109	941.36	9.16	9.16	0.00
57.40	9.14	1,633,098	941.36	9.16	9.16	0.00
57.60	9.14	1,633,087	941.36	9.16	9.16	0.00
57.80	9.14	1,633,076	941.36	9.15	9.15	0.00
58.00	9.14	1,633,066	941.36	9.15	9.15	0.00
58.20	9.14	1,633,056	941.36	9.15	9.15	0.00
58.40	9.14	1,633,046	941.36	9.15	9.15	0.00
58.60	9.14	1,633,037	941.36	9.15	9.15	0.00
58.80	9.14	1,633,028	941.36	9.15	9.15	0.00
59.00	9.14	1,633,019	941.36	9.15	9.15	0.00
59.20	9.14	1,633,011	941.36	9.15	9.15	0.00
59.40	9.14	1,633,003	941.36	9.15	9.15	0.00
59.60	9.14	1,632,995	941.36	9.15	9.15	0.00
59.80	9.14	1,632,988	941.36	9.15	9.15	0.00
60.00	9.14	1,632,980	941.36	9.15	9.15	0.00
60.20	9.14	1,632,973	941.36	9.15	9.15	0.00
60.40	9.14	1,632,967	941.36	9.15	9.15	0.00
60.60	9.14	1,632,960	941.36	9.15	9.15	0.00
60.80	9.14	1,632,954	941.36	9.15	9.15	0.00
61.00	9.14	1,632,947	941.36	9.15	9.15	0.00
61.20	9.14	1,632,942	941.36	9.15	9.15	0.00
61.40	9.14	1,632,936	941.36	9.15	9.15	0.00
61.60	9.14	1,632,930	941.36	9.15	9.15	0.00
61.80	9.14	1,632,925	941.36	9.15	9.15	0.00
62.00	9.14	1,632,920	941.36	9.15	9.15	0.00
62.20	9.14	1,632,915	941.36	9.15	9.15	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Hydrograph for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
62.40	9.14	1,632,910	941.36	9.15	9.15	0.00
62.60	9.14	1,632,905	941.36	9.15	9.15	0.00
62.80	9.14	1,632,901	941.36	9.15	9.15	0.00
63.00	9.14	1,632,897	941.36	9.15	9.15	0.00
63.20	9.14	1,632,892	941.36	9.15	9.15	0.00
63.40	9.14	1,632,888	941.36	9.15	9.15	0.00
63.60	9.14	1,632,884	941.36	9.15	9.15	0.00
63.80	9.14	1,632,881	941.36	9.15	9.15	0.00
64.00	9.14	1,632,877	941.36	9.14	9.14	0.00
64.20	9.14	1,632,873	941.36	9.14	9.14	0.00
64.40	9.14	1,632,870	941.36	9.14	9.14	0.00
64.60	9.14	1,632,867	941.36	9.14	9.14	0.00
64.80	9.14	1,632,863	941.36	9.14	9.14	0.00
65.00	9.14	1,632,860	941.36	9.14	9.14	0.00
65.20	9.14	1,632,857	941.36	9.14	9.14	0.00
65.40	9.14	1,632,855	941.36	9.14	9.14	0.00
65.60	9.14	1,632,852	941.36	9.14	9.14	0.00
65.80	9.14	1,632,849	941.36	9.14	9.14	0.00
66.00	9.14	1,632,846	941.36	9.14	9.14	0.00
66.20	9.14	1,632,844	941.36	9.14	9.14	0.00
66.40	9.14	1,632,842	941.36	9.14	9.14	0.00
66.60	9.14	1,632,839	941.36	9.14	9.14	0.00
66.80	9.14	1,632,837	941.36	9.14	9.14	0.00
67.00	9.14	1,632,835	941.36	9.14	9.14	0.00
67.20	9.14	1,632,833	941.36	9.14	9.14	0.00
67.40	9.14	1,632,831	941.36	9.14	9.14	0.00
67.60	9.14	1,632,829	941.36	9.14	9.14	0.00
67.80	9.14	1,632,827	941.36	9.14	9.14	0.00
68.00	9.14	1,632,825	941.36	9.14	9.14	0.00
68.20	9.14	1,632,823	941.36	9.14	9.14	0.00
68.40	9.14	1,632,821	941.36	9.14	9.14	0.00
68.60	9.14	1,632,820	941.36	9.14	9.14	0.00
68.80	9.14	1,632,818	941.36	9.14	9.14	0.00
69.00	9.14	1,632,817	941.36	9.14	9.14	0.00
69.20	9.14	1,632,815	941.36	9.14	9.14	0.00
69.40	9.14	1,632,814	941.36	9.14	9.14	0.00
69.60	9.14	1,632,812	941.36	9.14	9.14	0.00
69.80	9.14	1,632,811	941.36	9.14	9.14	0.00
70.00	9.14	1,632,810	941.36	9.14	9.14	0.00
70.20	9.14	1,632,808	941.36	9.14	9.14	0.00
70.40	9.14	1,632,807	941.36	9.14	9.14	0.00
70.60	9.14	1,632,806	941.36	9.14	9.14	0.00
70.80	9.14	1,632,805	941.36	9.14	9.14	0.00
71.00	9.14	1,632,804	941.36	9.14	9.14	0.00
71.20	9.14	1,632,803	941.36	9.14	9.14	0.00
71.40	9.14	1,632,802	941.36	9.14	9.14	0.00
71.60	9.14	1,632,801	941.36	9.14	9.14	0.00
71.80	9.14	1,632,800	941.36	9.14	9.14	0.00
72.00	9.14	1,632,799	941.36	9.14	9.14	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
911.00	0.00	0.00	0.00	915.16	0.00	0.00	0.00
911.08	0.00	0.00	0.00	915.24	0.00	0.00	0.00
911.16	0.00	0.00	0.00	915.32	0.00	0.00	0.00
911.24	0.00	0.00	0.00	915.40	0.00	0.00	0.00
911.32	0.00	0.00	0.00	915.48	0.00	0.00	0.00
911.40	0.00	0.00	0.00	915.56	0.00	0.00	0.00
911.48	0.00	0.00	0.00	915.64	0.00	0.00	0.00
911.56	0.00	0.00	0.00	915.72	0.00	0.00	0.00
911.64	0.00	0.00	0.00	915.80	0.00	0.00	0.00
911.72	0.00	0.00	0.00	915.88	0.00	0.00	0.00
911.80	0.00	0.00	0.00	915.96	0.00	0.00	0.00
911.88	0.00	0.00	0.00	916.04	0.00	0.00	0.00
911.96	0.00	0.00	0.00	916.12	0.00	0.00	0.00
912.04	0.00	0.00	0.00	916.20	0.00	0.00	0.00
912.12	0.00	0.00	0.00	916.28	0.00	0.00	0.00
912.20	0.00	0.00	0.00	916.36	0.00	0.00	0.00
912.28	0.00	0.00	0.00	916.44	0.00	0.00	0.00
912.36	0.00	0.00	0.00	916.52	0.00	0.00	0.00
912.44	0.00	0.00	0.00	916.60	0.00	0.00	0.00
912.52	0.00	0.00	0.00	916.68	0.00	0.00	0.00
912.60	0.00	0.00	0.00	916.76	0.00	0.00	0.00
912.68	0.00	0.00	0.00	916.84	0.00	0.00	0.00
912.76	0.00	0.00	0.00	916.92	0.00	0.00	0.00
912.84	0.00	0.00	0.00	917.00	0.00	0.00	0.00
912.92	0.00	0.00	0.00	917.08	0.00	0.00	0.00
913.00	0.00	0.00	0.00	917.16	0.00	0.00	0.00
913.08	0.00	0.00	0.00	917.24	0.00	0.00	0.00
913.16	0.00	0.00	0.00	917.32	0.00	0.00	0.00
913.24	0.00	0.00	0.00	917.40	0.00	0.00	0.00
913.32	0.00	0.00	0.00	917.48	0.00	0.00	0.00
913.40	0.00	0.00	0.00	917.56	0.00	0.00	0.00
913.48	0.00	0.00	0.00	917.64	0.00	0.00	0.00
913.56	0.00	0.00	0.00	917.72	0.00	0.00	0.00
913.64	0.00	0.00	0.00	917.80	0.00	0.00	0.00
913.72	0.00	0.00	0.00	917.88	0.00	0.00	0.00
913.80	0.00	0.00	0.00	917.96	0.00	0.00	0.00
913.88	0.00	0.00	0.00	918.04	0.00	0.00	0.00
913.96	0.00	0.00	0.00	918.12	0.00	0.00	0.00
914.04	0.00	0.00	0.00	918.20	0.00	0.00	0.00
914.12	0.00	0.00	0.00	918.28	0.00	0.00	0.00
914.20	0.00	0.00	0.00	918.36	0.00	0.00	0.00
914.28	0.00	0.00	0.00	918.44	0.00	0.00	0.00
914.36	0.00	0.00	0.00	918.52	0.00	0.00	0.00
914.44	0.00	0.00	0.00	918.60	0.00	0.00	0.00
914.52	0.00	0.00	0.00	918.68	0.00	0.00	0.00
914.60	0.00	0.00	0.00	918.76	0.00	0.00	0.00
914.68	0.00	0.00	0.00	918.84	0.00	0.00	0.00
914.76	0.00	0.00	0.00	918.92	0.00	0.00	0.00
914.84	0.00	0.00	0.00	919.00	0.00	0.00	0.00
914.92	0.00	0.00	0.00	919.08	0.00	0.00	0.00
915.00	0.00	0.00	0.00	919.16	0.00	0.00	0.00
915.08	0.00	0.00	0.00	919.24	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

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Printed 10/26/2012

Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
919.32	0.00	0.00	0.00	923.48	0.00	0.00	0.00
919.40	0.00	0.00	0.00	923.56	0.00	0.00	0.00
919.48	0.00	0.00	0.00	923.64	0.00	0.00	0.00
919.56	0.00	0.00	0.00	923.72	0.00	0.00	0.00
919.64	0.00	0.00	0.00	923.80	0.00	0.00	0.00
919.72	0.00	0.00	0.00	923.88	0.00	0.00	0.00
919.80	0.00	0.00	0.00	923.96	0.00	0.00	0.00
919.88	0.00	0.00	0.00	924.04	0.00	0.00	0.00
919.96	0.00	0.00	0.00	924.12	0.00	0.00	0.00
920.04	0.00	0.00	0.00	924.20	0.00	0.00	0.00
920.12	0.00	0.00	0.00	924.28	0.00	0.00	0.00
920.20	0.00	0.00	0.00	924.36	0.00	0.00	0.00
920.28	0.00	0.00	0.00	924.44	0.00	0.00	0.00
920.36	0.00	0.00	0.00	924.52	0.00	0.00	0.00
920.44	0.00	0.00	0.00	924.60	0.00	0.00	0.00
920.52	0.00	0.00	0.00	924.68	0.00	0.00	0.00
920.60	0.00	0.00	0.00	924.76	0.00	0.00	0.00
920.68	0.00	0.00	0.00	924.84	0.00	0.00	0.00
920.76	0.00	0.00	0.00	924.92	0.00	0.00	0.00
920.84	0.00	0.00	0.00	925.00	0.00	0.00	0.00
920.92	0.00	0.00	0.00	925.08	0.00	0.00	0.00
921.00	0.00	0.00	0.00	925.16	0.00	0.00	0.00
921.08	0.00	0.00	0.00	925.24	0.00	0.00	0.00
921.16	0.00	0.00	0.00	925.32	0.00	0.00	0.00
921.24	0.00	0.00	0.00	925.40	0.00	0.00	0.00
921.32	0.00	0.00	0.00	925.48	0.00	0.00	0.00
921.40	0.00	0.00	0.00	925.56	0.00	0.00	0.00
921.48	0.00	0.00	0.00	925.64	0.00	0.00	0.00
921.56	0.00	0.00	0.00	925.72	0.00	0.00	0.00
921.64	0.00	0.00	0.00	925.80	0.00	0.00	0.00
921.72	0.00	0.00	0.00	925.88	0.00	0.00	0.00
921.80	0.00	0.00	0.00	925.96	0.00	0.00	0.00
921.88	0.00	0.00	0.00	926.04	0.00	0.00	0.00
921.96	0.00	0.00	0.00	926.12	0.00	0.00	0.00
922.04	0.00	0.00	0.00	926.20	0.00	0.00	0.00
922.12	0.00	0.00	0.00	926.28	0.00	0.00	0.00
922.20	0.00	0.00	0.00	926.36	0.00	0.00	0.00
922.28	0.00	0.00	0.00	926.44	0.00	0.00	0.00
922.36	0.00	0.00	0.00	926.52	0.00	0.00	0.00
922.44	0.00	0.00	0.00	926.60	0.00	0.00	0.00
922.52	0.00	0.00	0.00	926.68	0.00	0.00	0.00
922.60	0.00	0.00	0.00	926.76	0.00	0.00	0.00
922.68	0.00	0.00	0.00	926.84	0.00	0.00	0.00
922.76	0.00	0.00	0.00	926.92	0.00	0.00	0.00
922.84	0.00	0.00	0.00	927.00	0.00	0.00	0.00
922.92	0.00	0.00	0.00	927.08	0.00	0.00	0.00
923.00	0.00	0.00	0.00	927.16	0.00	0.00	0.00
923.08	0.00	0.00	0.00	927.24	0.00	0.00	0.00
923.16	0.00	0.00	0.00	927.32	0.00	0.00	0.00
923.24	0.00	0.00	0.00	927.40	0.00	0.00	0.00
923.32	0.00	0.00	0.00	927.48	0.00	0.00	0.00
923.40	0.00	0.00	0.00	927.56	0.00	0.00	0.00

Pond 2 & 3 Model_Proposed Conditions

Prepared by URS Corp.

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
927.64	0.00	0.00	0.00	931.80	0.12	0.12	0.00
927.72	0.00	0.00	0.00	931.88	0.24	0.24	0.00
927.80	0.00	0.00	0.00	931.96	0.41	0.41	0.00
927.88	0.00	0.00	0.00	932.04	0.62	0.62	0.00
927.96	0.00	0.00	0.00	932.12	0.86	0.86	0.00
928.04	0.00	0.00	0.00	932.20	1.11	1.11	0.00
928.12	0.00	0.00	0.00	932.28	1.33	1.33	0.00
928.20	0.00	0.00	0.00	932.36	1.54	1.54	0.00
928.28	0.00	0.00	0.00	932.44	1.71	1.71	0.00
928.36	0.00	0.00	0.00	932.52	1.87	1.87	0.00
928.44	0.00	0.00	0.00	932.60	2.02	2.02	0.00
928.52	0.00	0.00	0.00	932.68	2.15	2.15	0.00
928.60	0.00	0.00	0.00	932.76	2.28	2.28	0.00
928.68	0.00	0.00	0.00	932.84	2.40	2.40	0.00
928.76	0.00	0.00	0.00	932.92	2.52	2.52	0.00
928.84	0.00	0.00	0.00	933.00	2.63	2.63	0.00
928.92	0.00	0.00	0.00	933.08	2.73	2.73	0.00
929.00	0.00	0.00	0.00	933.16	2.83	2.83	0.00
929.08	0.00	0.00	0.00	933.24	2.93	2.93	0.00
929.16	0.00	0.00	0.00	933.32	3.03	3.03	0.00
929.24	0.00	0.00	0.00	933.40	3.12	3.12	0.00
929.32	0.00	0.00	0.00	933.48	3.21	3.21	0.00
929.40	0.00	0.00	0.00	933.56	3.29	3.29	0.00
929.48	0.00	0.00	0.00	933.64	3.38	3.38	0.00
929.56	0.00	0.00	0.00	933.72	3.46	3.46	0.00
929.64	0.00	0.00	0.00	933.80	3.54	3.54	0.00
929.72	0.00	0.00	0.00	933.88	3.62	3.62	0.00
929.80	0.00	0.00	0.00	933.96	3.70	3.70	0.00
929.88	0.00	0.00	0.00	934.04	3.77	3.77	0.00
929.96	0.00	0.00	0.00	934.12	3.85	3.85	0.00
930.04	0.00	0.00	0.00	934.20	3.92	3.92	0.00
930.12	0.00	0.00	0.00	934.28	3.99	3.99	0.00
930.20	0.00	0.00	0.00	934.36	4.06	4.06	0.00
930.28	0.00	0.00	0.00	934.44	4.13	4.13	0.00
930.36	0.00	0.00	0.00	934.52	4.20	4.20	0.00
930.44	0.00	0.00	0.00	934.60	4.26	4.26	0.00
930.52	0.00	0.00	0.00	934.68	4.33	4.33	0.00
930.60	0.00	0.00	0.00	934.76	4.39	4.39	0.00
930.68	0.00	0.00	0.00	934.84	4.46	4.46	0.00
930.76	0.00	0.00	0.00	934.92	4.52	4.52	0.00
930.84	0.00	0.00	0.00	935.00	4.58	4.58	0.00
930.92	0.00	0.00	0.00	935.08	4.64	4.64	0.00
931.00	0.00	0.00	0.00	935.16	4.70	4.70	0.00
931.08	0.00	0.00	0.00	935.24	4.76	4.76	0.00
931.16	0.00	0.00	0.00	935.32	4.82	4.82	0.00
931.24	0.00	0.00	0.00	935.40	4.88	4.88	0.00
931.32	0.00	0.00	0.00	935.48	4.94	4.94	0.00
931.40	0.00	0.00	0.00	935.56	4.99	4.99	0.00
931.48	0.00	0.00	0.00	935.64	5.05	5.05	0.00
931.56	0.00	0.00	0.00	935.72	5.11	5.11	0.00
931.64	0.01	0.01	0.00	935.80	5.16	5.16	0.00
931.72	0.05	0.05	0.00	935.88	5.21	5.21	0.00

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
935.96	5.27	5.27	0.00	940.12	7.55	7.55	0.00
936.04	5.32	5.32	0.00	940.20	7.59	7.59	0.00
936.12	5.37	5.37	0.00	940.28	7.63	7.63	0.00
936.20	5.43	5.43	0.00	940.36	7.66	7.66	0.00
936.28	5.48	5.48	0.00	940.44	7.70	7.70	0.00
936.36	5.53	5.53	0.00	940.52	7.74	7.74	0.00
936.44	5.58	5.58	0.00	940.60	7.77	7.77	0.00
936.52	5.63	5.63	0.00	940.68	7.81	7.81	0.00
936.60	5.68	5.68	0.00	940.76	7.85	7.85	0.00
936.68	5.73	5.73	0.00	940.84	7.88	7.88	0.00
936.76	5.78	5.78	0.00	940.92	7.92	7.92	0.00
936.84	5.83	5.83	0.00	941.00	7.97	7.97	0.00
936.92	5.88	5.88	0.00	941.08	8.08	8.08	0.00
937.00	5.92	5.92	0.00	941.16	8.26	8.26	0.00
937.08	5.97	5.97	0.00	941.24	8.54	8.54	0.00
937.16	6.02	6.02	0.00	941.32	8.91	8.91	0.00
937.24	6.06	6.06	0.00	941.40	9.37	9.37	0.00
937.32	6.11	6.11	0.00	941.48	9.92	9.92	0.00
937.40	6.16	6.16	0.00	941.56	10.54	10.54	0.00
937.48	6.20	6.20	0.00	941.64	11.23	11.23	0.00
937.56	6.25	6.25	0.00	941.72	11.98	11.98	0.00
937.64	6.29	6.29	0.00	941.80	12.78	12.78	0.00
937.72	6.34	6.34	0.00	941.88	13.63	13.63	0.00
937.80	6.38	6.38	0.00	941.96	14.51	14.51	0.00
937.88	6.42	6.42	0.00	942.04	15.41	15.41	0.00
937.96	6.47	6.47	0.00	942.12	16.32	16.32	0.00
938.04	6.51	6.51	0.00	942.20	17.22	17.22	0.00
938.12	6.56	6.56	0.00	942.28	18.09	18.09	0.00
938.20	6.60	6.60	0.00	942.36	18.90	18.90	0.00
938.28	6.64	6.64	0.00	942.44	19.61	19.61	0.00
938.36	6.68	6.68	0.00	942.52	20.87	20.30	0.57
938.44	6.72	6.72	0.00	942.60	27.25	20.89	6.36
938.52	6.77	6.77	0.00	942.68	36.85	21.50	15.35
938.60	6.81	6.81	0.00	942.76	48.79	22.09	26.71
938.68	6.85	6.85	0.00	942.84	62.71	22.65	40.06
938.76	6.89	6.89	0.00	942.92	78.31	23.19	55.12
938.84	6.93	6.93	0.00	943.00	95.31	23.72	71.59
938.92	6.97	6.97	0.00	943.08	113.67	24.22	89.45
939.00	7.01	7.01	0.00	943.16	132.57	24.72	107.85
939.08	7.05	7.05	0.00	943.24	152.10	25.20	126.90
939.16	7.09	7.09	0.00	943.32	172.64	25.67	146.97
939.24	7.13	7.13	0.00	943.40	194.86	26.13	168.74
939.32	7.17	7.17	0.00	943.48	218.01	26.57	191.43
939.40	7.21	7.21	0.00	943.56	242.52	27.01	215.51
939.48	7.25	7.25	0.00	943.64	268.17	27.44	240.73
939.56	7.29	7.29	0.00	943.72	294.67	27.86	266.81
939.64	7.33	7.33	0.00	943.80	321.75	28.27	293.48
939.72	7.36	7.36	0.00	943.88	349.66	28.67	320.98
939.80	7.40	7.40	0.00	943.96	377.97	29.07	348.90
939.88	7.44	7.44	0.00	944.04	406.85	29.46	377.39
939.96	7.48	7.48	0.00	944.12	436.56	29.85	406.71
940.04	7.52	7.52	0.00	944.20	467.43	30.22	437.21

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Discharge for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
944.28	499.03	30.60	468.43
944.36	531.33	30.96	500.36
944.44	564.31	31.32	532.99
944.52	597.98	31.68	566.30
944.60	632.30	32.03	600.27
944.68	667.27	32.38	634.89
944.76	702.88	32.72	670.16
944.84	739.12	33.06	706.06
944.92	775.97	33.39	742.57
945.00	813.42	33.72	779.70
945.08	851.47	34.05	817.42
945.16	890.11	34.37	855.74
945.24	929.32	34.69	894.63
945.32	969.10	35.01	934.09
945.40	1,009.44	35.32	974.12
945.48	1,050.34	35.63	1,014.71
945.56	1,091.78	35.94	1,055.84
945.64	1,133.76	36.24	1,097.52
945.72	1,176.27	36.54	1,139.73
945.80	1,219.30	36.84	1,182.46
945.88	1,262.85	37.13	1,225.72
945.96	1,306.92	37.42	1,269.50

Pond 2 & 3 Model_Proposed Conditions

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Stage-Area-Storage for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
911.00	0	915.16	37,404	919.32	128,070
911.08	260	915.24	38,734	919.40	130,300
911.16	521	915.32	40,065	919.48	132,530
911.24	781	915.40	41,396	919.56	134,760
911.32	1,042	915.48	42,727	919.64	136,990
911.40	1,302	915.56	44,058	919.72	139,220
911.48	1,562	915.64	45,388	919.80	141,451
911.56	1,823	915.72	46,719	919.88	143,681
911.64	2,083	915.80	48,050	919.96	145,911
911.72	2,344	915.88	49,381	920.04	148,246
911.80	2,604	915.96	50,712	920.12	150,686
911.88	2,864	916.04	52,173	920.20	153,126
911.96	3,125	916.12	53,766	920.28	155,565
912.04	3,542	916.20	55,359	920.36	158,005
912.12	4,115	916.28	56,952	920.44	160,445
912.20	4,689	916.36	58,545	920.52	162,885
912.28	5,263	916.44	60,138	920.60	165,325
912.36	5,836	916.52	61,731	920.68	167,765
912.44	6,410	916.60	63,324	920.76	170,204
912.52	6,983	916.68	64,917	920.84	172,644
912.60	7,557	916.76	66,510	920.92	175,084
912.68	8,131	916.84	68,103	921.00	177,524
912.76	8,704	916.92	69,696	921.08	180,156
912.84	9,278	917.00	71,289	921.16	182,787
912.92	9,851	917.08	73,101	921.24	185,419
913.00	10,425	917.16	74,914	921.32	188,051
913.08	11,289	917.24	76,726	921.40	190,682
913.16	12,154	917.32	78,538	921.48	193,314
913.24	13,018	917.40	80,351	921.56	195,946
913.32	13,882	917.48	82,163	921.64	198,577
913.40	14,747	917.56	83,975	921.72	201,209
913.48	15,611	917.64	85,788	921.80	203,841
913.56	16,475	917.72	87,600	921.88	206,472
913.64	17,340	917.80	89,412	921.96	209,104
913.72	18,204	917.88	91,225	922.04	211,838
913.80	19,068	917.96	93,037	922.12	214,673
913.88	19,933	918.04	94,951	922.20	217,508
913.96	20,797	918.12	96,968	922.28	220,343
914.04	21,770	918.20	98,984	922.36	223,178
914.12	22,851	918.28	101,001	922.44	226,013
914.20	23,932	918.36	103,017	922.52	228,848
914.28	25,013	918.44	105,034	922.60	231,683
914.36	26,094	918.52	107,050	922.68	234,519
914.44	27,175	918.60	109,067	922.76	237,354
914.52	28,256	918.68	111,083	922.84	240,189
914.60	29,337	918.76	113,100	922.92	243,024
914.68	30,418	918.84	115,116	923.00	245,859
914.76	31,499	918.92	117,133	923.08	248,691
914.84	32,580	919.00	119,149	923.16	252,042
914.92	33,661	919.08	121,379	923.24	255,134
915.00	34,742	919.16	123,609	923.32	258,225
915.08	36,073	919.24	125,839	923.40	261,317

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

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Stage-Area-Storage for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
923.48	264,409	927.64	468,516	931.80	749,999
923.56	267,500	927.72	473,145	931.88	756,096
923.64	270,592	927.80	477,774	931.96	762,193
923.72	273,683	927.88	482,403	932.04	768,333
923.80	276,775	927.96	487,032	932.12	774,516
923.88	279,867	928.04	491,834	932.20	780,699
923.96	282,958	928.12	496,809	932.28	786,882
924.04	286,258	928.20	501,784	932.36	793,064
924.12	289,765	928.28	506,759	932.44	799,247
924.20	293,272	928.36	511,734	932.52	805,430
924.28	296,779	928.44	516,709	932.60	811,612
924.36	300,286	928.52	521,684	932.68	817,795
924.44	303,793	928.60	526,659	932.76	823,978
924.52	307,300	928.68	531,633	932.84	830,161
924.60	310,807	928.76	536,608	932.92	836,343
924.68	314,315	928.84	541,583	933.00	842,526
924.76	317,822	928.92	546,558	933.08	848,850
924.84	321,329	929.00	551,533	933.16	855,175
924.92	324,836	929.08	556,886	933.24	861,499
925.00	328,343	929.16	562,239	933.32	867,824
925.08	332,297	929.24	567,591	933.40	874,148
925.16	336,251	929.32	572,944	933.48	880,472
925.24	340,205	929.40	578,297	933.56	886,797
925.32	344,159	929.48	583,650	933.64	893,121
925.40	348,113	929.56	589,003	933.72	899,446
925.48	352,067	929.64	594,355	933.80	905,770
925.56	356,022	929.72	599,708	933.88	912,094
925.64	359,976	929.80	605,061	933.96	918,419
925.72	363,930	929.88	610,414	934.04	924,815
925.80	367,884	929.96	615,767	934.12	931,284
925.88	371,838	930.04	621,308	934.20	937,752
925.96	375,792	930.12	627,037	934.28	944,221
926.04	379,918	930.20	632,766	934.36	950,689
926.12	384,215	930.28	638,495	934.44	957,158
926.20	388,512	930.36	644,225	934.52	963,626
926.28	392,809	930.44	649,954	934.60	970,095
926.36	397,106	930.52	655,683	934.68	976,563
926.44	401,404	930.60	661,413	934.76	983,032
926.52	405,701	930.68	667,142	934.84	989,500
926.60	409,998	930.76	672,871	934.92	995,969
926.68	414,295	930.84	678,600	935.00	1,002,437
926.76	418,592	930.92	684,330	935.08	1,009,065
926.84	422,890	931.00	690,059	935.16	1,015,694
926.92	427,187	931.08	696,053	935.24	1,022,322
927.00	431,484	931.16	702,047	935.32	1,028,951
927.08	436,113	931.24	708,041	935.40	1,035,579
927.16	440,742	931.32	714,035	935.48	1,042,207
927.24	445,371	931.40	720,029	935.56	1,048,836
927.32	450,000	931.48	726,023	935.64	1,055,464
927.40	454,629	931.56	732,017	935.72	1,062,093
927.48	459,258	931.64	738,011	935.80	1,068,721
927.56	463,887	931.72	744,005	935.88	1,075,349

Pond 2 & 3 Model_Proposed Conditions

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Stage-Area-Storage for Pond Pond 3: Pond 3 (Starting W.S.E. 931.59) (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
935.96	1,081,978	940.12	1,488,543	944.28	1,990,538
936.04	1,089,188	940.20	1,497,644	944.36	2,000,856
936.12	1,096,980	940.28	1,506,746	944.44	2,011,174
936.20	1,104,772	940.36	1,515,848	944.52	2,021,493
936.28	1,112,564	940.44	1,524,949	944.60	2,031,811
936.36	1,120,356	940.52	1,534,051	944.68	2,042,129
936.44	1,128,148	940.60	1,543,153	944.76	2,052,447
936.52	1,135,940	940.68	1,552,254	944.84	2,062,766
936.60	1,143,732	940.76	1,561,356	944.92	2,073,084
936.68	1,151,524	940.84	1,570,458	945.00	2,083,402
936.76	1,159,316	940.92	1,579,559	945.08	2,094,013
936.84	1,167,108	941.00	1,588,661	945.16	2,104,623
936.92	1,174,900	941.08	1,598,415	945.24	2,115,234
937.00	1,182,692	941.16	1,608,168	945.32	2,125,845
937.08	1,190,483	941.24	1,617,922	945.40	2,136,455
937.16	1,198,275	941.32	1,627,676	945.48	2,147,066
937.24	1,206,067	941.40	1,637,429	945.56	2,157,676
937.32	1,213,859	941.48	1,647,183	945.64	2,168,287
937.40	1,221,651	941.56	1,656,937	945.72	2,178,898
937.48	1,229,443	941.64	1,666,690	945.80	2,189,508
937.56	1,237,235	941.72	1,676,444	945.88	2,200,119
937.64	1,245,027	941.80	1,686,198	945.96	2,210,730
937.72	1,252,819	941.88	1,695,951		
937.80	1,260,611	941.96	1,705,705		
937.88	1,268,403	942.04	1,715,459		
937.96	1,276,195	942.12	1,725,213		
938.04	1,283,987	942.20	1,734,966		
938.12	1,291,779	942.28	1,744,720		
938.20	1,299,571	942.36	1,754,474		
938.28	1,307,363	942.44	1,764,227		
938.36	1,315,155	942.52	1,773,981		
938.44	1,322,947	942.60	1,783,735		
938.52	1,330,739	942.68	1,793,488		
938.60	1,338,531	942.76	1,803,242		
938.68	1,346,323	942.84	1,812,996		
938.76	1,354,115	942.92	1,822,749		
938.84	1,361,907	943.00	1,832,503		
938.92	1,369,699	943.08	1,842,257		
939.00	1,377,491	943.16	1,852,010		
939.08	1,385,282	943.24	1,861,764		
939.16	1,393,074	943.32	1,871,518		
939.24	1,400,866	943.40	1,881,271		
939.32	1,408,658	943.48	1,891,025		
939.40	1,416,450	943.56	1,900,779		
939.48	1,424,242	943.64	1,910,532		
939.56	1,432,034	943.72	1,920,286		
939.64	1,439,826	943.80	1,930,040		
939.72	1,447,618	943.88	1,939,793		
939.80	1,455,410	943.96	1,949,547		
939.88	1,463,202	944.04	1,959,583		
939.96	1,470,994	944.12	1,969,901		
940.04	1,479,441	944.20	1,980,220		

Pond 2 & 3 Model_Proposed Conditions

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Page 1

Summary for Pond Pond 2 Discharge Cap.: Pond 2 Discharge Capacity

Additional 6.9-cfs Inflow from Pitts Pond (2,100GPM), Pitts Quarry (1,000GPM), & Sed. Traps 6 & 7 (1,000GPM) Is Included

Inflow	=	9.14 cfs @	0.00 hrs,	Volume=	54.394 af,	Incl. 9.14 cfs Base Flow
Outflow	=	9.14 cfs @	0.01 hrs,	Volume=	54.394 af,	Atten= 0%, Lag= 0.6 min
Primary	=	0.32 cfs @	0.01 hrs,	Volume=	1.912 af	
Secondary	=	8.82 cfs @	0.01 hrs,	Volume=	52.482 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 932.50' Surf.Area= 0 sf Storage= 0 cf

Peak Elev= 943.90' @ 0.00 hrs Surf.Area= 100 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.0 min (2,160.0 - 2,160.0)

Volume Invert Avail.Storage Storage Description

#1	943.90'	15 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
----	---------	-------	------------------------------------------------------------

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
943.90	100	0	0
944.00	200	15	15

Device Routing Invert Outlet Devices

#1	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 82.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.18' S= 0.1377 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#2	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.47' S= 0.1375 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#3	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 931.42' S= 0.1256 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#4	Primary	941.47'	8.0" Round Top of 8" Perf. Riser L= 80.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 930.70' S= 0.1346 '/' Cc= 0.900 n= 0.012, Flow Area= 0.35 sf
#5	Primary	941.47'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.47' / 940.28' S= 0.0238 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#6	Primary	941.62'	18.0" Round 18" Culvert L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 941.62' / 940.20' S= 0.0284 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#7	Secondary	942.50'	80.0' long x 40.0' breadth 80' Emergency Spillway

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Type II 24-hr 10-yr Rainfall=4.80"

Printed 10/26/2012

Page 2

#8	Secondary	942.50'	Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
			Coef. (English)	2.68	2.70	2.70	2.64	2.63	2.64	2.64	2.63
#9	Secondary	942.50'	25.0' long x 40.0' breadth 25' Emergency Spillway								
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
			Coef. (English)	2.68	2.70	2.70	2.64	2.63	2.64	2.64	2.63
			50.0' long x 40.0' breadth 50' Emergency Spillway								
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
			Coef. (English)	2.68	2.70	2.70	2.64	2.63	2.64	2.64	2.63

Primary OutFlow Max=0.00 cfs @ 0.01 hrs HW=943.90' (Free Discharge)

1=Top of 8" Perf. Riser	(Passes 0.00 cfs of 1.92 cfs potential flow)
2=Top of 8" Perf. Riser	(Passes 0.00 cfs of 1.92 cfs potential flow)
3=Top of 8" Perf. Riser	(Passes 0.00 cfs of 1.92 cfs potential flow)
4=Top of 8" Perf. Riser	(Passes 0.00 cfs of 1.92 cfs potential flow)
5=18" Culvert	(Passes 0.00 cfs of 8.71 cfs potential flow)
6=18" Culvert	(Passes 0.00 cfs of 8.31 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=943.90' (Free Discharge)

7=80' Emergency Spillway	(Passes 0.00 cfs of 349.85 cfs potential flow)
8=25' Emergency Spillway	(Passes 0.00 cfs of 109.33 cfs potential flow)
9=50' Emergency Spillway	(Passes 0.00 cfs of 218.66 cfs potential flow)

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Type II 24-hr 10-yr Rainfall=4.80"

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Page 3

Stage-Discharge for Pond Pond 2 Discharge Cap.: Pond 2 Discharge Capacity

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
943.90	0.00	0.00	0.00
943.91	709.76	24.77	684.99
943.92	717.00	24.84	692.16
943.93	724.26	24.91	699.35
943.94	731.55	24.99	706.56
943.95	738.85	25.06	713.80
943.96	746.19	25.13	721.06
943.97	753.54	25.20	728.34
943.98	760.91	25.27	735.65
943.99	768.31	25.34	742.97
944.00	775.73	25.40	750.32