NONDEGRADATION REVIEW

(Public Review Draft)

Part A – Nondegradation Loading Assessment

Part B – Nondegradation Report

Apple Valley, MN

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Part A – Nondegradation Loading Assessment

Executive Summary – Loading Assessment

The purpose of this report is to present the methods and results for the pollutant loading assessment portion of the Nondegradation Review requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) General Permit, Part X., Appendix D., Section B. Apple Valley is one of thirty MS4s in the state to which the Nondegradation Review requirement applies. The Nondegradation Review loading assessment provides calculated values that illustrate the degree to which the past and current Best Management Practice (BMP) applications have and can achieve compliance with proposed nondegradation loading criteria focusing on runoff volume, total suspended solids (TSS), and total phosphorus (TP).

The PONDNET watershed model was selected as the primary tool for the Nondegradation Review loading assessment. The model estimates runoff volumes, TP, and now, TSS for a wide range of urban and non-urban land uses. The TSS component is a recent enhancement to the PONDNET model. It has been reviewed by MPCA staff who have indicated the calculation strategy was reasonable and would be adequate for the Nondegradation pollutant loading analysis. Selection of loading rates for key land uses was based on a combination of literature-cited values combined with professional judgement regarding which specific values within a range applicable to this area were appropriate for the City of Apple Valley. Discussions were held with MPCA to explain how key input parameters were chosen and develop a reasonable approach to performing the loading assessment.

Proposed MPCA regulations require a comparison of conditions between Baseline (1988-1990) and Present (2000-2005), and between Present and Ultimate Development or the year 2020, whichever occurs first. The permittees are to use the best available data that best matches these milestone years. In Apple Valley's case, the land use information obtained for Baseline, Present and Ultimate Development corresponded to the years of 1990, 2005, and 2020, respectively.

The approach for the loading assessment employs PONDNET as a watershed routing function to estimate TP load, total suspended sediment load, and runoff volume from a broad range of land uses that cover urban and non-urban conditions. The PONDNET model was adapted to account for 16 different land uses. These included row crop agriculture, farmstead, and open space on the non-urban end of the land use spectrum and three different residential land use categories, as well as neighborhood services, commercial, industrial, institutional, park, golf course, and right-of-way land uses for the urban environment. Loading rates for each land use category were derived by an event mean concentration (EMC) for TP and TSS, and an annual volumetric runoff coefficient. Lastly, an average annual precipitation was used to derive the annual load from each land use.

As part of the City of Apple Valley's loading assessment, load estimates were generated for seven locations at the boundary of Apple Valley with adjacent communities and where significant stormwater discharges to those communities from occur Apple Valley. The locations of these load estimation points as well as the drainage districts for each point are shown on Figure ES-1. Together, the drainage areas for the seven inter-jurisdictional load estimation points cover the entire City. Figure ES-1 also shows the degree to which each of the seven drainage districts comprising the City meet the nondegradation criteria for the three parameters (average annual total phosphorus, total suspended solids, and runoff volume) compared to the

Baseline condition. Blue shading means that the estimated load for that particular parameter and time period are less than or equal to the estimated load for the Baseline condition. Brown shading means that the estimated load for the particular parameter and time period is greater than the estimated load for the Baseline condition. The numerical value in the brown-shaded boxes indicates by what percentage the load exceeds the Baseline condition.

In general, land uses changes since the Baseline condition of 1990 and installation of wet detention basins are the primary influences affecting the results of the loading assessments. For example, since the 1990 Baseline condition, 44 wet detention basins have been installed to mitigate total phosphorus and total suspended solids loads from urban land uses. Cumulatively, the area of these wet detention basins is about 60 acres and the wet volume storage about 235 acre-feet. These wet detention basins were sized according to the City of Apple Valley's performance criteria and modeling shows that each wet detention BMP generally achieves removal efficiencies of 40-50% for total phosphorus and 60-70% for total suspended solids. In addition, the City's 2007 Surface Water Management Plan contains policies that require new and re-development projects creating over 0.2 acres of new impervious area to, at a minimum, meet a no-net-increase standard for average annual loads of total phosphorus and total suspended solids and average annual runoff volume compared to the pre-development baseline condition. The effect of this policy has been applied to the Ultimate condition load estimates.

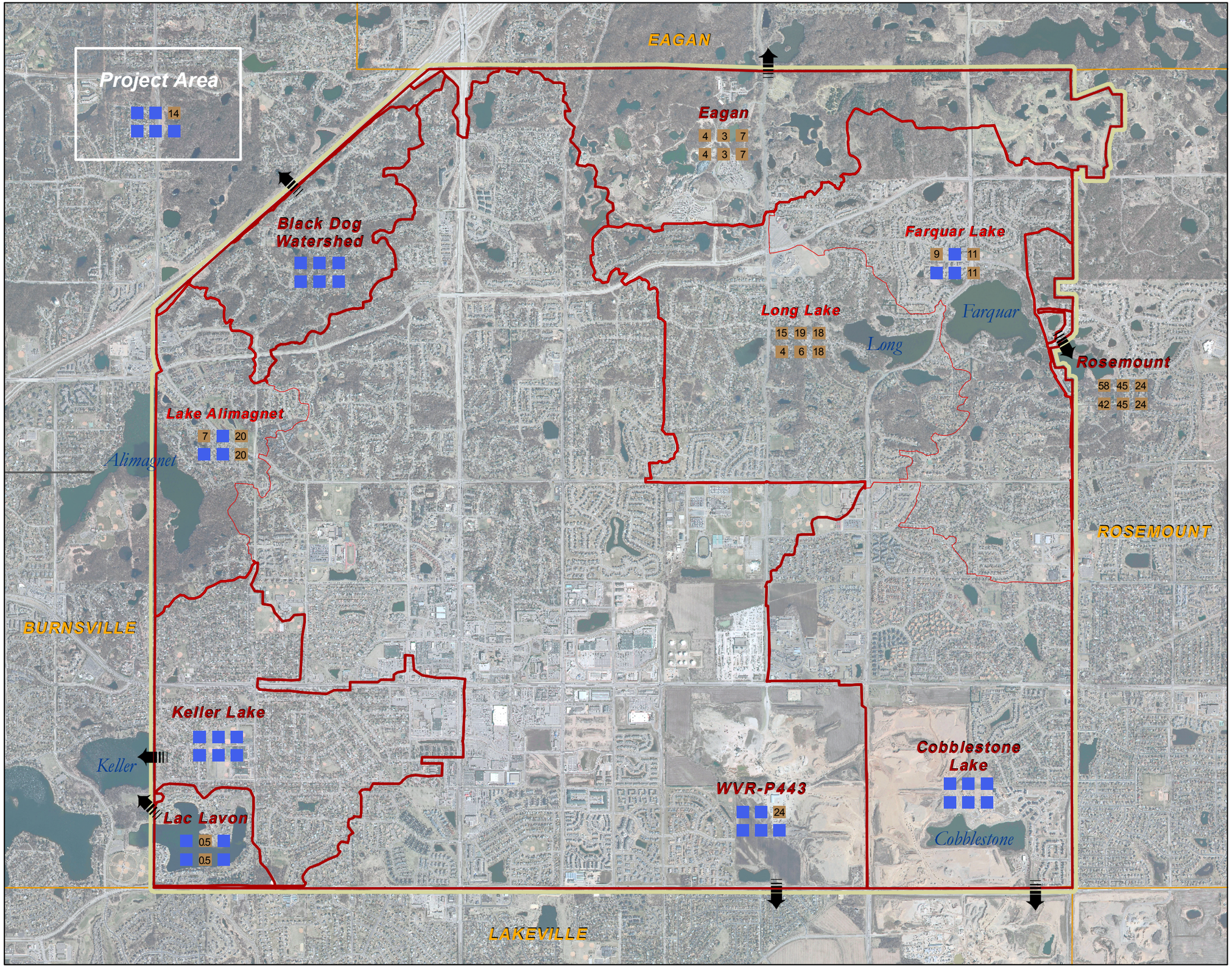
There are several other important factors that significantly affect the loading assessment results for individual drainage districts and which are reflected in the loading assessment summary for those districts. These are as follows:

1. East Vermillion River (EVR) drainage district at the Cobblestone Lake load estimation point. The operational history of the Cobblestone Lake lift station that acts as the outlet for this District was used to adjust modeled loads. Since the lift station was installed in 2001, there have been no recorded discharges from the lift station to Lakeville (except for short-term maintenance operations to test the operational condition of the lift station). Further, the City of Apple Valley's policy as stated in its 2007 Surface Water Management Plan is to protect the infiltration capacity of Cobblestone Lake so that it does not discharge in the future under average annual precipitation conditions. Thus, since the outflow under the Present condition is known to be zero, and there are management policies in place to protect the infiltration capacity of Cobblestone Lake to help ensure that discharges will not occur under the Ultimate development condition, both Present and Ultimate water loads are shown as meeting the Baseline condition.
2. West Vermillion River (WVR) drainage district at the Pond WVR-P443 load estimation point. Modeling results for this drainage show that runoff volume for the Present condition is significantly above that for the Baseline condition for this drainage, and would be for the Ultimate condition as well. The City's 2007 Surface Water Management Plan calls for planning and execution of a project to divert a portion of the outflow from Pond WVR-443 to the East Vermillion River District, at least in part to decrease the volume of runoff discharged to Lakeville by taking advantage of high infiltration capacities in the southeastern area of the City near Cobblestone Lake. Sizing the diversion to meet nondegradation Baseline condition for runoff volume from this drainage will be a consideration in the design of the project. Delivery of flow volumes in excess of nondegradation Baseline conditions across the jurisdictional boundary with Lakeville from Pond WVR-P443 is likely to be determined in part by the City of Lakeville's desire to receive those flows. An evaluation of

that project is planned in cooperation with the Vermillion River Watershed Joint Powers Organization.

3. **Keller Lake (KL) drainage district at the Keller Lake inflow load estimation point.** The Ultimate condition average annual total phosphorus and total suspended solids loads account for the effect of the planned construction of a detention basin to treat runoff from Apple Valley that has historically discharged directly to Keller Lake. The project appears as a scheduled capital improvement in the Crystal and Keller Lakes Use Attainability Assessment completed by the Black Dog Watershed Management Organization (Barr, 2003) as well as the City's 2007 SWMP. Design of the project is currently underway.

Finally, comparative load estimates for the three time periods were also developed for the City's three nutrient-impaired waters, Long Lake, Farquar Lake, and Alimagnet Lake. The locations of the impaired lakes and the drainage areas associated with each are also shown in Figure ES-1. Through a joint effort with the City of Burnsville, a Lake Management Plan has been completed and is currently being implemented for Alimagnet Lake, as per the City's 2007 SWMP. Through a joint effort with the Vermillion River Watershed Joint Powers Organization, the City has developed and will submit a completed TMDL for both Long and Farquar Lakes to MPCA and USEPA in January 2008 for approval and subsequent implementation. These plans lay out a prudent and feasible, publicly supported strategy for meeting the intent of Minnesota's nondegradation rules for total phosphorus and total suspended solids and will be implemented to achieve the goals within each plan by 2020. Both efforts are called out as high priorities in the City's 2007 Surface Water Management Plan (SWMP). Runoff volume is expected to remain above the Baseline condition for each of the lakes. However, the increased volume is conveyed entirely through the storm sewer system and does not discharge to natural water courses where channel stability could be an issue. Thus, increases in runoff volume alone should not be considered as failing to meet nondegradation.



City of Apple Valley Nondegradation Review

Figure ES.1

Nondegradation Loading Assessment Summary for Project Area

Legend

- Project Area
- Inter-jurisdictional Discharge
- Tributary Drainage to Inter-jurisdictional Discharge
- Tributary Drainage to Nutrient-Impaired Water Bodies
- City Boundaries

Nondegradation Assessment Example Notation and Explanation

TP TSS Volume

10 Present Condition

20 Ultimate Condition

Example interpretation of the above nondegradation assessment symbol: Annual TP (total phosphorus) and TSS (total suspended sediment) loads (lbs) in the Present and Ultimate conditions are equal to or less than the loads in the Baseline condition. The annual runoff volume (ac-ft) in the Present and Ultimate conditions exceeds the volume in the Baseline condition by 10% and 20%, respectively.

0.25 0.125 0 0.25 0.5 Miles

N

Bonestroo

Apple Valley

A1. Introduction

A1.1 BACKGROUND

Minnesota nondegradation rules for all waters (MN Rules Ch. 7050.0185, adopted in 1987) specify conditions for discharges to surface waters that have occurred since 1988. They support state policy to protect Minnesota waters from significant degradation and to maintain uses, habitats, and water quality in these waters. These state policies were put in place in order to comply with the "antidegradation" part of the federal Clean Water Act passed in 1972.

Since 2003, most municipalities with a population between 10,000 and 100,000 have been required to secure from the Minnesota Pollution Control Agency (MPCA) a permit that authorizes discharge of stormwater from their municipal storm drainage system to waters of the state under the National Pollutant Discharge Elimination System (NPDES) program. These systems are known as Municipal Separate Storm Sewer Systems or MS4s.

In 2003, the MPCA was sued by the Minnesota Center for Environmental Advocacy over the State's alleged noncompliance with its nondegradation rules. As part of the court action, the Minnesota Court of Appeals ruled specifically that the permit issued by MPCA to conditionally authorize stormwater discharge from an MS4 had to address nondegradation requirements.

To comply with the court ruling, the MPCA revised the NPDES permit program in 2006 to require 30 municipalities who own and operate MS4s to complete "Nondegradation Reviews" that will enable the MPCA to determine if nondegradation rules are being met. MPCA determined these 30 MS4s as most likely to have expanded stormwater discharges to surface waters, based on assessments of those entities':

- population changes since 1989,
- current population, and
- projected population growth to 2020.

Apple Valley is one of the 30 permitted MS4s to which this Nondegradation Review requirement applies.

The Nondegradation Review includes conducting a pollutant loading assessment, writing a nondegradation plan, and, if necessary, modifying the City's Storm Water Pollution Prevention Program (SWPPP) to address the findings of the assessment and to incorporate any changes proposed in the plan. The MPCA will consider a permittee to be in compliance with the nondegradation rules if Baseline (1988-1990) loading levels of stormwater runoff volume, total phosphorus (TP), and total suspended solids (TSS) can be achieved, either through existing facilities, programs, and policies or through proposed modifications to these. The Baseline condition is used as the "yardstick" to measure compliance unless mitigating environmental, economic, and social factors make additional control measures unreasonable.

A1.2 PURPOSE AND SCOPE

The purpose of Part A – Nondegradation Loading Assessment is to present the methods used and results for the pollutant loading assessment portion of the Nondegradation Review requirements of the NPDES MS4 General Permit administered by the MPCA.

Part A – Nondegradation Loading Assessment includes the technical modeling information used to quantify the City's stormwater loadings, as well as the supporting information about modeling methods and results. Specifically, the report is organized into the following sections:

- Modeling Approach, including documentation of model algorithms, limitations of the model, Quality Assurance/Quality Control (QA/QC) procedures, and model input requirements.
- Modeling Results for all waters that identify key changes in land use, as well as average annual TP, TSS, and runoff volume for the Project Area as a whole and for each of the seven inter-jurisdictional discharges and three impaired waterbodies for three time periods (i.e., Baseline, Present, and Ultimate). See Figure A3.1 in Section A3.3 for locations of these features.

The intent of the Nondegradation Review is to provide defensible, calculated values that illustrate the degree to which the City of Apple Valley's stormwater management program achieves compliance with the nondegradation rules, utilizing procedures outlined in the MS4 General Permit. This was accomplished by first calculating the estimated pollutant loads for the land use conditions at three time periods: Baseline (1990), Present (2005), and Ultimate Development (2020). Next, the treatment effect of various stormwater best management practices (BMPs) was calculated to determine how pollutant load reductions compared to Baseline levels.

A1.3 WATER QUALITY PRIMER

It is widely recognized that pollutant loads can vary dramatically for any given land use as a result of time of the year, climatic conditions, human activities, or other variables such as soils, slope, and vegetative cover. Pollutant loading to receiving waters is expressed in terms of mass per unit time. In this report, loads are presented as pounds per year and referred to as annual load. Pollutant load is the product of pollutant concentration and total runoff volume.

For general watershed loading analyses of the type acceptable for the Nondegradation Review requirements, a static pollutant concentration (termed Event Mean Concentration or EMC) is chosen from a range of values to reflect typical runoff quality for a specific type of land use for an annual analysis period. For total phosphorus, annual EMC values range from 200-250 parts per billion (ppb) for runoff from relatively undisturbed land (forest, grassland, etc.) to as high as 300-600 ppb for modified landscapes supporting land uses such as residential, commercial, or agricultural row crop.

The runoff volume applied to the pollutant concentration to generate a load estimate is dependant on rainfall depth and land use characteristics of the watershed. A volumetric runoff coefficient (Rv) is used to represent the proportion (expressed as a decimal fraction) of precipitation that results in runoff for each type of land use. Runoff coefficients vary according to the amount of impervious cover present. Areas of high impervious cover prevent rainfall from soaking into the ground, increasing runoff volume and generating high runoff coefficients. Areas of low impervious cover and well established vegetation result in lower surface runoff volumes, and consequently, lower runoff coefficients. Annual volumetric runoff coefficients vary from between 0.05 and 0.1 for well vegetated, undisturbed land uses (forest, grassland, etc.) to upwards of 0.3 to 0.7 for high density residential and commercial/industrial development with high impervious coverage. Agricultural land uses like row crops often fall between these two ranges, though the values can be highly variable depending on the soil, slope, extent and type of tile drainage, crop type, and other factors.

A2. Description of Modeling Approach

A2.1 SELECTED MODEL DOCUMENTATION

The PONDNET model was selected for use in conducting the loading assessment for Apple Valley's Nondegradation Review. While there are a number of more sophisticated urban and non-urban water quality models available, PONDNET was selected for the following reasons:

- PONDNET is designed to estimate runoff volume and TP loads over a wide range of urban and non-urban land uses.
- PONDNET is relatively easy to use, understand, and review.
- It has credible standing within the professional community for water resources planning and analysis applications.
- Reliable values for model inputs are relatively easy to obtain for Minnesota.
- PONDNET can assess the influence of natural and constructed wetlands and wet detention basins (e.g., ponds) on attenuation of phosphorus pollutant loads. Further, it can also be adapted to account for the influence of other types of BMPs, such as street sweeping, infiltration, and the phosphorus fertilizer ban.

The PONDNET model was developed by William W. Walker, Jr, an Environmental Engineer from Massachusetts (http://wwwalker.net/). The spreadsheet-based model employs algorithms established by Walker (1987) to estimate the retention of TP in wet detention basins. The algorithms are based on empirical relationships from EPA's Nationwide Urban Runoff Program (NURP) that describe both settling of the particulate fraction of phosphorus and biological uptake of the dissolved fraction during quiescent times between storm events on an annual time scale.

The following formulas are utilized in the PONDNET model to describe both settling and biological reaction rates. These equations are combined to produce the retention coefficient for mixed basins to describe the fraction of TP removed from surface water runoff. The key algorithms are:

$$R_p = 1+[1-(1+4N_r)^{0.5}]/(2N_r) = \text{Retention Coefficient (Mixed System), where}$$

$$N_r = K_2 P_i T = \text{Dimensionless Reaction Rate, and}$$

$$K_2 = 0.056 Q_S F_0^{-1}/(Q_S+13.3) = \text{Second Order Decay Rate } (m^3/mg\text{-}yr)$$

The symbol definitions are as follows:

F_0 = inflow ortho phosphorus/total phosphorus ratio
T = mean hydraulic residence time (years) = pool volume/mean outflow rate
Q_S = mean surface overflow rate = mean outflow rate/surface area
P_i = inflow total phosphorus concentration (mg/m^3) = total phosphorus loading/mean outflow rate

As part of its development, the model was tested twice: the first time when developed using 20 ponds from a study completed by Clasen and Bernhardt (1980) and the second time in a study completed by Walker (1987). Overall the model performs quite well, with mean squared errors less then 4%. This means the estimated values predicted by the model are within the 90% confidence interval for the observed values for 96% of the ponds analyzed in the studies.

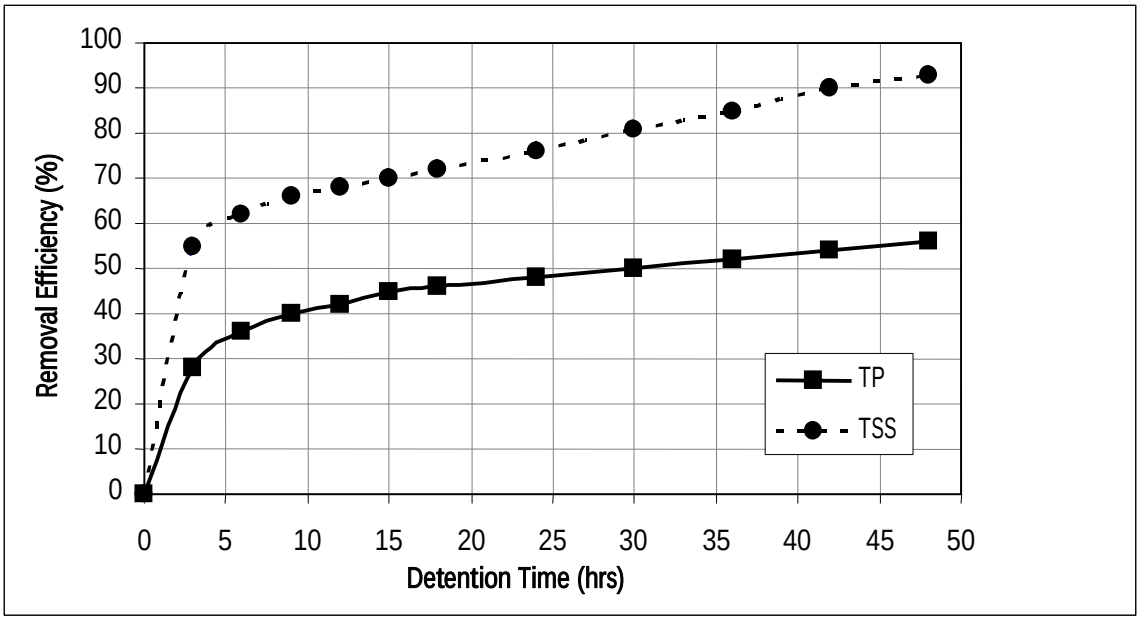
A2.2 MODEL LIMITATIONS

As with any model, PONDNET also has limitations, which include the following:

- The focus of the model is on TP and water volume loadings, not TSS.
- The model is designed primarily to assess the impact of settling basin networks on phosphorus loads, and does not have explicit routines to estimate the impact of non-pond BMPs.

To address the first limitation, a module to calculate and track TSS loads through the modeled system was developed for PONDNET. Using an accepted relationship between the removal efficiency of TP and total suspended sediment in wet detention basins (shown below in Figure A2.1), a look-up table was incorporated into the PONDNET spreadsheet model to arrive at an estimated TSS removal efficiency from the modeled TP removal efficiency for the pond.

Figure A2.1 - Stormwater Pollutant Removal Efficiencies related to Detention Time (Adapted from OWML,1983)



Similar to the TP budget in PONDNET, TSS runoff loads from the immediate watershed discharging directly to the pond (direct drainage) and upstream watershed (indirect drainage) are combined to estimate the TSS inflow to a pond. The TP removal efficiency calculated in PONDNET is used to select the TSS removal efficiency from Figure A2.1. The product of TSS inflow load and removal efficiency provide for net sedimentation, which, when subtracted from TSS inflow load, results in TSS outflow load from a given pond. The PONDNET model ensures that the TP-to-TSS removal efficiency relationship is only applied to wet detention BMPs by utilizing an "if-then" MS Excel function to confirm that the mean depth is greater than zero.

Informal review meetings were held with MPCA staff on May 3, 2006 and June 29, 2006 to review this enhancement to the model and obtain feedback on whether it established an adequate technical basis to provide a credible TSS load calculation capability for PONDNET for the nondegradation loading assessment. MPCA staff indicated the calculation strategy was reasonable and appeared adequate for the nondegradation pollutant loading analysis.

Regarding the second limitation, methods were developed to be able to include treatment effects of certain BMPs in addition to the wet detention BMPs in the model. Those additional BMPs could include street sweeping, infiltration, and P-fertilizer use reduction. The quantification of the treatment effects would rely on supplemental technical analyses outside the modeling framework, but changes to the model can be made to account for the impact in a transparent way. Currently, the treatment offered by P-fertilizer use reduction is the only additional BMP incorporated into the model, and technical documentation for this application is presented in Section A2.10.

A2.3 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

The PONDNET model is relatively easy to use and understand, but requires a good understanding of the operation of Microsoft's Excel spreadsheet software program. Modifications made to allow automated incorporation of GIS-based land use input do make the model more complex to use, however. It is important to follow a basic set of QA/QC procedures to help assure that the automated functions are working properly and that the model is functioning as intended. They are as follows:

- Make sure the season length is set at 1 year across all columns.
- Make sure that season precipitation is the correct value for the location and is referenced correctly across all columns.
- Check pond inputs, especially with regard to watershed area draining directly to the pond, pond area at the normal water elevation, and pond "wet" volume at the normal water elevation.
- Make sure all watershed areas draining to a given pond or evaluation point are connected as appropriate (that is, the columns are linked in the spreadsheet).
- Check that each watershed's land use composition adds up to 100%.
- Check general accuracy of runoff total phosphorus, runoff total suspended solids, annual volumetric runoff coefficient, and dissolved/total phosphorus ratio for each land use in the Loading Parameters section of PONDNET. The values calculated in this section of PONDNET act as inputs to many other equations in the spreadsheet.
- Make sure that the derived unit exports (in lb/ac/yr) in the loading parameter table are calculated correctly based on total phosphorus and total suspended solids concentrations, volumetric runoff coefficient, and the annual precipitation amount.

- Confirm that the TP and TSS concentrations, the volumetric runoff coefficient, and the dissolved-to-total phosphorus ratio are consistent for each land use category among the three conditions (i.e., Baseline, Present, and Ultimate) for the loading assessment.
- Verify that any significant changes in runoff volume, TP, or TSS loads at the load calculation points among the Baseline, Present, and Ultimate conditions for the load assessment can be attributed to land use changes. In virtually every case, the magnitude and direction of change should be related to how one or more significant variables in the model were modified to represent changed runoff quality or quantity for the time period of interest.
- The number of listed subwatersheds in ArcGIS' report of land use types per subwatershed should equal the number of columns in PONDNET, because each column in PONDNET represents one subwatershed in the system. If the number of columns is different than the number of subwatersheds defined in the land use mapping, then lists from each source will need to be crosschecked to identify and correct the cause of discrepancy.
- All functions that search a database of values need to be checked to ensure that they are searching the full range of that database. For instance, PONDNET contains functions that look up values in the reference tables on land use and water bodies. When information is added to these tables, the number of columns or rows increases, changing the range of the table. The reference to the table in the equation does not automatically change when the table is changed, and therefore needs to be adjusted.
- Verify that the selected data inputs (e.g., pollutant concentrations, runoff coefficients, etc.) were correctly entered into the model with the proper units.
- Sum area for each land use category and compare it to the Project Area total or subwatershed total for each time period.
- An experienced staff person other than the modeler provided an independent review of the model inputs and outputs to verify the reasonableness of the model and its results.

A2.4 OVERVIEW OF DATA REQUIREMENTS

Stormwater runoff characteristics and receiving water quality is affected mainly by the size and land use composition of the contributing watershed and the performance of any BMPs used to decrease pollutant loading from that watershed. Stormwater pollutant loads can be estimated from:

- A pollutant Event Mean Concentration (EMC) (variable by land use)
- A runoff coefficient (Rv) for each identified land use
- A representative annual average precipitation amount

Contributing watershed areas are determined by the topography and the natural and constructed conveyance infrastructure in the area draining to the receiving water or point of interest. BMP performance is determined by the size and land use characteristics of the service area draining to the BMP as well as the size and operation of the BMP itself. Quantifying the effect of these key variables is important to credibly model any system. The following sections describe how this information was generated for the nondegradation loading assessment.

A2.5 LAND USE-DEPENDENT INPUT DATA

A2.5.1 OVERVIEW OF LAND USE-DEPENDENT VARIABLES

Pollutant loads are the product of runoff volume and pollutant concentration (represented as an event mean concentration or EMC). Runoff volume is a function of precipitation depth and a runoff coefficient (Rv). Both runoff coefficients and pollutant concentrations in runoff vary with land use type. The runoff coefficients and runoff pollutant concentrations for TP and TSS assigned to each land use category were held constant throughout the PONDNET modeling for each time period.

The over-riding consideration in developing input parameters reflective of each land use was to generate unit load estimates within accepted literature value ranges for Minnesota and the upper Midwest. For agricultural row crop and low density residential, it was also appropriate to reflect the general view among knowledgeable water quality professionals that raw TP export rates for agricultural row crops with conservation practices are slightly/moderately lower than raw export rates for residential. If either the loading rate and the EMC or the loading rate and the Rv for a given land use were available, the missing value could be derived arithmetically through the following relationship:

$$EMC \times P \times Rv \times 2.71 = \text{Pollutant Loading Rate}$$

Where:

EMC = Event Mean Concentration of TP or TSS in runoff from the land use, expressed as mg/l

P = Average annual precipitation depth for Apple Valley expressed in feet (34.62 inches or 2.89 feet)

Rv = Volumetric runoff coefficient expressed as a decimal fraction to represent the proportion of precipitation that results in surface runoff over an average year

2.71 = a unit conversion factor

Pollutant Loading Rate = annual load for TP or TSS for the land use, expressed in lbs./acre/yr

The two land use classifications that have the greatest influence on the model for this analysis are row crop agriculture and low density residential areas, because they exhibit the greatest change in acreage throughout the nondegradation timeframe within the Project Area. The following section presents the values assigned to each land use category. The subsequent sections provide more detail to support the selection of the data inputs for the urban and non-urban land uses.

A2.5.2 LAND USE-DEPENDENT VARIABLES FOR PONDNET

For each of the land use categories within the Project Area, a combination of EMCs and Rv values were selected, which resulted in a representative average annual unit area load. These values are critical to the modeling results and are presented in Table 2.1.

Table 2.1 - PONDNET Input Values used for the Apple Valley Loading Assessment

Land Use Category	Impervious Coverage[1] (%)	Rv (fraction)	TP EMC (ppb)	TP Loading Rate[2] (lbs/ac/yr)	DP:TP Ratio (fraction)	TSS EMC (ppm)	TSS Loading Rate[2] (lbs/ac/yr)
Row Crop Agriculture[3]	n/a	0.14	540▲	0.59□	0.2	163▲	178□
Farmstead	10	0.09	350	0.26	0.5	216	158
Pits and Quarries	0	0.00	0	0	0.0	0	0
Low Density Residential[4]	30	0.22	450•	0.76‡	0.3	140•	235‡□
Medium Density Residential	45	0.31	450•	1.08‡	0.3	140•	335‡
High Density Residential	65	0.43	450•	1.50	0.3	140•	468□
Neighborhood Services	65	0.43	350†	1.17‡	0.3	140	468‡□
Commercial	65	0.43	350†	1.17‡	0.3	140	468‡□
Industrial	80	0.52	350†	1.42‡	0.3	140	568‡□
Institutional	50	0.34	350	0.92	0.3	140	368
Mixed Use	65	0.43	350†	1.17‡	0.3	140	468‡□
Park	10	0.09	250	0.18	0.3	216	158
Open Space	n/a	0.05	200•	0.08□	0.6	216•	84
Golf Course	10	0.09	550	0.40	0.7	216	158
Right-of-Way	40	0.28	400	0.86□	0.3	140	302
Minnesota Zoo	15	0.12	250	0.24	0.3	216	209

[1]Non-urban land uses with "n/a" for impervious coverage signify the absence of the following relationship between impervious coverage and runoff coefficient: Rv=[0.607*Impervious Fraction]+0.033 (See Section A2.5.3)

[2]All loading rates based on average annual precipitation depth (P) of 34.62 inches/year. Source: Minnesota Climatology Working Group, 1975-2005, Stations 217107 Rosemount and 212737 Farmington.

[3]Dominant non-urban land use.

[4]Dominant urban land use.

† Bannerman, R.T., D.W. Owens, R.B. Dodds and N.J. Hornewer. 1993. Sources of Pollutants in Wisconsin Stormwater. Wat. Sci. Tech. 28: 241-59.

‡ Bannerman, R.T. 2001. Presentation at North American Lake Management Society Workshop on Stormwater Management Practices to Protect Lakes. November 6, 2001. Madison, WI

▲ Cave, K., T. Quasebarth, and E. Harold. 1994. Rouge River National Wet Weather Demonstration Project. Technical Memorandum – Selection of Stormwater Pollutant Loading Factors.

• Minnesota Pollution Control Agency (MPCA). 2000. Protecting Water Quality in Urban Areas. Best Management Practices for Dealing with Stormwater Runoff from Urban, Suburban, and Developing Areas of Minnesota.

□ University of Wisconsin Extension. 1995. Urban Runoff: How Polluted Is It? 6 pgs.

The values themselves were derived using a combination of detailed site specific study results from the upper Midwest, generally accepted literature values from credible sources, knowledge of local conditions, and professional judgment. More detailed explanations of how the load values were determined are presented in the following four sections.

Following are brief descriptions of each land use category modeled in this Nondegradation Review:

- Row Crop Agriculture – the dominant non-urban land use; primarily corn and soybean fields.
- Farmsteads – primarily farm houses and accompanying out-buildings; at a density of 1 unit/acre or less.
- Pits and Quarries – current or past sand and gravel mine sites.
- Low Density Residential – the dominant urban land use; includes mostly single-family, detached homes; at a housing density range of 0-6 units/acre.
- Medium Density Residential – includes duplexes, triplexes, fourplexes, trailer homes, twinhomes, and townhouses at a density range of 6-12 dwelling units per acre.
- High Density Residential – includes senior housing, apartments, and other multiple family housing at a density greater than 12 dwelling units per acre.
- Neighborhood Services – gas stations, small strip malls, etc.
- Commercial – shopping centers, offices, hotels, restaurants, etc.
- Industrial – factories and warehouses.
- Institutional – includes places of worship, medical care facilities, and educational facilities (e.g., K-12 schools, colleges, and universities).
- Mixed Use – a mix of industrial, commercial, and medium-high density residential land uses; loading rates similar to Commercial.
- Park – maintained open areas, including: natural resource area parks, cemeteries, and recreational parks other than golf courses.
- Open Space – low maintenance open areas, including: forest, grassland, and prairie.
- Golf Course – public and private golf courses.
- Right-of-Way – major right-of-ways, such as interstate, state divided highway, and county roads.
- Minnesota Zoological Gardens – area owned and operated by the Minnesota Zoological Gardens; loading rates similar to Park.

A2.5.3 Urban Total Phosphorus Loading Rates

For urban land uses, the volumetric runoff coefficient was derived from the impervious coverage using a relationship developed as part of the NURP study (Beduhn,1994) as reflected by the following equation:

$$Rv = (0.607 \times \text{Impervious fraction}) + 0.033$$

This relationship was used to calibrate the City of Eagan's PONDNET model to the Fish Lake watershed based on monitoring data collected as part of a Phase 1 diagnostic feasibility study conducted under the MPCA's Clean Water Partnership Program (City of Eagan, 1994). Use of the equation generated a PONDNET model that was able to represent water and phosphorus loads to the lake within 10% of monitored values.

For urban land uses, EMCs for TP generally decrease as impervious coverage increases as documented in numerous references for the upper Midwest (MPCA, 2000; Bannerman, et. al. 1993; University of Wisconsin Extension, 1995; Cave, et. al. 1994). However, significantly higher volumetric runoff coefficients

associated with higher impervious coverage more than compensate for the lower EMCs, resulting in higher overall loads as urban land use intensity increases. The urban phosphorus loads used as inputs to this model for Apple Valley's Project Area are within accepted literature loading rates for this part of the country and appear reasonable relative to each other, with land uses having higher impervious coverage generating higher TP loads.

A2.5.4 Non-Urban Total Phosphorus Loading Rates

Reference EMC and Rv values for non-urban uses are less commonly documented in stormwater literature than EMC and Rv values for urban land uses. For agricultural row crop values, an EMC of 540 ppb was selected based on a detailed field monitoring study aimed at developing credible EMC values for three row crop-dominated agricultural subwatersheds in Michigan (Cave, et al. 1994). This reference was a credible source for agricultural values for the following reasons:

1. The Cave study was the most comprehensive, field-based monitoring study found for derivation of EMCs for upland runoff in crop-dominated watersheds in the upper Midwest.
2. The Cave study covered an area with a climate similar to that of the Apple Valley area.
3. Mean annual precipitation in the reference agricultural watersheds was 31.6" per year, close to the approximately 34.62" per year for the Apple Valley area. Further, precipitation totals for the years in which monitoring data was collected to support development of agricultural EMCs was near the long-term mean, with 36.7" and 29.7" of precipitation recorded at a nearby monitoring station in 1991 and 1992, respectively.
4. Hydrologic Group B soils cover between 79 and 95% of the three monitored subwatersheds, closely matching the soil coverage in Apple Valley.

The Rv value for agricultural row crop was the most difficult variable to select because of the wide range of conditions inherent in this land use that can affect runoff (soils, topography, tile drainage, tillage practices, crop cover, etc.). An Rv value of 0.14 was selected as being appropriate, based in part on the fact that this value produces a unit load rate (0.59 lbs/ac/yr) for this land use. This unit load rate is about 20% below that for low density residential (0.76 lbs/ac/yr), which reflects the general view among knowledgeable water quality professionals that raw TP export rates for agricultural row crops with conservation practices are slightly lower than raw export rates for residential.

Development of EMCs and Rv values for other non-urban land uses were stepped down from those described above for row crop agricultural values, reflecting either lower runoff volumes because of continuous plant cover, lower EMCs due to reduced sediment transport and supplemental nutrient additions, or both.

MPCA's manual Protecting Water Quality in Urban Areas (MPCA, 2000) provides a TP EMC of 230 μg/L for open space/non-urban land use. The University of Wisconsin Extension (UWEX,1995) suggests a loading rate of 0.07 lb/ac/yr for open space. If the pollutant loading rate equation in Section A2.5.1 and Apple Valley's average annual precipitation depth of 34.62 inches are applied, an EMC of 178 μg/L is calculated. Therefore, the TP EMC selected for Apple Valley's Nondegradation Review is 200 μg/L, a composite of the two cited EMC values.

A2.5.5 Urban Total Suspended Sediment Loading Rates

Representative EMCs for TSS were researched for key land uses and the formula presented previously relating EMCs and Rv values to pollutant loading rates for each land use was used.

The principle source for TSS EMCs for urban land uses was MPCA's manual Protecting Water Quality in Urban Areas (MPCA, 2000). The manual provides a mean TSS concentration of 140 mg/l based on NURP data for runoff from urban residential land uses. The resulting loads are shown in the preceding Table 2.1 and reflect the strong influence of the Rv values that represent each land use. TSS loading rates vary from 235 lbs/ac/yr for low density residential (0-6 units/ac) to 468 lbs/ac/yr for high density residential (12+ units per acre). These calculated Apple Valley values compared favorably with results of a study in Madison, WI by Bannerman (2001), where an average annual TSS loading rate was estimated to be 212 lb/ac/yr for a mature residential development (3 units/ac). In the same study, Bannerman (2001) found the average annual loading rate of 496 lb/ac/yr for commercial development. This value is close to the TSS loading rate of 468 lbs/ac/yr for the neighborhood services, commercial, and mixed land uses in Table 2.1.

A2.5.6 Non-Urban Total Suspended Sediment Loading Rates

For agricultural land uses, Cave, et al. (1994) was again utilized in the absence of Apple Valley-specific information. An EMC for TSS of 163 ppm was derived through the field monitoring of three agricultural subwatersheds cited in the Rouge River watershed project in southern Michigan and mentioned previously in this report. The open/non-urban value of 216 mg/l cited in the MPCA's manual (2000) was used as the EMC for other non-agricultural land uses dominated by pervious coverage, such as farmstead, park, open space, and golf course.

A2.6 PRECIPITATION

An average annual precipitation of 34.62 inches was used for the PONDNET model throughout the entire nondegradation timeframe. This value of 34.62 inches was calculated from long-term annual precipitation data (1975-2005) provided by the Minnesota Climatology Working Group (2007) and collected at stations 217107 and 212737, located in Rosemount and Farmington, respectively, which are located within 4 miles of Apple Valley's city center. Together, volumetric runoff coefficients and annual precipitation depth applied to a specific area result in total annual runoff volume.

A2.7 PROJECT AREA AND DRAINAGE DISTRICT BOUNDARIES

The geographical limits of the Project Area were defined by Apple Valley's city limits. The area defined and modeled is approximately 11,200 acres, or approximately 17.5 square miles, and will be called the "Project Area" for the remainder of this report. The Project Area boundary is shown on all figures within the report and in Appendix A.

The City of Apple Valley's Surface Water Management Plan (SWMP) (Bonestroo, 2007) divides the City into the following six major drainage districts as follows:

- AL (Alimagnet Lake)
- BD (Black Dog)
- EVR (East Vermillion River)
- KL (Keller Lake)
- LL (Lac Lavon)
- WVR (West Vermillion River)

These SWMP drainage districts were used as a starting point from which tributary drainage areas were created for each load estimation point of the nondegradation loading assessment (i.e., evaluation point). A discussion of how these districts relate to the load estimation points used to present the modeling results is presented in Section A.3.2.

The City of Apple Valley opted to utilize a routing method rather than an overlay method to complete its Nondegradation Review. In a routing method, the model directs loads generated within specific areas along conveyance routes and through treatment features in a way which is intended to represent what actually happens "on the ground". Accordingly, drainage district boundaries and their interconnectivity need to be identified. Apple Valley began creating a PONDNET model in 2004 with the revision of its Surface Water Management Plan. Much of the PONDNET model's data was populated using the City's water quantity model, HydroCAD. The PONDNET and HydroCAD models both utilize the same naming convention for all subdistricts and stormwater basins. Subdistricts and stormwater basins are named and numbered to correspond with their drainage district (e.g. EVR-44). The complete subdistrict coverage and nomenclature information for the City is available electronically in a GIS format, but is not presented within this report. However, the subdistrict and pond nomenclature is expressed in the model output data contained in Appendix C.

A2.8 WET PONDS/ DETENTION BASINS

Water bodies with standing water have historically shown to be effective at treating runoff for pollutants such as TP and TSS. These can include natural or constructed ponds, lakes, reservoirs, or wetlands. Constructed, stormwater "wet" ponds have been the primary BMP used by local governments, including Apple Valley, over the last 10-15 years to improve stormwater quality. In general, wet detention BMPs reduce loadings of pollutants by slowing the flow rate of stormwater so that a portion of the particles carried in suspension or along the bottom of the pipe or channel entering the pond settle out before the water leaves the pond through the outlet. They can also remove dissolved pollutants (especially nutrients like phosphorus) through uptake due to biological activity in the ponds themselves. Thus, a single well-designed and constructed pond of the type required by the City of Apple Valley to mitigate the impacts of new development has the capacity to remove 40-50% of the TP load it receives over the course of a year and 60-80% of the TSS load. The treatment provided by wet ponds is by far the dominant influence in mitigating pollutant loads carried by urban stormwater in Apple Valley and PONDNET's ability to account for this treatment effect is one reason it was chosen for this analysis. Forty-four wet detention basins were constructed between 1990 and 2005, with a cumulative area of about 60 acres and a cumulative wet volume storage of about 235 acre-feet.

The key inputs needed by the PONDNET model to account for attenuation of pollutant loads by wet detention BMPs that have been incorporated into the City's stormwater management system are the surface area and standing water "pool" volume of the pond at normal water level. For the majority of natural and constructed wet detention BMPs, this data was extracted from the City's existing PONDNET model and transferred into the nondegradation loading assessment model. For constructed wet detention BMPs, the majority of surface area and wet volume data was generated from grading plans and as-builts. Other wet volumes and surface areas were obtained through aerial photography analysis and field assessment. The stormwater basin coverage is available electronically from the City.

A2.9 LAKES

The following five lakes lie wholly or partially within the Project Area:

- Alimagnet Lake
- Long Lake
- Farquar Lake
- Cobblestone Lake
- Lac Lavon

Drainage from the Project Area also ultimately reaches Keller and Crystal Lakes in Burnsville.

For the nondegradation loading assessment, no treatment is accounted for in lakes. This is accomplished by "zeroing out" the wet volume and surface area of the lake so that whatever modeled loads enter the lake leave it.

A2.10 PHOSPHORUS FERTILIZER BAN

A study of suburban residential watersheds in Maple Grove and Plymouth in 2001-2003 demonstrated a potential to reduce phosphorus export from residential areas by restricting the use of phosphorus-containing fertilizer (Three Rivers Park District, 2005). This study along with several analyses of available phosphorus in Twin Cities Metropolitan Area lawns (Rosen et al., 1998; Rehm and Schmitt, 1993; Schultz, 1995; Grava and Fenster, 1979; Barten, 1994; Shover, 1997; and Swenson, 1997), convinced the Minnesota Legislature to consider banning the use of phosphorus-containing fertilizer.

In 2002, the Legislature passed a law that banned the use of lawn fertilizers containing phosphorus in the Twin Cities Metro Area effective January, 2004, and then expanded the ban to be effective statewide in January 2005 (MDA, 2005). However, phosphorus fertilizer may be applied upon proof from a soil test that supplemental phosphorus is necessary.

For purposes of the loading assessment, conditions and results of the watershed study were compared against Apple Valley's practices to determine appropriate phosphorus load reductions for each of the three evaluation years (1990, 2005, and 2020).

The phosphorus loading in runoff from watersheds in Plymouth, where 71% of the residents did not apply phosphorus-containing fertilizer, was 12-16% less than from watersheds in Maple Grove, where only 26% of the residents applied phosphorus-free fertilizer. This reduction potential is limited to precipitation events greater than 2 cm (approximately ¾"), the amount at which runoff from pervious surfaces typically occurs. Rainfall events less than 2 cm result in runoff from impervious surfaces only, where no fertilizer (whether containing phosphorus or not) is applied, and therefore, no reduction in phosphorus in runoff can be realized for these smaller events. Rain events greater than 2 cm during the 2001-2003 time period accounted for 14% of annual rain events, yet 80% of annual runoff volume (Three Rivers Park District, 2005). Thus, the annual reduction in phosphorus export is 80% of 12-16%, or 9.6-12.8%.

The City of Plymouth instituted a phosphorus-free fertilizer ordinance in 1995, six years prior to the watershed study. The City informed the residents of the ordinance through a public education campaign where short, catchy reminders were placed in at least four city newsletters per year. For a few years

following the establishment of the ordinance, the City would feature water quality solely in one City newsletter offering more in depth information about the impacts of phosphorus-containing fertilizer on valued water resources.

Apple Valley, along with most cities, had little to no emphasis on restricting phosphorus-containing fertilizer in 1990. Restrictions on phosphorus-containing fertilizer use began in Apple Valley in 2004 with the metro-wide ban. Therefore, without at least a five-year time period for the effects of the ban to take place, a reduction in phosphorus for the Present condition could not be modeled in the loading assessment. It is assumed that residents will be able to change behavior by 2020, allowing for the maximum reduction in phosphorus (12.8%, rounded to 13%). Therefore, the following phosphorus load reductions were applied to all residential land use types in the loading assessment:

- 1990 and 2005: 0%
- 2020: 13%

A2.11 STORMWATER MANAGEMENT PRACTICES NOT MODELED

The loading assessment for the City of Apple Valley does not account for the benefits of numerous Best Management Practices (BMPs), in part because the level of detail of the analyses required to quantify their benefits is beyond the scope of this study. Never-the-less, it is important to recognize that there are benefits associated with these practices that have not been accounted for and, for that reason, the modeling conducted for the City's loading assessment may be more likely to over-estimate than underestimate values for the three parameters for the Present and Ultimate condition. Some notable BMPs that have not been specifically accounted in the loading assessment include the following:

1. **Street sweeping.** Since the early 1990's, the City of Apple Valley has a program that utilizes mechanical sweepers to clean all streets three times a year. The City's street sweeping program has improved since the Baseline condition, and a vacuum sweeper is now routinely used to sweep high priority water quality areas at least once per year. Because conventional modeling tools do not show significant benefits for TSS and TP load reductions unless sweeping frequency is once per week or more, the effects of street sweeping were not accounted for in the loading assessment analysis and have not been included in the model. It should, however, be noted that the volume of material picked up by sweepers, especially during the spring sweeping, is substantial (hundreds of tons).
2. **Sump manholes.** The City also has over 1,500 sump manholes that were installed in the 1990's to remove course sediment and are cleaned annually. Sump manholes were typically installed where another BMP-type was not feasible due to space restrictions. The benefits provided by sump manholes have not been included in the water quality modeling.
3. **Infiltration features.** For the past 4 years, the City has required new development to infiltrate the first ½" of runoff where feasible and practical. Over 20 infiltration devices have been installed to serve new development, with service areas for the devices ranging from under an acre to over 5 acres. The impact of these devices on runoff volume for post-Baseline conditions was not specifically accounted.

Finally, the City's SWPPP contains a total of 52 BMPs. Only past installation of wet detention basins to serve new development, the past modification of several retro-fitted wet detention basins, the new and re-development policies to mitigate pollutant and runoff loadings for future development called for in the 2007 SWMP, two proposed future capital improvement projects called for in the 2007 SWMP, and the estimated future benefits of the phosphorus fertilizer ban are accounted for in the loading assessment. Nonetheless, many of the other BMPs have some benefit, even if it is not easily quantifiable, and their exclusion is another reason to consider the results of the loading assessment conservative.

A3. Loading Assessment Modeling Results

A3.1 INTRODUCTION

This section summarizes the results of the loading assessment for the City, accounting for pollutant loads at the City's inter-jurisdictional boundaries and impaired waters, both with and without BMPs. Load assessments used a routed modeling approach as described in Section A2.7. This section provides narrative summaries of the load estimates for each impaired water and inter-jurisdictional boundary, as well as for the Project Area as a whole.

A3.2 EVALUATION POINTS

The results of the modeling effort were organized and streamlined by focusing on the changes in water and pollutant loading at specific points in all of Apple Valley's surface water system, which are termed "evaluation points." The evaluation points were identified based on two categories:

- Inter-Jurisdictional Discharge
- Nutrient Impaired Waters within the City

Each evaluation point is shown with its tributary drainage area (ponded and direct) on Figure A3.1.

A3.2.1 INTER-JURISDICTIONAL DISCHARGE

The inter-jurisdictional discharges for the City of Apple Valley are listed below:

- Lakeville via Cobblestone Lake
- Lakeville via WVR-P443
- Burnsville via Lac Lavon
- Burnsville via Keller Lake
- Burnsville via Black Dog Watershed
- Eagan
- Rosemount

SWMP Drainage Districts EVR and WVR mostly discharge to Lakeville through Cobblestone Lake (EVR-P44) and WVR-P443, respectively. Districts LL and KL discharge to Burnsville through Lac Lavon and Keller Lake, respectively. District BD discharges to Burnsville at two points into the Black Dog Watershed. District AL discharges to Alimagnet Lake, which is situated on the border of Apple Valley and Burnsville, but the Lake's outlet is routed back into Apple Valley, and then on to Lakeville via WVR-P443. The area discharging to Eagan is mainly comprised of the Minnesota Zoological Gardens, Lebanon Hills Regional Park, and Valleywood Golf Course, and does not have any SWMP Districts assigned to it. Only a few small subdistricts in the SWMP District EVR discharge to Rosemount.

A3.2.2 IMPAIRED WATERS FOR NUTRIENTS

Three lakes located within Apple Valley were placed on the state 303(d) Impaired Waters list for excess nutrients in 2006. These lakes are listed below:

- Long Lake (eventual discharge to Lakeville via Cobblestone Lake)
- Farquar Lake (eventual discharge to Lakeville via Cobblestone Lake)
- Alimagnet Lake (eventual discharge to Lakeville via Pond WVR-P443)

These lakes' loads are evaluated individually, but are also included in Inter-Jurisdictional Discharge load evaluation points (noted in parentheses above), as they are located within those drainage areas.

A3.3 FIGURES AND APPENDICES

Figure A3.1 shows the areas where estimated loads are presented in this report, the seven inter-jurisdictional boundaries and three nutrient-impaired waters, as well as the Project Area.

Figures A-1 through A-3 in Appendix A at the back of this report show the following:

- Figure A-1 shows the Project Area land use distribution for the Baseline (1990) modeling condition.
- Figure A-2 shows the Project Area land use distribution for the Present (2005) modeling condition.
- Figure A-3 shows the Project Area land use distribution for the Ultimate (2020) modeling condition.

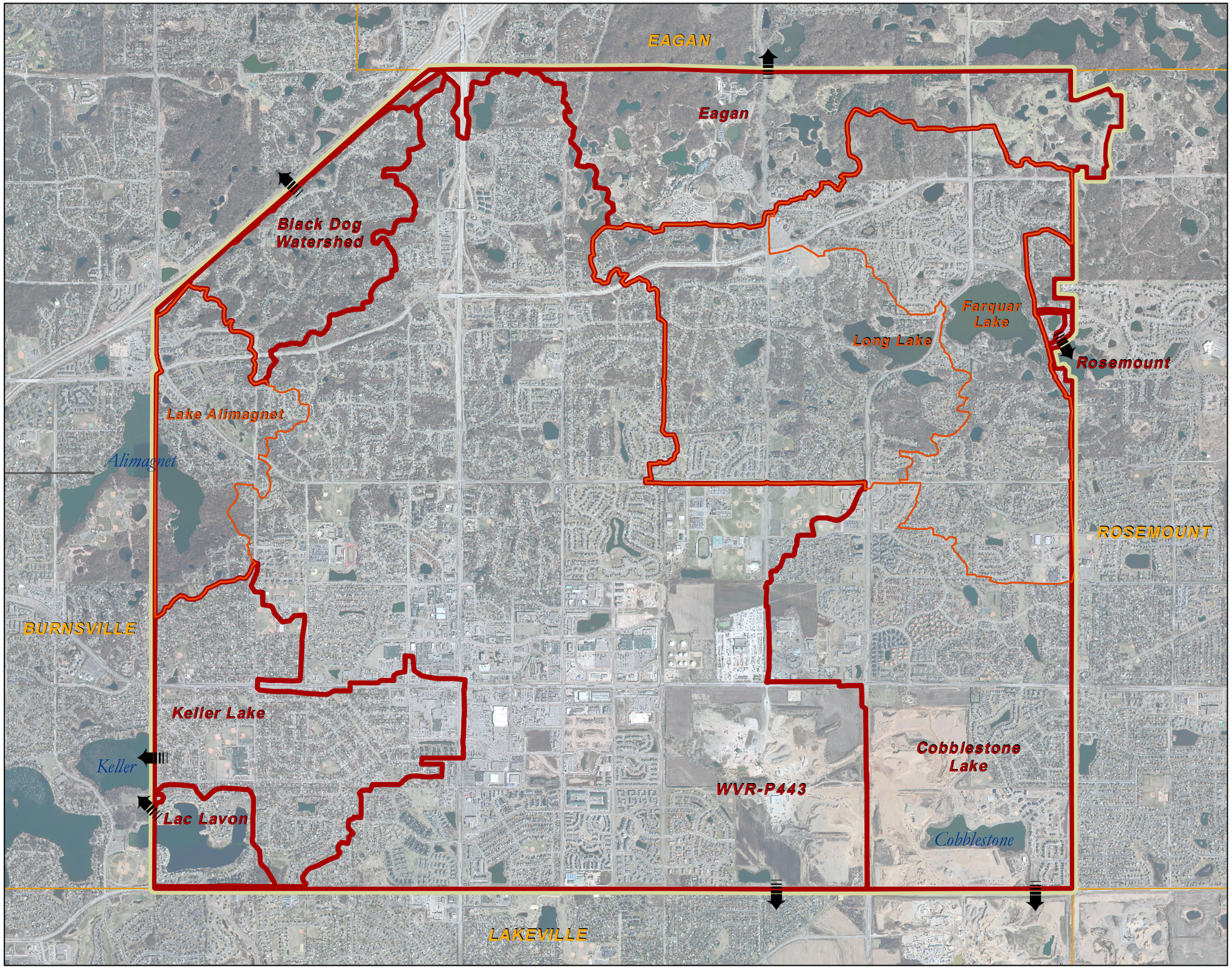
All figures in Appendix A also show the following:

- The City boundary (equivalent to the Project Area).
- The delineated tributary drainage areas to the 10 evaluation points, comprised of the seven inter-jurisdictional boundaries and the three nutrient-impaired waters.

Land use information for the Ultimate condition was supplied by the City of Apple Valley's Community Development and Planning Department. Land use information for the Present condition was generated by correcting the Ultimate condition land use data using 2005 aerial photographs. Land use information for the Baseline condition was generated by correcting the Present condition land use data using 1991 aerial photographs, having experienced City staff note developed areas in 1990, and checking preliminary and final plat dates of developing parcels in the 1991 aerial photographs.

Key data for all stormwater basins accounted for in the modeling are presented in Appendix B, organized by evaluation point drainage area. Appendix C contains the detailed model output for each drainage district for each of the three modeled conditions (i.e., Baseline, Present, and Ultimate). It is important to note that while the narrative summaries contained in this section concentrate primarily on a comparison of the loadings where inter-jurisdictional discharge occurs and at impaired water bodies, the detailed model output in Appendix C shows loadings for each subdistrict within each of the tributary drainage areas of the 10 evaluation points.

Finally, the detailed model output in the appendices differs from that presented in the text summaries. There are two reasons for this. First, slight differences occur due to rounding of numerical loads presented in the summary tables. The numbers in the summary tables for TP loading and runoff volume are presented to two significant figures and those for TSS loading to three significant figures. This is consistent with the number of significant figures for the EMCs, on which the unit loads for each parameter are based. Second, the numbers in the test summaries may be adjusted where there is a compelling to do so, such as where good monitoring data is available to provide a technical basis to make those adjustments. These adjustments occur infrequently and are explained thoroughly in the text when they are made.



City of Apple Valley Nondegradation Review

Figure A3.1

Nondegradation Loading Assessment Evaluation Points and Project Area

Legend

- Project Area
- Inter-jurisdictional Discharge
- Tributary Drainage to Inter-jurisdictional Discharge
- Tributary Drainage to Nutrient-Impaired Water Bodies
- City Boundaries

0.25 0.125 0 0.25 0.5 Miles

N

Bonestroo

Apple Valley

A3.2 OVERVIEW OF MODELING RESULTS FOR THE PROJECT AREA

A3.2.1 INTRODUCTION

This section presents a summary of the loading assessment for the entire 11,200-acre Project Area. Load estimates for the three time conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS, and runoff volume) are presented as a sum of the load estimates for the seven inter-jurisdictional discharges, each of which is discussed separately in the succeeding sections.

A3.2.2 LAND USE OVERVIEW

Table 3.1 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions for the Project Area.

Table 3.1 - Land Use Change Summary for the Project Area

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	1,531	265	-1,266	-83%	0	-1,531	-100%
Farmstead	144	13	-132	-91%	0	-144	-100%
Pits and Quarries	718	629	-89	-12%	0	-718	-100%
Low Density Residential	4,649	5,476	828	18%	5,669	1,021	22%
Medium Density Residential	216	458	241	112%	699	483	223%
High Density Residential	70	229	159	228%	239	169	242%
Neighborhood Services	17	33	16	93%	66	49	286%
Commercial	318	608	290	91%	669	350	110%
Industrial	137	198	61	44%	313	175	128%
Institutional	366	494	128	35%	493	127	35%
Mixed Use	0	0	0	0%	249	249	N/A
Park	301	402	101	34%	490	189	63%
Open Space	1,097	622	-476	-43%	536	-561	-51%
Golf Course	215	215	0	0%	215	0	0%
Right-of-Way	597	644	46	8%	644	46	8%
Minnesota Zoo	453	452	-1	0%	452	-1	0%
Water	357	451	95	26%	455	98	27%
TOTAL	11,188	11,188			11,189[2]		

[1]Change shown is compared to Baseline condition

[2]The Baseline condition total acreage is less than the other two conditions due to slight differences in the digital land use coverages.

There are several significant land use changes within the Project Area worth noting:

1. Under the Baseline condition, the dominant land use in the Project Area is low density residential (42% of the Project Area), followed by row crop agriculture and open space (14% and 10% of the Project Area, respectively).
2. The biggest land use change between the Baseline and Present conditions is a decrease of over 1,200 acres of row crop agriculture, and an increase of over 800 acres of low density residential.

Medium and high density residential, commercial, and industrial land uses increase by a total of about 750 acres. Open space land use decreases by 480 acres.

3. Row crop agriculture is expected to decrease only another 270 acres between the Present and Ultimate conditions. For the dominant urban land uses, low and medium density residential is expected to increase by a total of about 430 acres and industrial land use will increase by over 100 acres between the Present and Ultimate conditions. Mixed land use (comprised of medium-high density residential, commercial, and industrial) will increase by nearly 250 acres between the Present and the Ultimate conditions.
4. About two-thirds of the land use changes that will take place between the Baseline and Ultimate conditions have already occurred.

A3.2.3 Overview of Nondegradation Modeling Results

Table 3.2 summarizes the estimated differences in loadings for the three parameters for each of the three conditions for the Project Area.

Table 3.2 - Modeled Loadings for the Project Area

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	4,300	1,180,000	5,700
Present Condition	3,500	765,000	6,700 (≤6,500)
Ultimate Condition	3,400	757,000	6,800 (≤5,700)

Note: See Appendix C for the PONDNET Model's actual output and an explanation of the significant figures criteria application.

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of both TP and TSS in the Present and Ultimate conditions are less than the Baseline condition. This is due to the following factors:
    a. Most of the non-urban land that has been converted to urban land uses since the baseline condition was row crop agriculture, which has a relatively high TP and TSS loading rate.
    b. Between the Baseline and Present conditions, 44 wet detention basins were added in the Project Area to mitigate the impact of the conversion of non-urban land to urban uses. Cumulatively, the area of these detention basins is about 60 acres and the wet volume storage about 235 acre-feet. Modeling shows that each wet detention BMP generally achieves removal efficiencies of 35-50% for total phosphorus and 55-75% for total suspended solids.
    c. The Ultimate conditions TP and TSS loadings reflect:
        i. expected future impact of policies in the 2007 SWMP requiring, at a minimum, no-net-increase in TP and TSS loads for most new and re-development activities,
        ii. the anticipated impact of the Metro-area phosphorus fertilizer ban
        iii. the planned retro-fit installation of Whitney pond to treat existing runoff from Apple Valley prior to discharge to Keller Lake

Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current stormwater management program is sufficient to achieve nondegradation.

2. Modeled runoff volume for the Project Area (values shown outside the parentheses) increases moderately between the Baseline and Present conditions and slightly between the Present and Ultimate conditions. The main reason for the modeled difference between the Baseline and Present condition is that the historical conversion of non-urban to urban land uses has increased impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Further, most developments that have occurred since 1990 have not been required to install infiltration BMPs. Thus, no infiltration BMPs are included in the Present condition model, although some have been installed that serve a relatively small portion of the Project Area. The City has a requirement in its 2007 SWMP for most development and redevelopment to achieve no net increase of runoff volume, which has been applied in the Ultimate condition model.
3. The water volume loads in parentheses include the impacts of two additional factors. First, the results reflect the benefits of zero-discharge from Cobblestone Lake in the East Vermillion River drainage district to Lakeville based on monitoring data collected since 2001. The 2007 SWMP also calls for monitoring and protection of the infiltration capacity of Cobblestone Lake to help ensure that this zero-discharge condition will be maintained for the Ultimate development condition. Thus, the values in parentheses assume no change in runoff volume from the Baseline condition for the Present and Ultimate condition for the EVR drainage district. (Note: *The threshold of "no increase from the Baseline condition" is the minimum condition that must be met to achieve compliance with nondegradation. In all likelihood, the discharge from the EVR district is less now than it was under the Baseline condition because of the construction of Cobblestone Lake, but there is no readily available data to credibly document this difference. Therefore, for the purposes of meeting nondegradation, the table merely shows no net increase in water volume from the Baseline conditions*.) Second, the water volume loads for the Ultimate condition are adjusted to reflect a proposed diversion/infiltration of a portion of the outflow from the West Vermillion River drainage district at Pond WVR-P443. Sizing the diversion to meet nondegradation Baseline conditions for runoff volume from this drainage will be a consideration in the design of the project. Thus, the outflow volumes from the WVR District have also been reduced to Baseline conditions.

Table 3.3 shows a comparison of modeled Baseline and Present conditions with and without the BMPs that mitigate stormwater impacts associated with development activities since the Baseline condition within the Project Area. The "Without BMPs" scenario presents the modeled loads for the three parameters that would have resulted if there were no wet detention basins constructed between 1990 and 2005. Further, the Water Volume for the Present condition has been adjusted to account for the discharge condition for outflow from Cobblestone Lake in the EVR drainage district, as described above. An assessment of pollutant load reduction under the Ultimate condition (including the effect of the proposed diversion of outflow from Pond WVR-P443 and the creation of Whitney Pond) is not included, as this analysis is intended to estimate the impact of the City's past management practices.

Table 3.3 - Comparison of Baseline and Present Conditions Loads With and Without BMPs in the Project Area

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition[1]	4,300	1,180,000	5,700
Present Condition Without BMPs	5,000	1,410,000	6,700
Present Condition With BMPs	3,500	765,000	≤6,500
Loads Removed Under Present Condition[2]	1,500	645,000	≥200

[1] Where BMPs existed prior to 1990, the Baseline load accounts for that treatment.

[2] Loads Removed = Present Loading without BMPs – Present Loading with BMPs

Key findings are as follows:

1. The loading numbers for "Present Condition Without BMPs" show how pollutant loads would have increased without treatment.
2. Without the BMPs described above, Present TP and TSS loadings associated with development within the Project Area would have exceeded Baseline loadings by about 1,300 pounds/year (30%) and 230,000 pounds/year (19%), respectively. With the BMPs, loadings for these parameters for the Present condition are instead 800 pounds/year (19%) and 415,000 pounds/year (35%) below the Baseline condition, respectively.
3. Differences in water volume between the "Present Condition With BMPs" and "Present Condition Without BMPs" reflect the adjustment made to these figures so that water volume in the EVR drainage district meets the Baseline condition, as described above.

A3.3 INTER-JURISDICTIONAL EAST VERMILLION RIVER (EVR) DISCHARGE TO LAKEVILLE VIA COBBLESTONE LAKE

A3.3.1 INTRODUCTION

The drainage area of the inter-jurisdictional (EVR) discharge to Lakeville via Cobblestone Lake comprises about 3,500 acres (29%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). Cobblestone Lake discharges runoff from the EVR drainage district to Lakeville through a lift station that was installed in 2001. Since the lift station was installed in 2001, there have been no recorded discharges from the lift station to Lakeville (except for short-term maintenance operations to test the operational condition of the lift station).

A3.3.2 LAND USE OVERVIEW

Table 3.4 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions of the drainage area of the inter-jurisdictional EVR discharge to Lakeville via Cobblestone Lake.

Table 3.4 - Land Use Change Summary for Inter-Jurisdictional EVR Discharge to Lakeville via Cobblestone Lake

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	543	43	-500	-92%	0	-543	-100%
Farmstead	67	4	-63	-93%	0	-67	-100%
Pits and Quarries	180	297	117	65%	0	-180	-100%
Low Density Residential	1662	2054	392	24%	2125	463	28%
Medium Density Residential	30	97	68	229%	262	233	784%
High Density Residential	15	38	23	160%	48	33	229%
Neighborhood Services	11	22	11	100%	45	34	304%
Commercial	1	0	-1	-100%	28	27	3438%
Industrial	29	84	54	184%	115	85	289%
Institutional	78	126	48	62%	126	48	62%
Mixed Use	0	0	0	0%	0	0	0%
Park	104	116	12	11%	135	30	29%
Open Space	388	162	-226	-58%	160	-229	-59%
Golf Course	36	36	0	0%	36	0	0%
Right-of-Way	166	187	21	13%	187	21	13%
Minnesota Zoo	7	7	0	0%	7	0	0%
Water	174	218	43	25%	218	44	25%
TOTAL	3491	3491			3491		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, the dominant land use is low density residential (48% of the drainage area) followed by row crop agriculture and open space (16% and 11% of the drainage area, respectively).

2. The biggest land use change between the Baseline and Present conditions is a decrease of 500 acres of row crop agriculture, and an increase of almost 400 acres of low density residential. Pits and quarries also increased by nearly 120 acres and open space decreased by about 225 acres.
3. Pits and quarries land use is expected to decrease by 300 acres between the Present and Ultimate conditions. For the dominant urban land uses, medium density residential is expected to increase by about 170 acres and neighborhood services, commercial, and industrial land uses together will increase by about 80 acres between the Present and Ultimate conditions.
4. About two-thirds of the land use changes that will take place between the Baseline and Ultimate conditions have already occurred.

A3.3.3 Overview of Nondegradation Modeling Results

Table 3.5 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the loads that discharge to Lakeville from the outlet of Cobblestone Lake.

Table 3.5 - Modeled Loadings for EVR Inter-Jurisdictional Discharge to Lakeville via Cobblestone Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	1,100	265,000	1,700
Present Condition	1,100	221,000	1,900 (≤1,700)
Ultimate Condition	1,100	247,000	2,000 (≤1,700)

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of both TP and TSS in the Present and Ultimate conditions are less than or equal to the Baseline condition. This is due to the following factors:
    i. Most of the non-urban land that has been converted to urban land uses since the baseline condition was row crop agriculture, which has a relatively high TP and TSS loading rate.
    ii. Between the Baseline and Present conditions, 9 wet detention basins were added in the Project Area to mitigate the impact of the conversion of non-urban land to urban uses. Cumulatively, the area of these detention basins is about 10 acres and the wet volume storage about 36 acre-feet. Modeling shows that each wet detention BMP generally achieves removal efficiencies of 35-50% for total phosphorus and 55-75% for total suspended solids.
    iii. The Ultimate condition TP and TSS reflect:
        - expected future impact of policies in the 2007 SWMP requiring, at a minimum, no-net-increase in TP and TSS loads for most new and re-development activities,
        - the anticipated impact of the Metro-area phosphorus fertilizer ban

    Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current BMPs sufficiently achieve nondegradation. It should be noted that compliance with nondegradation is achieved even without accounting for the zero-discharge conditions from Cobblestone Lake as described in 3.) below.
2. Modeled runoff volume for the EVR inter-jurisdictional discharge to Lakeville (values shown outside the parentheses) increases moderately between the Baseline and Present conditions and slightly

between the Present and Ultimate conditions. The main reason for the modeled difference between the Baseline and Present condition is that the historical conversion of non-urban to urban land uses has increased impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Further, most developments that have occurred since 1990 have not been required to install infiltration BMPs. Thus, no infiltration BMPs are included in the Present condition model, although some have been installed. The City has a requirement in its 2007 SWMP for most development and redevelopment to achieve no net increase of runoff volume, which has been applied in the Ultimate condition model.

3. The water volume loads in parentheses reflect the benefits of zero-discharge from Cobblestone Lake in the East Vermillion River drainage district to Lakeville based on monitoring data collected since 2001. The 2007 SWMP also calls for monitoring and protection of the infiltration capacity of Cobblestone Lake to help ensure that this zero-discharge condition will be maintained for Ultimate condition. Thus, the values in parentheses assume no change in runoff volume from the Baseline condition for the Present and Ultimate condition for the EVR drainage district. (Note: *The threshold of "no increase from the Baseline condition" is the minimum condition that must be met to achieve compliance with nondegradation. In all likelihood, the discharge from the EVR district is less now than it was under the Baseline condition because of the construction of Cobblestone Lake, but there is no readily available data to credibly document this difference. Therefore, for the purposes of meeting nondegradation, the table merely shows no net increase in water volume from the Baseline condition.*)

Table 3.6 shows a comparison of modeled Baseline and Present conditions with and without the BMPs that mitigate stormwater impacts associated with development activities within the drainage area to Lakeville through Cobblestone Lake. The "Without BMPs" scenario presents the modeled loads for the three parameters that would have resulted if there were no wet detention basins incorporated into the City's storm drainage system between 1990 and 2005. Further, the Water Volume for the Present condition has been adjusted to account for the zero-discharge condition for outflow from Cobblestone Lake in the EVR drainage district, as described above. An assessment of pollutant load reduction under the Ultimate condition is not included, as this analysis is intended to estimate the impact of the City's past management practices.

Table 3.6 - Comparison of Baseline and Present Conditions Loads With and Without BMPs for EVR Inter-Jurisdictional Discharge to Lakeville via Cobblestone Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition[1]	1,100	265,000	1,700
Present Condition Without BMPs	1,300	289,000	1,900
Present Condition With BMPs	1,100	221,000	≤1,700
Loads Removed Under Present Condition[2]	200	68,000	≥200

[1] *Where BMPs existed prior to 1990, the Baseline load accounts for that treatment.*

[2] *Loads Removed = Present Loading without BMPs – Present Loading with BMPs*

Key findings are as follows:

1. The loading numbers for "Present Condition Without BMPs" show how pollutant loads would have increased without treatment.
2. Without the BMPs described above, Present condition TP and TSS loadings associated with development within the Project Area would have exceeded Baseline loadings by about 200 pounds/year (18%) and 24,000 pounds/year (9%), respectively. With the BMPs, loadings for these parameters for the Present condition are instead 200 pounds/year (18%) and 44,000 pounds/year (16%) below the Baseline condition, respectively.
3. The modeled runoff volume for both "Present Condition With BMPs" and "Present Condition Without BMPs" is about 200 acre-feet/year (12%) more than for the Baseline condition. These figures do no account for any volume losses, either in Cobblestone Lake or its watershed. As stated previously, the water volume loads in parentheses include the benefits of zero-discharge from the East Vermillion River drainage district to Lakeville based on monitoring data collected since 2001. Thus, the values in parentheses assume no change in runoff volume from the Baseline condition for the Present and more closely reflect what is occurring in this drainage than the modeling numbers.

A3.4 INTER-JURISDICTIONAL WVR DISCHARGE TO LAKEVILLE VIA WVR-P443

A3.4.1 INTRODUCTION

The drainage area of the West Vermillion River (WVR) drainage district inter-jurisdictional discharge to Lakeville via Pond WVR-P443 comprises about 5,400 acres (48%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). This figure includes the 460 acres draining to Alimagnet Lake. The entire WVR drainage district discharges to Lakeville through a 60" storm sewer line from Pond WVR-P443.

A3.4.2 LAND USE OVERVIEW

Table 3.7 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions of the drainage area of the inter-jurisdictional discharge to Lakeville via WVR-P443.

Table 3.7 - Land Use Change Summary for WVR Inter-Jurisdictional Discharge to Lakeville via Pond WVR-P443

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	988	222	-767	-78%	0	-988	-100%
Farmstead	77	8	-69	-89%	0	-77	-100%
Pits and Quarries	538	332	-206	-38%	0	-538	-100%
Low Density Residential	1846	2263	418	23%	2385	539	29%
Medium Density Residential	167	336	169	101%	413	246	147%
High Density Residential	55	191	136	247%	191	136	247%
Neighborhood Services	2	6	5	272%	17	15	871%
Commercial	317	608	291	92%	640	323	102%
Industrial	108	115	7	6%	198	90	83%
Institutional	212	279	67	32%	278	66	31%
Mixed Use	0	0	0	0%	249	249	N/A
Park	137	222	86	63%	293	156	114%
Open Space	414	206	-209	-50%	123	-291	-70%
Golf Course	21	21	0	0%	21	0	0%
Right-of-Way	355	378	23	7%	378	23	7%
Minnesota Zoo	35	34	-1	-3%	34	-1	-3%
Water	103	154	51	50%	155	52	51%
TOTAL	5374	5374			5373[2]		

[1]Change shown is compared to Baseline condition

[2]The Baseline Condition total acreage is more than the other two conditions due to slight differences in the digital land use coverages.

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, the dominant land use is low density residential (34% of the drainage area) followed by row crop agriculture (18% of the drainage area).
2. The biggest land use changes between the Baseline and Present conditions are decreases of almost 800 acres of row crop agriculture and about 200 acres of open space and pits and quarries

land uses each, and increases of over 700 acres of residential and 300 acres of commercial land uses.

3. Row crop agriculture and pits and quarries land uses are expected to decrease by 220 acres and 330 acres, respectively, between the Present and Ultimate conditions. For the dominant urban land uses, low and medium density residential land uses are expected to increase by about 200 acres together and mixed land use (comprised of medium-high density residential, commercial, and industrial) will increase by about 250 acres between the Present and Ultimate conditions.
4. About three-quarters of the land use changes that will take place between the Baseline and Ultimate conditions have already occurred.

A3.4.3 Overview of Nondegradation Modeling Results

Table 3.8 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the loads that discharge to Lakeville from the outlet of stormwater pond WVR-P443.

Table 3.8 - Modeled Loadings for WVR Inter-Jurisdictional Discharge to Lakeville via WVR-P443

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	2,200	600,000	2,900
Present Condition	1,500	224,000	3,600
Ultimate Condition	1,600	246,000	≤2,900

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of both TP and TSS in the Present and Ultimate conditions are less than the Baseline condition. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current BMPs sufficiently achieve nondegradation.
2. The BMP that provides the greatest mitigation of stormwater impacts is a wet detention basin, also known as a stormwater pond. Between the Baseline and Present conditions, 35 wet detention basins were added in this drainage area, and cumulatively, the area of these detention basins is about 51 acres and the wet volume storage about 200 acre-feet. Modeling shows that each wet detention BMP generally achieves removal efficiencies of about 40-50% for total phosphorus and 60-75% for total suspended solids.
3. Modeled runoff volume for the discharge point increases moderately between the Baseline and Present conditions. The reason for this is two-fold. First, the conversion of non-urban to urban land uses increases impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Second, relatively few infiltration BMPs have been constructed in the City to date, and no infiltration BMPs are included in the Present condition model.
4. The water volume loads for the Ultimate condition include the impacts of two additional factors. First, the City has a requirement in its 2007 SWMP for most development and redevelopment to achieve no net increase of runoff volume, which has been applied in the Ultimate condition model. Second, the water volume loads for the Ultimate condition are adjusted to reflect a proposed diversion/infiltration of a portion of the outflow from the West Vermillion River drainage district at Pond WVR-P443. Sizing the diversion to meet the nondegradation Baseline condition for runoff

volume from this drainage will be a consideration in the design of the project and would require the diversion of about 2.25 cfs as a daily average over a 6-month runoff season. Thus, the outflow volumes from the WVR District have been reduced to the Baseline condition to account for this planned project.

5. Loads calculated for the Ultimate condition are based on the assumptions that:
   - The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.
   - The City will apply the water quality treatment requirements of the SWMP (2007) to new developments and redevelopment.
   - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Table 3.9 shows a comparison of modeled Baseline and Present conditions with and without the BMPs that mitigate stormwater impacts associated with development activities within the drainage area to Lakeville through WVR-P443. The "Without BMPs" scenario presents the modeled loads for the three parameters that would have resulted if there were no wet detention basins constructed between 1990 and 2005. An assessment of pollutant load reduction under the Ultimate condition (including the effect of the proposed diversion of outflow from Pond WVR-P443) is not included, as this analysis is intended to estimate the impact of the City's past management practices.

Table 3.9 - Comparison of Baseline and Present Conditions Loads With and Without BMPs Inter-Jurisdictional Discharge to Lakeville via WVR-P443

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition[1]	2,200	600,000	2,900
Present Condition Without BMPs	2,800	803,000	3,600
Present Condition With BMPs	1,500	224,000	3,600
Loads Removed Under Present Condition[2]	1,300	579,000	0

[1] *Where BMPs existed prior to 1990, the Baseline load accounts for that treatment.*

[2] *Loads Removed = Present Loading without BMPs – Present Loading with BMPs*

Key findings are as follows:

1. The loading numbers for "Present Condition Without BMPs" show how pollutant loads would have increased without treatment.
2. Without the BMPs described above, Present TP and TSS loadings associated with development within the Project Area would have exceeded Baseline loadings by about 600 pounds/year (27%) and 203,000 pounds/year (34%), respectively. With the BMPs, loadings for these parameters for the Present condition are instead 700 pounds/year (32%) and 376,000 pounds/year (63%) below the Baseline condition, respectively.
3. None of the BMPs are intended for volume control, and therefore, estimated runoff volume for both "Present Condition With BMPs" and "Present Condition Without BMPs" is about 700 acre-feet/year (24%) more than for the Baseline condition.

A3.5 INTER-JURISDICTIONAL DISCHARGE TO BURNSVILLE VIA LAC LAVON

A3.5.1 INTRODUCTION

The drainage area of the inter-jurisdictional discharge to Burnsville via Lac Lavon comprises only 156 acres (1.4%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). Lac Lavon is essentially a landlocked lake for average annual precipitation conditions, but any overflow would be to Keller Lake and into the City of Burnsville. In fact, the Lake has not discharged to Keller Lake since Lac Lavon's creation in the late 1970's. Never-the-less, a loading assessment is presented for the area of the City draining to Lac Lavon.

A3.5.2 LAND USE OVERVIEW

Table 3.10 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions of the drainage area of the inter-jurisdictional discharge to Burnsville through Lac Lavon.

Table 3.10 - Land Use Change Summary for the Inter-Jurisdictional Discharge to Burnsville via Lac Lavon

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	0	0	0	0%	0	0	0%
Farmstead	0	0	0	0%	0	0	0%
Pits and Quarries	0	0	0	0%	0	0	0%
Low Density Residential	84	84	0	0%	84	0	0%
Medium Density Residential	0	0	0	0%	0	0	0%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	0	0	0	0%	0	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	1	1	0	0%	1	0	0%
Mixed Use	0	0	0	0%	0	0	0%
Park	6	7	1	17%	6	1	14%
Open Space	5	4	-1	-18%	4	-1	-18%
Golf Course	0	0	0	0%	0	0	0%
Right-of-Way	1	1	0	0%	1	0	0%
Minnesota Zoo	0	0	0	0%	0	0	0%
Water	60	60	0	0%	60	0	0%
TOTAL	156	156			156		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, this drainage area is essentially fully developed and the dominant land use is low density residential (54% of the drainage area). Lac Lavon itself comprises 38% of the drainage area.
2. There is only a slight land use change from open space to park (< 1 ac) between the Baseline and Present conditions.
3. Between the Present and Ultimate conditions, land use does not change.

A3.5.3 Overview of Nondegradation Modeling Results

Table 3.11 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the loads at the outlet of Lac Lavon.

Table 3.11 - Modeled Loadings for the Inter-Jurisdictional Discharge to Burnsville via Lac Lavon

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	67	21,700	56
Present Condition	67	21,800	56
Ultimate Condition	59	21,800	56

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of TP in the Present and Ultimate conditions are less than or equal to the Baseline condition. TSS loads in the Present and Ultimate condition are only slightly greater than the Baseline condition (100 lbs), which is a negligible increase.
2. Modeled runoff volume remains constant between the Baseline and Present conditions and again between the Present and Ultimate conditions. This is due to the drainage area being fully-developed in the Baseline condition and having insignificant land use changes over the nondegradation time frame.
3. Loads calculated for the Ultimate condition are based on the assumptions that:
    - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

This drainage area is fully-developed in the Baseline condition. In addition, there were no additional stormwater BMPs constructed between the Baseline and Present conditions. Thus, there is no quantifiable difference between the Present condition with BMPs and Present condition without BMPs scenarios.

A3.6 INTER-JURISDICTIONAL DISCHARGE TO BURNSVILLE VIA KELLER LAKE

A3.6.1 INTRODUCTION

The drainage area of the inter-jurisdictional discharge to Burnsville via Keller Lake comprises about 730 acres (6.5%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). Keller Lake outlets to Crystal Lake. Both lakes are impaired for excess nutrients, and both are located outside of the Project Area in Burnsville. Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS, and runoff volume) are presented for the inter-jurisdictional discharge to Burnsville entering Keller Lake.

A3.6.2 LAND USE OVERVIEW

Table 3.12 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions of the drainage area of the inter-jurisdictional discharge to Burnsville via Keller Lake.

Table 3.12 - Land Use Change Summary for the Inter-Jurisdictional Discharge to Burnsville via Keller Lake

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	0	0	0	0%	0	0	0%
Farmstead	0	0	0	0%	0	0	0%
Pits and Quarries	0	0	0	0%	0	0	0%
Low Density Residential	570	570	0	0%	570	0	0%
Medium Density Residential	17	17	0	0%	17	0	0%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	4	4	0	0%	4	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	70	70	0	0%	70	0	0%
Mixed Use	0	0	0	0%	0	0	0%
Park	38	41	3	7%	40	2	6%
Open Space	16	13	-3	-18%	13	-3	-18%
Golf Course	0	0	0	0%	0	0	0%
Right-of-Way	9	9	0	0%	9	0	0%
Minnesota Zoo	0	0	0	0%	0	0	0%
Water	4	4	0	0%	6	2	49%
TOTAL	729	729			730		

[1]Change shown is compared to Baseline condition

[2]The Baseline condition total acreage is less than the other two conditions due to slight differences in the digital land use coverages.

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, this drainage area is fully developed and the dominant land use is low density residential (78% of the drainage area) followed by institutional (10% of the drainage area).
2. There is only a slight land use change from open space to park (less than 3 acres) between the Baseline and Present conditions.

3. Between the Present and Ultimate conditions, there is only a slight land use change from park to right-of-way (less than 2 acres).

A3.6.3 Overview of Nondegradation Modeling Results

Table 3.13 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the loads entering Keller Lake from the inter-jurisdictional discharge to Burnsville.

Table 3.13 - Modeled Loadings for the Inter-Jurisdictional Discharge to Burnsville via Keller Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	410	108,000	460
Present Condition	410	108,000	460
Ultimate Condition	250	53,400	460

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of both TP and TSS remain constant between the Baseline and Present conditions, signifying the insignificant changes in land use during that period. The TP and TSS loads in the Present condition are somewhat lower than the Baseline condition due to the retrofit of Pond KL-P1 (Redwood Pond). The project was completed in 2005 and expanded the wet volume of the pond from 5.59 acre-feet to 7.52 acre-feet. The TP and TSS loads in the Ultimate condition are much less than the Baseline and Present conditions due to planned construction of a wet detention basin (Whitney Pond) designed to treat stormwater prior to entering Keller Lake, as outlined in the Crystal and Keller Lakes Use Attainability Analysis (Barr, 2003). This drainage area would achieve nondegradation without the construction of this pond, but it is considered necessary to improve the water quality of Keller and Crystal Lakes.
2. Modeled runoff volume remains constant between the Baseline and Present conditions and again between the Present and Ultimate conditions. This is due to the drainage area being fully-developed in the Baseline condition and having insignificant land use changes over the nondegradation time frame.
3. Loads calculated for the Ultimate condition are based on the assumptions that:
   - The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.
   - The City will construct a wet detention basin upstream of Keller Lake as called for in the Crystal and Keller Lakes Use Attainability Analysis (Barr, 2003) and the City's 2007 SWMP.
   - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Due to the drainage area being fully-developed in the Baseline condition, and therefore, not having additional stormwater BMPs constructed between the Baseline and Present conditions, there is no quantifiable difference between the Present condition with BMPs and Present condition without BMPs scenarios.

A3.7 INTER-JURISDICTIONAL DISCHARGE TO BURNSVILLE VIA BLACK DOG WATERSHED

A3.7.1 INTRODUCTION

The drainage area of the inter-jurisdictional discharge to Burnsville into the Black Dog Watershed comprises about 450 acres (4%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). There are two piped discharges from subdistricts BD-11 and BD-14 that cross Interstate 35E from the Project Area to Burnsville and into the Black Dog Watershed. Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS, and runoff volume) are presented for the sum of the two piped discharges into the Black Dog Watershed in Burnsville.

A3.7.2 LAND USE OVERVIEW

Table 3.14 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions of the drainage area of the inter-jurisdictional discharge to Burnsville into the Black Dog Watershed.

Table 3.14 - Land Use Change Summary for the Inter-Jurisdictional Discharge to Burnsville via Black Dog Watershed

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	0	0	0	0%	0	0	0%
Farmstead	0	0	0	0%	0	0	0%
Pits and Quarries	0	0	0	0%	0	0	0%
Low Density Residential	380	380	0	0%	380	0	0%
Medium Density Residential	3	7	5	176%	7	5	176%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	0	0	0	0%	0	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	1	1	0	0%	1	0	0%
Mixed Use	0	0	0	0%	0	0	0%
Park	16	16	0	0%	16	0	0%
Open Space	9	3	-6	-71%	3	-6	-71%
Golf Course	0	0	0	0%	0	0	0%
Right-of-Way	33	34	1	5%	34	1	5%
Minnesota Zoo	0	0	0	0%	0	0	0%
Water	11	11	0	0%	11	0	0%
TOTAL	451	451			451		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, this drainage area is almost entirely developed and the dominant land use is low density residential (84% of the drainage area) followed by right-of-way (7% of the drainage area).

2. There is only a slight land use change from open space (6 acres) to medium density residential (5 acres) and right-of-way (1 acre) between the Baseline and Present conditions.
3. Between the Present and Ultimate conditions, land use does not change.

A3.7.3 Overview of Nondegradation Modeling Results

Table 3.15 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the summation of the loads exiting the Project Area and entering the Black Dog Watershed in Burnsville.

Table 3.15 - Modeled Loadings for the Inter-Jurisdictional Discharge to Burnsville via Black Dog Watershed

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	150	22,700	270
Present Condition	150	22,700	270
Ultimate Condition	140	22,700	270

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of both TP and TSS in the Present and Ultimate condition are less than or equal to the Baseline condition. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current BMPs sufficiently achieve nondegradation.
2. Modeled runoff volume remains constant between the Baseline and Present conditions and again between the Present and Ultimate conditions. This is due to the drainage area being fully-developed in the Baseline condition and having insignificant land use changes over the nondegradation time frame.
3. Loads calculated for the Ultimate condition are based on the assumptions that:
   - The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.
   - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Due to the drainage area being nearly entirely-developed in the Baseline condition, and therefore, not having additional stormwater BMPs constructed between the Baseline and Present conditions, there is no quantifiable difference between the Present condition with BMPs and Present condition without BMPs scenarios.

A3.8 INTER-JURISDICTIONAL DISCHARGE TO EAGAN

A3.8.1 INTRODUCTION

The drainage area of the inter-jurisdictional discharge to Eagan comprises more than 900 acres (8%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). This drainage area is predominantly made up the Minnesota Zoological Gardens, Lebanon Hills Regional Park, and Valleywood Golf Course, and does not have any SWMP Districts assigned to it. This drainage area is also highly depressional, and may not generate a significant amount of runoff volume. However, for the nondegradation loading assessment is it assumed that all land area is connected and capable of discharging overland to Eagan. Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS, and runoff volume) are presented for the sum of loads from the total land area that discharges into Eagan from the Project Area.

A3.8.2 LAND USE OVERVIEW

Table 3.16 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions for the drainage area of the inter-jurisdictional discharge to Eagan.

Table 3.16 - Land Use Change Summary for the Inter-Jurisdictional Discharge to Eagan

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	0	0	0	0%	0	0	0%
Farmstead	0	0	0	0%	0	0	0%
Pits and Quarries	0	0	0	0%	0	0	0%
Low Density Residential	65	67	2	3%	67	2	3%
Medium Density Residential	0	0	0	0%	0	0	0%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	0	0	0	0%	0	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	5	18	12	235%	18	12	235%
Mixed Use	0	0	0	0%	0	0	0%
Park	0	0	0	0%	0	0	0%
Open Space	250	235	-15	-6%	235	-15	-6%
Golf Course	159	159	0	0%	159	0	0%
Right-of-Way	28	28	0	0%	28	0	0%
Minnesota Zoo	411	411	0	0%	411	0	0%
Water	0	0	0	0%	0	0	0%
TOTAL	918	918			918		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, the land use is mainly comprised of the Minnesota Zoological Gardens (45% of the drainage area), Lebanon Hills Regional Park (27% of the drainage area), and the Valleywood Golf Course (17% of the drainage area).

2. The only land use change between the Baseline and Present conditions is a decrease of less than 15 acres of open space, and an increase of about 2 acres of low density residential and 12 acres of institutional land use associated with a school on the Minnesota Zoo campus.
3. About 98% of the land use changes that will take place between the Baseline and Ultimate conditions have already occurred.
4. Between the Present and Ultimate conditions, no land use change occurs.

A3.8.3 Overview of Nondegradation Modeling Results

Table 3.17 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the summation of the loads from the portions of the Project Area that drain toward the City of Eagan (see Figure A3.1).

Table 3.17 - Modeled Loadings for the Inter-Jurisdictional Discharge to Eagan

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	260	158,000	290
Present Condition	270	162,000	310
Ultimate Condition	270	162,000	310

The key findings reflected in the above modeling results are as follows:

1. Despite only slight land use changes during the nondegradation time frame, no stormwater treatment was provided along with the development that occurred in this drainage area. Therefore, calculated loads of TP, TSS, and runoff volume are higher than Baseline condition for both the Present and Ultimate conditions.
2. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that this area does not sufficiently achieve nondegradation for TP and TSS. However, the estimated increases are slight (only 10 lbs TP and 4,000 lbs TSS).
3. The BMP that provides the greatest mitigation of stormwater impacts is wet detention basin, also known as a stormwater pond. There are no wet detention basins in this drainage area, which is why any change in land use results in a change in pollutant loads and runoff volume.
4. Modeled runoff volume for the inter-jurisdictional discharge is higher in the Present and Ultimate conditions than in the Baseline condition. The reason for this is two-fold. First, the conversion of open space to low density residential and institutional increases impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Second, no infiltration BMPs are included in the Present or Ultimate conditions model. The development that occurred in this drainage area was not held to the City's "no net increase of runoff volume" requirement in the SWMP (2007), because the development occurred before the standard was in place.
5. Loads calculated for the Ultimate condition are based on the assumption that:
    - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Due to the absence of modeled stormwater quality BMPs in this drainage area, there is no quantifiable difference between the Present condition with BMPs and Present condition without BMPs scenarios.

A3.9 INTER-JURISDICTIONAL DISCHARGE TO ROSEMOUNT

A3.9.1 INTRODUCTION

The drainage area of the inter-jurisdictional discharge to Rosemount comprises only 69 acres (0.6%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). This drainage area is made up of only three subdistricts from SWMP District EVR that discharge into Rosemount (EVR-45, EVR-46, and EVR-47) Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS, and runoff volume) are presented for the loads from these three subdistricts that discharge into Rosemount from Apple Valley.

A3.9.2 LAND USE OVERVIEW

Table 3.18 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions for the drainage area of the inter-jurisdictional discharge to Rosemount.

Table 3.18 - Land Use Change Summary for the Inter-Jurisdictional Discharge to Rosemount

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	0	0	0	0%	0	0	0%
Farmstead	0	0	0	-95%	0	0	-95%
Pits and Quarries	0	0	0	0%	0	0	0%
Low Density Residential	42	59	16	39%	59	16	39%
Medium Density Residential	0	0	0	0%	0	0	0%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	0	0	0	0%	0	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	0	0	0	0%	0	0	0%
Mixed Use	0	0	0	0%	0	0	0%
Park	0	0	0	0%	0	0	0%
Open Space	16	0	-16	-100%	0	-16	-100%
Golf Course	0	0	0	0%	0	0	0%
Right-of-Way	6	6	0	0%	6	0	0%
Minnesota Zoo	0	0	0	0%	0	0	0%
Water	5	5	0	0%	5	0	0%
TOTAL	69	69			69		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this drainage area follows:

1. Under the Baseline condition, the land use is mainly comprised of low density residential (61% of the drainage area) and open space (23% of the drainage area).
2. The only land use change between the Baseline and Present conditions is a conversion of 16 acres of open space to low density residential.
3. Between the Present and Ultimate conditions, there is no land use change.

A3.9.3 Overview of Nondegradation Modeling Results

Table 3.19 summarizes the modeled differences in loadings for the three parameters for each of the three conditions. These values represent the loads from the portions of the Project Area that drain toward the City of Rosemount (see Figure A3.1).

Table 3.19 - Modeled Loadings for the Inter-Jurisdictional Discharge to Rosemount

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	12	2,890	33
Present Condition	19	4,200	41
Ultimate Condition	17	4,200	41

The key findings reflected in the above modeling results are as follows:

1. During the nondegradation time frame, no additional stormwater treatment was provided along with the development that occurred in this drainage area. Therefore, calculated loads of TP, TSS, and runoff volume are higher than Baseline condition for both the Present and Ultimate conditions.
2. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that this area does not sufficiently achieve nondegradation for TP and TSS. However, the increases are slight (only 5-7 lbs TP and 1,300 lbs TSS).
3. Modeled runoff volume for the inter-jurisdictional discharge is higher in the Present and Ultimate conditions than in the Baseline condition. The reason for this is two-fold. First, the conversion of open space to low density residential increases impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Second, no infiltration BMPs are included in the Present or Ultimate conditions model. The development that occurred in this drainage area was not held to the City's "no net increase of runoff volume" requirement in the SWMP (2007), because the development occurred before the standard was in place.
4. Loads calculated for the Ultimate condition are based on the assumption that:
   - The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.
   - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Due to development occurring without additional stormwater quality BMPs being implemented in this drainage area, there is no quantifiable difference between the Present condition with BMPs and Present condition without BMPs scenarios.

A3.10 LONG LAKE

A3.10.1 INTRODUCTION

Long Lake is one of three lakes within the City of Apple Valley that is impaired for excess nutrients. Long Lake lies within SWMP District EVR and is included in the watershed of Farquar Lake and the drainage area of the inter-jurisdictional discharge to Lakeville via Cobblestone Lake. Long Lake is located in the northeastern corner of Apple Valley and discharges to the east through Farquar Lake, and then into Cobblestone Lake, which then discharges to Lakeville. The drainage area for Long Lake is just under 1,000 acres (about 9%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS and runoff volume) are presented at the inlet to Long Lake.

A3.10.2 LAND USE OVERVIEW

Table 3.20 summarizes the changes in each land use category between the Baseline, Present, and Ultimate conditions for the drainage area to Long Lake, which is contained within the inter-jurisdictional drainage area to Lakeville via Cobblestone Lake (Table 3.4).

Table 3.20 - Land Use Change Summary for the Drainage Area to Long Lake

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	27	0	-27	-100%	0	-27	-100%
Farmstead	8	0	-8	-100%	0	-8	-100%
Pits and Quarries	64	0	-64	-100%	0	-64	-100%
Low Density Residential	634	759	124	20%	759	124	20%
Medium Density Residential	0	0	0	0%	0	0	0%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	0	0	0	0%	0	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	12	39	27	225%	39	27	225%
Mixed Use	0	0	0	0%	0	0	0%
Park	46	46	0	0%	45	0	-1%
Open Space	64	11	-54	-83%	11	-54	-83%
Golf Course	0	0	0	0%	0	0	0%
Right-of-Way	63	63	0	0%	63	0	0%
Minnesota Zoo	7	7	0	0%	7	0	0%
Water	71	72	1	2%	72	2	2%
TOTAL	996	996			996		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this evaluation point are follows:

1. Under the Baseline condition, the dominant land use in the drainage area is low density residential (64% of the drainage area).

2. The biggest land use changes between the Baseline and Present conditions are an increase of 125 acres of low density residential, and a decrease of more than 150 acres of row crop agriculture, farmstead, pits and quarries, and open space land uses together.
3. This drainage area is fully developed in the Present condition, and therefore, there are no notable land use changes between the Baseline and Ultimate conditions.

A3.10.3 Overview of Nondegradation Modeling Results

Table 3.21 summarizes the modeled differences in loads for the three parameters for each of the three conditions. The summary of modeled load estimates is presented at the inlet to Long Lake.

Table 3.21 - Modeled Loadings to Long Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	270	47,800	490
Present Condition	310	56,700	580
Ultimate Condition	280	50,900	580

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of both TP and TSS are higher in the Present and Ultimate conditions than in the Baseline condition. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current BMPs do not sufficiently achieve nondegradation, but the TMDL and execution of the associated implementation plan will successfully meet the intent of nondegradation for TP and TSS loads in 2020.
2. The modeling accounts for the impacts of incorporating new wet detention basins, also known as stormwater ponds, into the City's storm drainage system between the Baseline and Present conditions. During this time period, 3 wet detention basins were added in this drainage area, and cumulatively, the area of these detention basins is about 1.4 acres and the wet volume storage about 1.9 acre-feet.
3. Modeled runoff volume for Long Lake's drainage area increases moderately between the Baseline and Present conditions. The reason for this is two-fold. First, the conversion of non-urban to urban land uses increases impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Second, the development that occurred in this drainage area was not held to the City's "no net increase of runoff volume" requirement in the SWMP (2007), because the development occurred before the standard was in place. Modeled runoff volume for Long Lake's drainage area remains constant between the Present and Ultimate conditions, because no development is anticipated to occur during this time.
4. Loads calculated for the Ultimate condition are based on the assumptions that:
   - The planned retrofit of Pond EVR-P13 will be implemented as part of the Long and Farquar Lakes TMDL/Lake Management Plan. The project is planned for completion during the winter of 2007/2008 and will expand the wet volume of the pond from 0.16 acre-feet to 0.90 acre-feet.
   - The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.

- Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Table 3.22 shows a comparison of modeled Baseline and Present conditions with and without the BMPs that mitigate stormwater impacts associated with development activities within the Long Lake drainage area. The "Without BMPs" scenario presents the modeled loads for the three parameters that would have resulted if there were no additional stormwater basins. An assessment of pollutant load reduction under the Ultimate condition is not presented because that would be a hypothetical, projected scenario with unknown magnitude, types, and performance of future stormwater treatment methods.

Table 3.22 - Comparison of Baseline and Present Conditions Loads With and Without BMPs to Long Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition[1]	270	47,800	490
Present Condition Without BMPs	320	58,700	580
Present Condition With BMPs	310	56,700	580
Loads Removed Under Present Condition[2]	10	2,000	0

[1] Where BMPs existed prior to 1990, the Baseline load accounts for that treatment.

[2] Loads Removed = Present Loading without BMPs – Present Loading with BMPs

Key findings are as follows:

1. The loading numbers for "Present Condition Without BMPs" shows how pollutant loads would have increased without treatment.
2. Without the BMPs described above, Present TP and TSS loadings associated with development within the Long Lake drainage area would have exceeded Baseline loadings by 50 pounds/year (19%) and 10,900 pounds/year (23%), respectively. With the installed BMPs, loadings for these parameters for the Present condition are instead 40 pounds/year (15%) and 8,900 pounds/year (19%) above the Baseline condition, respectively.
3. None of the BMPs are intended for volume control, and therefore, estimated runoff volume for both "Present Condition With BMPs" and "Present Condition Without BMPs" is about 90 acre-feet/year (18%) more than the Baseline condition.

A3.11 FARQUAR LAKE

A3.11.1 INTRODUCTION

Farquar Lake is also impaired for excess nutrients within the City of Apple Valley. Farquar Lake lies within SWMP District EVR and is included in the drainage area of the inter-jurisdictional discharge to Lakeville via Cobblestone Lake. Farquar Lake is located in the northeastern corner of Apple Valley and discharges to Cobblestone Lake, which then discharges to Lakeville. The Long Lake drainage area is contained within the Farquar Lake drainage area, because Long Lake drains directly to Farquar Lake. The drainage area for Farquar Lake is just over 2,000 acres (about 19%) of the 11,200-acre nondegradation Project Area (see Figure A3.1). Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS and runoff volume) are presented at the inlet to Farquar Lake.

A3.11.2 LAND USE OVERVIEW

Table 3.23 summarizes the changes in each land use category between the Baseline, Present, and the Ultimate conditions for the drainage area to Farquar Lake, which is contained within the drainage area to the Lakeville via Cobblestone Lake.

Table 3.23 - Land Use Change Summary for the Drainage Area to Farquar Lake

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	41	0	-41	-100%	0	-41	-100%
Farmstead	32	0	-32	-100%	0	-32	-100%
Pits and Quarries	64	0	-64	-100%	0	-64	-100%
Low Density Residential	1,196	1,423	227	19%	1,423	227	19%
Medium Density Residential	0	12	12	N/A	12	12	N/A
High Density Residential	15	15	0	0%	15	0	0%
Neighborhood Services	0	0	0	0%	0	0	0%
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	52	92	40	76%	92	40	76%
Mixed Use	0	0	0	0%	0	0	0%
Park	68	76	8	12%	76	8	12%
Open Space	297	128	-169	-57%	128	-169	-57%
Golf Course	36	36	0	0%	36	0	0%
Right-of-Way	106	123	16	15%	123	16	15%
Minnesota Zoo	7	7	0	0%	7	0	0%
Water	160	163	3	2%	163	3	2%
TOTAL	2,074	2,074			2,074		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this evaluation point follows:

1. Under the Baseline condition, the dominant land use in the drainage is low density residential (58% of the drainage area) followed by open space (14% of the drainage area).

2. The biggest land use changes between the Baseline and Present conditions are an increase of nearly 230 acres of low density residential, and a decrease of more than 300 acres of row crop agriculture, farmstead, pits and quarries, and open space land uses together.
3. This drainage area is fully developed in the Present condition, and therefore, there are no notable land use changes between the Present and Ultimate conditions.

A3.11.3 Overview of Nondegradation Modeling Results

Table 3.24 summarizes the modeled differences in loads for the three parameters for each of the three conditions. The summary of modeled load estimates is presented at the inlet to Farquar Lake.

Table 3.24 - Modeled Loadings to Farquar Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	570	113,000	990
Present Condition	620	108,000	1,100
Ultimate Condition	560	102,000	1,100

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of TP are higher in the Present condition than in the Baseline condition, but TSS in the Present condition and both TP and TSS for the Ultimate condition are less than the Baseline condition. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current BMPs sufficiently achieve nondegradation. Successful implementation of the completed TMDL for Long and Farquar Lake will further reduce relative TP and TSS loads from the modeled condition shown above.
2. The modeling accounts for the impacts of incorporating new wet detention basins, also known as stormwater ponds, into the City's storm drainage system between the Baseline and Present conditions. During this time period, 6 wet detention basins were added in this drainage area, and cumulatively, the area of these detention basins is about 3 acres and the wet volume storage about 5.7 acre-feet.
3. Modeled runoff volume for Farquar Lake's drainage area increases moderately between the Baseline and Present conditions. The reason for this is two-fold. First, the conversion of non-urban to urban land uses increases impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Second, the development that occurred in this drainage area was not held to the City's "no net increase of runoff volume" requirement in the SWMP (2007), because the development occurred before the standard was in place. Modeled runoff volume for Farquar Lake's drainage area remains constant between the Present and Ultimate conditions, because no development is anticipated to occur during this time.
4. Loads calculated for the Ultimate condition are based on the assumptions that:
   - The planned retrofit of Pond EVR-P13 will be implemented as part of the Long and Farquar Lakes TMDL/Lake Management Plan. The project is planned for completion during the winter of 2007/2008 and will expand the wet volume of the pond from 0.16 acre-feet to 0.90 acre-feet.

- The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.
- Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Table 3.25 shows a comparison of modeled Baseline and Present conditions with and without the BMPs that mitigate stormwater impacts associated with development activities within the Farquar Lake drainage area. The "Without BMPs" scenario presents the modeled loads for the three parameters that would have resulted if there were no additional stormwater basins. An assessment of pollutant load reduction under the Ultimate condition is not presented because that would be a hypothetical, projected scenario with unknown magnitude, types, and performance of future stormwater treatment methods.

Table 3.25 - Comparison of Baseline and Present Conditions Loads With and Without BMPs to Farquar Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition[1]	570	113,000	990
Present Condition Without BMPs	680	132,000	1,100
Present Condition With BMPs	620	108,000	1,100
Loads Removed Under Present Condition[2]	60	24,000	0

[1] *Where BMPs existed prior to 1990, the Baseline load accounts for that treatment.*

[2] *Loads Removed = Present Loading without BMPs – Present Loading with BMPs*

Key findings are as follows:

1. The loading numbers for "Present Condition Without BMPs" show how pollutant loads would have increased without treatment.
2. Without the BMPs described above, Present TP and TSS loadings associated with development within the Farquar Lake drainage area would have exceeded Baseline loadings by 110 pounds/year (19%) and 19,000 pounds/year (17%), respectively. With the installed BMPs, loadings for these parameters for the Present condition are instead 50 pounds/year (9%) above and 5,000 pounds/year (4%) below the Baseline condition, respectively.
3. None of the BMPs are intended for volume control, and therefore, estimated runoff volume for both "Present Condition With BMPs" and "Present Condition Without BMPs" scenarios is about 110 acre-feet/year (11%) more than the Baseline condition.

A3.12 ALIMAGNET LAKE

A3.12.1 INTRODUCTION

Alimagnet Lake is another lake within the City of Apple Valley that is impaired for nutrients. Alimagnet Lake lies within SWMP District AL, and is included in the drainage area of the inter-jurisdictional discharge to Lakeville via WVR-P443. The drainage area for Alimagnet Lake is 461 acres (4%) of the 11,900-acre nondegradation Project Area (see Figure A3.1). Alimagnet Lake lies on the western border of Apple Valley and Burnsville. Alimagnet Lake's drainage area is comprised of land in both Burnsville and Apple Valley, but this loading assessment only evaluates the stormwater drainage resulting from the City of Apple Valley. Alimagnet Lake discharges through a series of ponds into WVR-P443, which then discharges into Lakeville. Load estimates for the three conditions (Baseline, Present, and Ultimate) for the three parameters (TP, TSS and runoff volume) are presented at the inlet to Alimagnet Lake.

A3.12.2 LAND USE OVERVIEW

Table 3.26 summarizes the changes in each land use category between the Baseline, Present, and the Ultimate conditions for the drainage area to Alimagnet Lake, which is contained within the drainage area to Lakeville via WVR-P443.

Table 3.26 - Land Use Change Summary for the Drainage Area to Alimagnet Lake

Land Use	Baseline (ac)	Present[1]			Ultimate[1]		
		Acres	Change (ac)	Change (%)	Acres	Change (ac)	Change (%)
Row Crop Agriculture	0	0	0	0%	0	0	0%
Farmstead	0	0	0	0%	0	0	0%
Pits and Quarries	0	0	0	0%	0	0	0%
Low Density Residential	185	192	7	4%	192	7	4%
Medium Density Residential	50	83	33	67%	83	33	67%
High Density Residential	0	0	0	0%	0	0	0%
Neighborhood Services	0	5	5	N/A	5	5	N/A
Commercial	0	0	0	0%	0	0	0%
Industrial	0	0	0	0%	0	0	0%
Institutional	0	0	0	0%	0	0	0%
Mixed Use	0	0	0	0%	0	0	0%
Park	7	7	0	1%	7	0	1%
Open Space	131	75	-56	-43%	75	-56	-43%
Golf Course	21	21	0	0%	21	0	0%
Right-of-Way	18	27	9	50%	27	9	50%
Minnesota Zoo	0	0	0	0%	0	0	0%
Water	49	52	3	5%	52	3	5%
TOTAL	461	461			461		

[1]*Change shown is compared to Baseline condition*

A narrative summary of the most significant land use factors affecting this evaluation point follows:

1. Under the Baseline condition, the dominant land use in the drainage is low density residential (40% of the drainage area) followed by open space (28% of the drainage area).

2. The biggest land use changes between the Baseline and Present conditions are a decrease of more than 50 acres of open space, and an increase of more than 30 acres of medium density residential.
3. This drainage area is fully developed in the Present condition, and therefore, there are no notable land use changes between the Baseline and Ultimate conditions.

A3.12.3 Overview of Nondegradation Modeling Results

Table 3.27 summarizes the modeled differences in loads for the three parameters for each of the three conditions. The summary of modeled load estimates is presented at the inlet to Alimagnet Lake.

Table 3.27 - Modeled Loadings to Alimagnet Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition	150	42,000	200
Present Condition	160	39,300	240
Ultimate Condition	140	36,700	240

The key findings reflected in the above modeling results are as follows:

1. Calculated loads of TP are higher in the Present condition than in the Baseline condition, but TSS in the Present condition and both TP and TSS for the Ultimate condition are less than the Baseline condition. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current BMPs sufficiently achieve nondegradation.
2. The modeling accounts for the impacts of incorporation of new wet detention basins, also known as a stormwater pond into the City's storm drainage system between the Baseline and Present conditions. During this time period, 6 wet detention basins were added in this drainage area, and cumulatively, the area of these detention basins is about 2.6 acres and the wet volume storage about 3.5 acre-feet.
3. Modeled runoff volume for this drainage area increases slightly between the Baseline and Present conditions. The reason for this is two-fold. First, the conversion of non-urban to urban land uses increases impervious coverage, which is reflected in a higher runoff coefficient for the urban land uses. Second, the development that occurred in this drainage area was not held to the City's "no net increase of runoff volume" requirement in the SWMP (2007), because the development occurred before the standard was in place. Modeled runoff volume for this drainage area remains constant between the Present and Ultimate conditions, because no development is anticipated to occur during this time.
4. Loads calculated for the Ultimate condition are based on the assumptions that:
   - The planned retrofit of Pond AL-P8 will be implemented as part of the Alimagnet Lake Management Plan. The project is planned for completion during the winter of 2007/2008 and will expand the wet volume of the pond from 0.16 acre-feet to 0.90 acre-feet.
   - The City will sufficiently maintain water quality basins to sustain their intended functions and capacities.
   - Public information and education efforts supporting the phosphorus fertilizer application restrictions will result in a 13% reduction in phosphorus loading from all residential property.

Table 3.28 shows a comparison of modeled Baseline and Present conditions with and without the BMPs that mitigate stormwater impacts associated with development activities within the Alimagnet Lake drainage area. The "Without BMPs" scenario presents the modeled loads for the three parameters that would have resulted if there were no additional stormwater basins. An assessment of pollutant load reduction under the Ultimate condition is not presented because that would be a hypothetical, projected scenario with unknown magnitude, types, and performance of future stormwater treatment methods.

Table 3.28 - Comparison of Baseline and Present Conditions Loads With and Without BMPs to Alimagnet Lake

	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)
Baseline Condition[1]	150	42,000	200
Present Condition Without BMPs	190	49,100	240
Present Condition With BMPs	160	39,300	240
Loads Removed Under Present Condition[2]	30	9,800	0

[1] *Where BMPs existed prior to 1990, the Baseline load accounts for that treatment.*

[2] *Loads Removed = Present Loading without BMPs – Present Loading with BMPs*

Key findings are as follows:

1. The loading numbers for "Present Condition Without BMPs" show how pollutant loads would have increased without treatment.
2. Without the BMPs described above, Present TP and TSS loadings associated with development within the Alimagnet Lake drainage area would have exceeded Baseline loadings by 40 pounds/year (27%) and 7,100 pounds/year (17%), respectively. With the BMPs, loadings for these parameters for the Present condition are instead about 10 pounds/year (7%) above and 2,700 pounds/year (7%) below the Baseline loading condition, respectively.
3. None of the BMPs are intended for volume control, and therefore, estimated runoff volume for both "Present Condition With BMPs" and "Present Condition Without BMPs" scenarios is about 40 acre-feet/year (20%) more than the Baseline condition.

Part B – Nondegradation Report

B1. Background

This Nondegradation Report (Part B) summarizes the findings of the Loading Assessment, discusses those findings in the context of the City's current stormwater management program, and identifies how the City's Storm Water Pollution Prevention Program (SWPPP) will be modified to address Nondegradation of all waters.

B2. Overview of Key Findings from the Loading Assessment

The key findings of the Loading Assessment for all waters within the Project Area are as follows:

1. For the Project Area, calculated loads of both TP and TSS in the Present and Ultimate conditions are less than the Baseline condition. Since the objective of the nondegradation rule is to prevent pollutant load increases above 1990 levels, these data indicate that the City's current stormwater management program as reflected in the 2007 SWMP is sufficient to achieve nondegradation for these parameters.

2. Water volume loads for the City as a whole are also projected to be at or below the Baseline condition for the Ultimate development condition. This is a consequence of three important factors, all of which are supported in the 2007 SWMP:
    a. The City has a policy in its 2007 SWMP for most development and redevelopment to achieve no net increase of runoff volume from the pre-development baseline condition, which has been applied in the Ultimate condition model.
    b. There is no discharge of water from the East Vermillion River (EVR) drainage district to Lakeville based on monitoring data collected since 2001. The 2007 SWMP also calls for steps to be taken to monitor and protect the infiltration capacity of Cobblestone Lake to ensure that this zero-discharge condition will be maintained for the Ultimate development condition under average annual precipitation conditions. Thus, the water volume estimates assume no increase in runoff volume from the Baseline condition for the Present and Ultimate condition for the EVR drainage district.
    c. The water volume loads for the Ultimate condition are adjusted to reflect a proposed diversion/infiltration of a portion of the outflow from the West Vermillion River (WVR) drainage district at Pond WVR-P443. This capital improvement is identified as a priority in the City's 2007 SWMP. Sizing the diversion to meet the nondegradation Baseline condition for runoff volume from this drainage will be a consideration in the design of the project.

3. In addition to estimating loads for the entire City as a whole, the loading assessment also looked at TP and TSS loads at jurisdictional boundaries with the adjacent municipalities of Rosemount, Lakeville, Burnsville, and Eagan. Calculated TP and TSS loads as well as water volume are anticipated to be at or below the Baseline condition for discharges to both Lakeville and Burnsville. The drainage areas within Apple Valley that discharge to Eagan and Rosemount are either mostly undeveloped and expected to remain so (as in the case of Eagan) or small (as in the case of Rosemount, which receives runoff from just under 70 acres in Apple Valley). In both cases, loading assessment results indicate slight increases in TP and TSS loads to both communities for the present and 2020 condition compared to the baseline condition. The total estimated annual load increase from the Baseline condition exported to both communities compared to the Ultimate condition is about 15 pounds and 5,300 pounds, respectively, of TP and TSS, and 28 acre-feet of runoff volume. With the consent of these neighboring communities, the City maintains this load increase is insignificant and does not warrant an additional and separate mitigation effort over and above the City-wide measures outlined in the report.

4. Comparative load estimates for the three time periods were also developed for the City's three nutrient-impaired waters, Long Lake, Farquar Lake, and Alimagnet Lake. Through a joint effort with the City of Burnsville, a Lake Management Plan has been completed and is currently being implemented for Alimagnet Lake, as per the City's 2007 SWMP. Through a joint effort with the Vermillion River Watershed Joint Powers Organization, the City has developed and will submit a completed TMDL for both Long and Farquar Lakes to MPCA and USEPA in January 2008 for approval and subsequent implementation. These plans lay out a prudent and feasible, publicly supported strategy for meeting the intent of Minnesota's nondegradation rules for total phosphorus and total suspended solids and will be implemented to achieve the goals within each plan by 2020. Both efforts are called out as high priorities in the City's 2007 Surface Water Management Plan (SWMP). Runoff volume is expected to remain above the Baseline condition for each of the lakes. However, the increased volume is conveyed entirely through the storm sewer system and does not discharge to natural water courses where channel stability could be an issue. Thus, increases in runoff volume alone should not be considered as failing to meet nondegradation.

B3. Historical and Current Context for Apple Valley's Stormwater Management

The City of Apple Valley's first initiatives in stormwater management were initiated in the mid-1980s. While Minnesota's first construction stormwater permit wasn't issued until 1998, the Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination Program System (NPDES) program requirements for stormwater management were first developed in the late 1980's in response to the Federal Clean Water Act Amendment in 1987. During the same time period, the City of Apple Valley was working on developing a municipal surface water management plan. The Plan was completed in 1986, updated in 1997, and has been implemented aggressively since that time. The plans were intended to more effectively address Apple Valley's rapid growth and mitigate the impact of increased stormwater runoff due to urbanization on the community's resources as well as minimize impacts to downstream water resources in other communities. The fundamental approach adopted by the City was the integration of a local and regional stormwater pond network within its stormwater conveyance system to manage stormwater quality in addition to stormwater quantity. As part of this process, the City developed specific criteria upon which wet detention basin designs were based. This initiative is the primary reason why over 40 local and regional detention basins were constructed after the Baseline year (1990). Further, it was recognized that the unique surficial geology in the southern and southeastern portions of the City made possible infiltration of large amounts of runoff to recharge underlying aquifers and minimize surface runoff discharges to downstream communities.

In October 2007, the City will formally adopt an updated and enhanced Surface Water Management Plan (SWMP) for the City. The SWMP meets or exceeds the requirements of all local water management authorities covering the City of Apple Valley (the Black Dog Watershed Management Organization and the Vermillion River Watershed Joint Powers Organization) and will be approved by those organizations prior to the City Council's adoption of it. The SWMP was tailored in part to meet the requirements of nondegradation.

B4. Proposed SWPPP Modifications

The Loading Assessment has shown that the City's surface water management program as presented in its 2007 SWMP is adequate to meet the requirements of nondegradation and that no modifications to its program are necessary. However, the City is proposing a modification of SWPPP BMP-5-6 – Storm Water Management Plan to emphasize those aspects of the SWMP that are important in meeting nondegradation objectives. A revised BMP page for BMP-5-6 can be found in Appendix D.

B5. Summary and Determination

In this Nondegradation Review, the City of Apple Valley has shown that it satisfies the nondegradation rules. Specifically, sufficient treatment has been or will be provided as part of established City policy so that TP and TSS loads for present and likely future development conditions are less than or equal to 1990 levels. In addition, unique sub-soil conditions underlying the south central and southeast portions of the City, policies in the 2007 SWMP that support volume control for both new and re-development activities, and a retrofit project identified as a high priority in the City's SWMP implantation program will help assure that the Ultimate condition runoff volumes will meet the Baseline condition as well. The City has prepared a modification to one of its existing BMPs in its SWPPP that emphasizes those aspects of the 2007 SWMP that address nondegradation. Therefore, the City requests a determination by the MPCA that the City's 2006 – 2011 SWPPP and the proposed SWPPP modification are reasonable control measures and that no other control measures are warranted.

The City of Apple Valley does not discharge to any Outstanding Resource Value Waters (ORVWs), therefore there is no need to prepare a restricted discharge waters analysis as part of this submittal.

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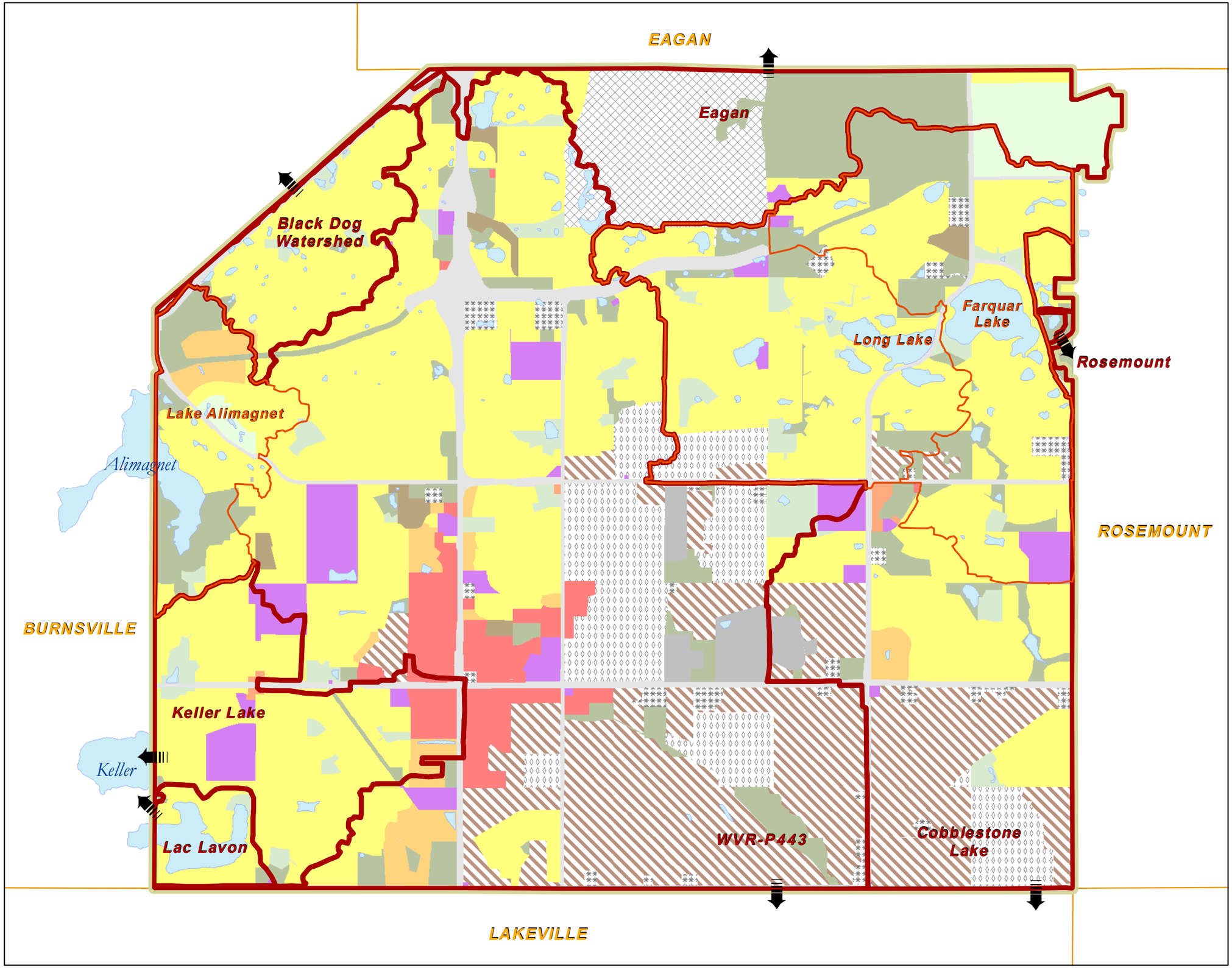
Appendix A – Land Use Maps and Data

City of Apple Valley Nondegradation Review

Figure A-1

Baseline (1990) Condition Land Use



Legend

- Project Area
- Inter-jurisdictional Discharge
- Tributary Drainage to Inter-jurisdictional Discharge
- Tributary Drainage to Nutrient-Impaired Water Bodies
- City Boundaries

Land Use

- Agriculture
- Commercial
- Farmstead
- Golf
- High Density Residential
- Industrial
- Institutional
- Low Density Residential
- Medium Density Residential
- Neighborhood Service
- Open Space
- Park
- Gravel Pits & Quarries
- ROW
- Water
- Zoo

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Apple Valley

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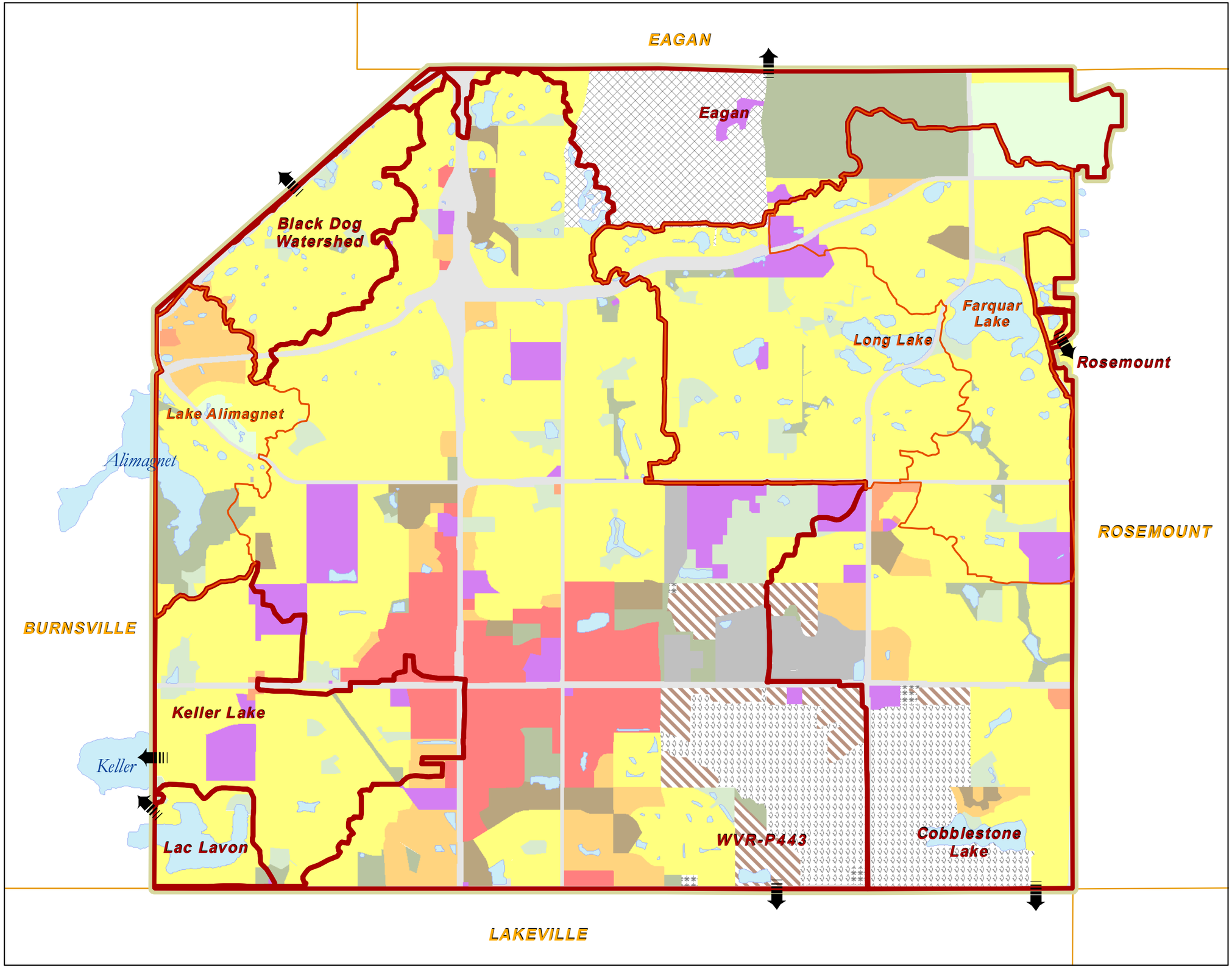
City of Apple Valley Nondegradation Review

Figure A-2

Present (2005) Condition Land Use



Legend

- Project Area
- Inter-jurisdictional Discharge
- Tributary Drainage to Inter-jurisdictional Discharge
- Tributary Drainage to Nutrient-Impaired Water Bodies
- City Boundaries

Land Use

- Agriculture
- Commercial
- Farmstead
- Golf
- High Density Residential
- Industrial
- Institutional
- Low Density Residential
- Medium Density Residential
- Neighborhood Service
- Open Space
- Park
- Gravel Pits & Quarries
- ROW
- Water
- Zoo

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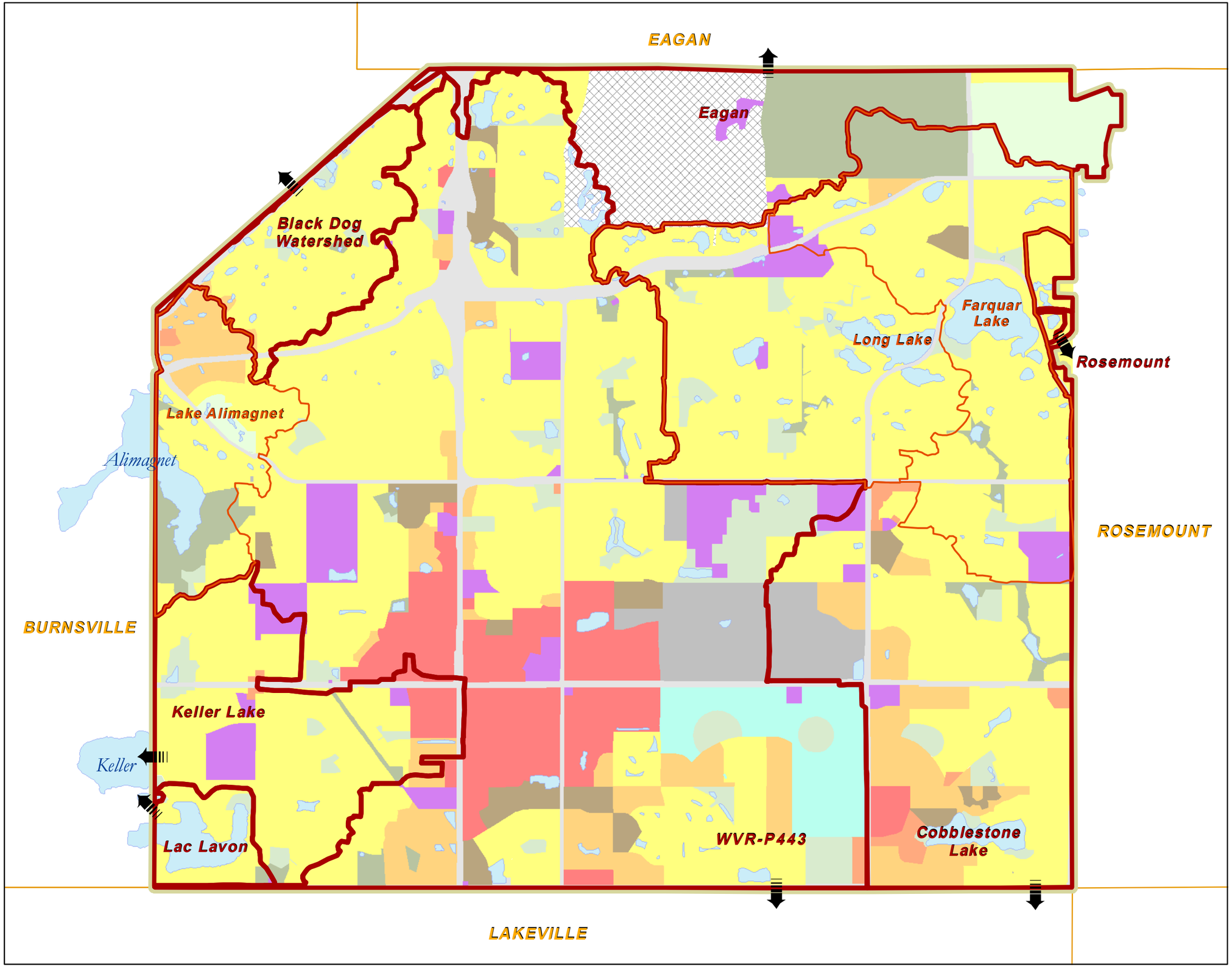
City of Apple Valley Nondegradation Review

Figure A-3

Ultimate (2020) Condition Land Use



Legend

- Project Area
- Inter-jurisdictional Discharge
- Tributary Drainage to Inter-jurisdictional Discharge
- Tributary Drainage to Nutrient-Impaired Water Bodies
- City Boundaries

Land Use

- Commercial
- Golf
- High Density Residential
- Industrial
- Institutional
- Low Density Residential
- Medium Density Residential
- Mixed Use
- Neighborhood Service
- Open Space
- Park
- ROW
- Water
- Zoo

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Apple Valley

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BASELINE CONDITION (1990)

Watershed ID	Land Use Category																TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	PARK	OPEN	GOLF	ROW	WAT	ZOO		
AL-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.0	3.8	3.8
AL-100	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	11.1	11.1
AL-11	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.1	0.5	0.0	21.0	20.5
AL-12	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.4	0.0	9.5	9.0
AL-13	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.1	0.4	0.0	7.9	7.5
AL-14	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	7.4	7.2
AL-2	0.0	0.0	0.0	1.1	28.3	0.0	0.0	0.0	0.0	0.0	0.0	23.2	0.0	4.1	0.0	0.0	56.7	56.7
AL-200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.3	0.0	0.0	1.9	1.9
AL-201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.3	0.0	0.0	4.2	4.2
AL-202	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	2.9	0.0	0.0	10.2	10.2
AL-3	0.0	0.0	0.0	1.3	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.0	11.6	11.3
AL-4	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.3	0.0	13.0	12.7
AL-5	0.0	0.0	0.0	36.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.7	2.2	0.9	0.0	40.9	40.0
AL-6	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.7	0.0	22.4	21.7
AL-7	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	2.6	2.1
AL-8	0.0	0.0	0.0	18.3	12.2	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	4.0	0.9	0.0	42.6	41.7
AL-9	0.0	0.0	0.0	69.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	74.2	0.0	0.5	44.0	0.0	194.3	150.2
BD-1	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	30.6	30.5
BD-10	0.0	0.0	0.0	26.6	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	1.3	0.0	32.1	30.9
BD-100	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.0	2.8
BD-101	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
BD-102	0.0	0.0	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	26.6	26.4
BD-103	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	2.7	2.6
BD-104	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.6	1.6
BD-11	0.0	0.0	0.0	27.1	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.5	0.0	1.9	0.8	0.0	32.1	31.2
BD-110	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.4	0.0	3.7	3.3
BD-12	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	3.1	2.6
BD-120	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	2.0	2.0
BD-13	0.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	9.4	8.4
BD-14	0.0	0.0	0.0	37.1	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	1.7	1.8	0.0	43.8	42.0
BD-140	0.0	0.0	0.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	2.5	0.9	0.0	18.8	17.9
BD-15	0.0	0.0	0.0	45.3	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	1.4	0.1	0.0	47.5	47.3
BD-150	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	6.8	6.8
BD-2	0.0	0.0	0.0	16.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.7	0.0	21.3	20.6
BD-3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6
BD-4	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	6.1	6.0
BD-5	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	25.2	25.0
BD-6	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	4.6	4.5
BD-61	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	12.2	12.0
BD-7	0.0	0.0	0.0	58.9	0.0	0.0	0.0	0.0	0.0	0.5	1.1	2.4	0.0	0.0	0.2	0.0	63.1	62.9
BD-70	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	6.2	6.2
BD-71	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4
BD-8	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.4	0.0	8.5	8.1
BD-9	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	8.1	7.3
BD-90	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	4.6	0.8	0.0	9.0	8.2
EVR-1	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.5	0.0	3.8	0.9	0.0	19.1	18.2
EVR-10	0.0	0.0	0.0	65.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	7.8	0.5	0.0	74.1	73.6
EVR-11	0.0	0.0	0.0	14.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.0	15.8	15.5
EVR-12	0.0	0.0	0.0	49.5	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.4	0.0	0.0	5.6	0.0	61.0	55.4
EVR-13	0.0	6.0	0.0	43.9	0.0	0.0	0.0	0.0	0.0	0.9	10.8	20.9	0.0	0.5	0.3	0.8	84.3	83.9
EVR-14	0.0	0.0	0.0	19.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.0	0.0	0.0	2.7	0.0	25.8	23.0
EVR-15	1.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	12.1	12.1

BASELINE CONDITION (1990)

Watershed ID	Land Use Category																TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	PARK	OPEN	GOLF	ROW	WAT	ZOO		
EVR-150	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	1.0	0.0	7.8	6.8
EVR-151	12.5	0.9	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.3	0.0	0.0	23.5	23.5
EVR-16	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	7.1	6.9
EVR-160	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.2	0.1	0.0	6.8	6.7
EVR-17	0.0	0.3	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.5	34.0	0.0	83.4	49.4
EVR-170	3.7	0.0	0.0	58.9	0.0	0.0	0.1	0.0	0.0	0.0	2.2	5.3	0.0	18.0	7.5	0.0	95.7	88.2
EVR-18	0.0	0.9	0.0	46.3	0.0	0.0	0.0	0.0	0.0	0.8	0.0	16.0	0.0	0.0	2.2	0.0	66.3	64.1
EVR-180	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	3.3	0.0	8.5	0.0	0.0	0.6	0.0	13.1	12.5
EVR-19	0.0	8.8	0.0	43.7	0.0	0.4	0.0	0.0	0.0	0.0	0.0	70.2	29.8	12.0	4.8	0.0	169.6	164.8
EVR-190	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.5	0.0	0.0	0.0	0.0	46.5	46.5
EVR-2	0.0	0.0	0.0	74.0	0.0	0.0	0.0	0.0	0.0	2.0	0.5	0.0	0.0	0.0	7.7	0.0	84.2	76.5
EVR-20	0.0	0.0	0.0	27.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	29.3	27.7
EVR-21	0.0	4.4	0.0	8.6	0.0	10.8	0.0	0.0	0.0	0.0	0.0	33.3	0.0	6.8	0.0	0.0	63.9	63.9
EVR-210	0.0	1.1	0.0	49.1	0.0	3.4	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.8	0.0	57.8	57.1
EVR-211	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0
EVR-22	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.9	0.0	36.4	33.5
EVR-220	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.0	3.6	3.3
EVR-221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	1.1	0.0	0.0	7.0	7.0
EVR-24	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.9	11.8
EVR-25	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	12.1	0.0	1.8	0.0	0.1	0.0	0.0	14.3	14.3
EVR-26	0.0	0.0	0.0	43.2	0.0	0.0	0.0	0.0	0.0	24.1	2.3	4.9	0.0	1.9	2.0	0.0	78.3	76.3
EVR-27	0.0	0.0	0.0	77.9	0.0	0.0	0.0	0.0	0.0	0.0	3.6	7.6	0.0	1.1	0.5	0.0	90.7	90.2
EVR-28	0.0	2.3	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	5.7	5.7
EVR-280	0.0	5.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	6.2	6.2
EVR-29	13.3	1.9	0.0	51.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.3	0.0	11.3	2.2	0.0	113.0	110.8
EVR-290	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	9.5	8.9
EVR-3	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.4	0.0	15.8	15.4
EVR-30	0.0	7.1	0.0	29.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	37.8	36.9
EVR-31	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.0	6.1	6.0
EVR-32	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	2.8	2.5
EVR-33	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	7.1	5.9
EVR-34	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	0.0	14.2	12.3
EVR-35	0.0	0.0	0.0	59.7	0.0	0.0	0.0	0.0	0.0	0.0	7.6	1.7	0.0	6.2	67.0	0.0	142.2	75.2
EVR-350	0.0	0.0	0.0	33.1	0.0	0.0	0.0	0.0	0.0	0.0	8.8	0.0	0.0	0.3	0.2	0.0	42.4	42.2
EVR-351	0.0	0.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	21.5	21.5
EVR-352	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0	0.0	6.8	4.8
EVR-36	0.5	0.0	0.0	52.3	0.0	0.0	0.0	0.0	0.0	18.4	2.7	0.0	0.0	5.3	0.6	0.0	79.8	79.1
EVR-37	0.8	1.9	0.0	13.9	0.0	0.0	0.0	0.0	0.0	2.9	0.0	1.0	0.0	4.9	0.2	0.0	25.4	25.3
EVR-38	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	14.3	13.8
EVR-39	0.0	1.8	0.0	139.6	6.8	0.0	11.1	0.8	0.0	2.1	10.9	44.3	0.0	0.3	3.5	0.0	221.3	217.7
EVR-4	11.2	0.3	63.2	1.8	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	7.2	0.0	0.0	84.2	84.2
EVR-40	0.0	0.0	0.0	99.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	12.2	0.0	1.8	3.5	0.0	116.9	113.4
EVR-400	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	8.9	8.9
EVR-41	57.1	10.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	68.9	68.9
EVR-42	131.8	3.5	0.0	22.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	0.0	0.0	169.3	169.3
EVR-43	2.4	0.0	0.2	75.6	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.5	0.0	89.8	89.3
EVR-430	0.1	0.2	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.0	0.0	13.2	13.2
EVR-44	204.9	3.5	115.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	9.9	0.0	0.0	334.4	334.4
EVR-440	6.2	1.0	0.0	0.2	5.6	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	5.2	0.0	0.0	19.9	19.9
EVR-45	0.0	0.0	0.0	35.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	0.0	37.6	36.1
EVR-46	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.4	1.5	0.0	9.0	7.5
EVR-47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.8	1.9	0.0	8.5	6.6

BASELINE CONDITION (1990)

Watershed ID	Land Use Category																TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	PARK	OPEN	GOLF	ROW	WAT	ZOO		
EVR-48	97.6	6.1	0.0	0.9	3.4	0.0	0.0	0.0	29.1	0.1	0.0	12.0	0.0	10.7	0.0	0.0	160.0	160.0
EVR-49	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
EVR-5	0.0	0.0	0.1	75.2	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.5	0.0	79.3	78.8
EVR-50	0.0	0.0	0.0	35.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.4	0.8	39.9	37.5
EVR-51	0.0	0.0	0.0	19.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	1.7	22.8	22.8
EVR-52	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.8	0.9	6.6	5.8
EVR-53	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	2.7	1.9	0.4	14.5	12.6
EVR-54	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	3.2	2.4	0.0	0.0	0.2	0.0	17.0	16.9
EVR-55	0.0	0.0	0.0	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	19.1	3.6	1.9	39.7	36.1
EVR-550	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.1	0.4	0.0	2.4	2.1
EVR-551	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.6	0.0	0.0	3.1	3.1
EVR-552	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.0	2.0	1.9
EVR-553	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.3	0.4	0.0	4.8	4.4
EVR-56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EVR-6	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	10.5	1.7	0.0	0.0	0.6	0.0	16.6	16.0
EVR-7	0.0	0.0	1.0	72.5	0.0	0.0	0.0	0.0	0.0	2.2	3.3	0.0	0.0	0.0	0.9	0.0	79.9	79.0
EVR-8	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.3	0.0	28.7	28.4
exit 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	4.2	4.2
exit 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.6	3.6
exit 3a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	9.0	9.0
exit 3b	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	4.2	0.0	0.0	9.4	9.4
exit 4	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.1	0.0	0.0	23.1	23.1
exit 5	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
exit 6	0.0	0.0	0.0	57.3	0.0	0.0	0.0	0.0	0.0	5.3	0.0	247.4	158.9	4.5	0.0	411.2	884.6	884.6
exit 7	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.0	4.1	0.0	0.0	13.9	13.9
KL-1	0.0	0.0	0.0	153.8	0.0	0.2	2.3	0.0	0.0	20.4	15.3	0.1	0.0	8.6	1.6	0.0	202.3	200.7
KL-2	0.0	0.0	0.0	190.0	0.0	0.0	1.5	0.0	0.0	22.4	8.3	3.8	0.0	0.0	0.0	0.0	226.1	226.1
KL-20	0.0	0.0	0.0	75.9	0.0	0.0	0.4	0.0	0.0	23.9	4.5	0.0	0.0	0.1	0.0	0.0	104.8	104.8
KL-3	0.0	0.0	0.0	100.1	0.0	0.0	0.0	0.0	0.0	0.2	5.9	4.6	0.0	0.3	2.5	0.0	113.4	111.0
KL-300	0.0	0.0	0.0	49.9	16.9	0.0	0.0	0.2	0.0	3.5	4.2	7.3	0.0	0.0	0.0	0.0	82.0	82.0
KL-4	2.5	0.1	0.0	1.9	3.2	0.0	0.0	44.3	0.0	1.8	0.0	0.0	0.0	18.4	1.5	0.0	73.7	72.2
LL-1	0.0	0.0	0.0	84.4	0.0	0.0	0.0	0.0	0.0	0.6	5.7	4.5	0.0	1.2	59.7	0.0	156.1	96.3
WVR-1	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.6	6.3
WVR-10	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.6	0.0	9.5	8.9
WVR-11	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.3	0.0	8.5	8.2
WVR-111	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	12.2	12.0
WVR-112	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.3	11.3
WVR-113	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	12.4	12.3
WVR-12	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.4	0.2	0.0	2.4	2.2
WVR-13	0.0	0.0	0.0	36.6	0.0	0.3	0.0	1.4	0.0	3.6	3.2	7.7	0.0	38.3	0.0	0.0	91.0	91.0
WVR-130	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	2.6	2.8	0.0	0.0	2.8	0.1	0.0	15.4	15.4
WVR-14	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.9	2.1	11.9	10.9
WVR-15	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.4	0.0	8.3	8.0
WVR-16	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.1	0.0	7.0	6.9
WVR-17	0.0	1.1	0.0	111.0	0.0	16.2	0.0	0.9	0.0	0.3	1.3	39.4	0.0	32.1	4.0	0.0	206.2	202.2
WVR-170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.1	0.0	2.0	1.9
WVR-171	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3	0.0	2.5	2.2
WVR-172	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	3.7	3.7
WVR-18	0.0	8.9	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.5	0.0	20.7	20.2
WVR-19	0.0	0.0	0.0	45.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.2	0.0	57.0	56.8
WVR-190	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.7	13.6
WVR-191	0.0	0.0	0.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	2.5	0.0	0.0	19.8	19.8

BASELINE CONDITION (1990)

Watershed ID	Land Use Category																TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	PARK	OPEN	GOLF	ROW	WAT	ZOO		
WVR-2	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	4.2	3.7
WVR-20	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	9.4
WVR-201	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.7	13.6
WVR-202	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7
WVR-21	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	25.0	24.8
WVR-22	0.0	0.0	0.0	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	3.0	1.3	0.0	70.6	69.4
WVR-23	0.0	2.5	0.0	102.2	0.1	11.3	0.0	0.0	0.0	0.0	0.0	12.8	0.0	19.2	0.1	0.0	148.3	148.2
WVR-230	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	10.8	10.8
WVR-231	0.0	0.0	0.0	6.4	0.0	2.5	0.0	0.0	0.0	0.0	1.2	5.2	0.0	0.0	1.1	0.0	16.4	15.3
WVR-24	0.0	0.0	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.7	24.7
WVR-25	0.0	0.0	0.0	1.7	5.6	0.0	0.0	2.1	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	11.1	11.1
WVR-26	0.0	1.1	0.0	89.8	24.7	3.0	0.0	14.8	0.0	4.7	8.1	6.8	0.0	16.4	1.0	0.0	170.6	169.6
WVR-27	25.7	0.0	0.0	21.1	4.0	0.0	0.0	1.3	0.0	0.0	0.0	2.3	0.0	0.0	1.7	0.0	56.2	54.5
WVR-28	3.8	4.8	130.1	139.3	9.8	6.5	1.1	154.5	0.4	29.4	10.9	7.9	0.0	48.8	0.0	0.0	547.3	547.3
WVR-280	9.6	0.0	148.4	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	161.0	161.0
WVR-281	16.8	0.0	3.0	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	21.1	21.1
WVR-29	0.0	12.8	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.2	1.1	0.0	52.9	51.8
WVR-290	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	8.4	8.4
WVR-291	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	4.7	4.7
WVR-292	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	4.1	4.0
WVR-3	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.2	3.1
WVR-30	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0	1.6	0.0	0.5	1.0	0.0	16.9	15.9
WVR-31	0.0	1.2	0.0	6.4	0.0	0.0	0.0	0.0	0.0	13.4	0.0	2.8	0.0	0.0	0.0	0.0	23.7	23.7
WVR-32	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.6
WVR-320	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	5.1
WVR-321	0.0	0.0	45.6	13.7	0.0	0.0	0.0	0.0	0.0	0.1	0.1	5.0	0.0	0.0	0.0	0.0	64.6	64.6
WVR-322	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.7	3.7
WVR-33	0.0	0.0	0.0	52.5	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.9	1.0	0.0	63.7	62.7
WVR-34	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.6	2.6
WVR-35	0.0	0.0	0.0	17.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	17.4
WVR-36	0.0	0.3	0.0	147.2	0.0	0.0	0.0	0.0	0.0	7.2	20.6	0.6	0.0	7.8	2.8	0.0	186.5	183.7
WVR-37	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	12.3	12.3
WVR-370	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.2
WVR-38	0.0	0.0	0.0	28.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	28.6	28.3
WVR-4	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	2.2	0.0	0.0	14.8	14.8
WVR-40	0.0	0.0	0.0	166.0	0.0	9.4	0.0	0.0	0.0	75.5	10.5	6.9	0.0	5.5	3.7	0.0	277.5	273.8
WVR-41	0.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0	0.0	21.6	0.0	0.0	0.0	0.0	0.9	0.0	70.1	69.2
WVR-42	2.8	0.0	0.0	33.1	0.6	0.0	0.6	6.9	0.0	1.5	9.4	3.9	0.0	9.0	0.7	0.0	68.4	67.7
WVR-4333	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	12.7	11.7
WVR-4334	8.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	9.0	9.0
WVR-4335	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	8.4
WVR-4336	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	6.1
WVR-4337	20.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	20.5	20.2
WVR-4338	20.3	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	22.9	22.9
WVR-44	47.5	5.6	0.0	0.0	0.0	0.0	0.0	13.9	0.0	0.5	0.0	15.0	0.0	9.7	0.0	0.0	92.4	92.4
WVR-440	8.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.1	0.0	0.0	14.6	14.6
WVR-441	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	24.8
WVR-4410	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	5.4
WVR-4411	20.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.2	20.2
WVR-442	49.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	50.1	50.1
WVR-4420	15.8	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.1	17.1
WVR-4421	49.9	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	52.6

BASELINE CONDITION (1990)

Watershed ID	Land Use Category																TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	PARK	OPEN	GOLF	ROW	WAT	ZOO		
WVR-4422	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	11.5
WVR-4423	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	16.0
WVR-443	124.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.0	19.6	0.0	0.0	163.5	163.5
WVR-4430	15.7	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	1.0	0.0	0.0	26.7	26.7
WVR-4431	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4
WVR-4432	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
WVR-45	100.4	0.0	19.1	7.3	0.0	0.0	0.0	74.2	0.0	0.5	0.0	0.0	0.0	9.6	0.0	0.0	211.2	211.2
WVR-46	0.2	0.0	0.0	2.6	25.0	0.0	0.0	0.6	0.0	15.9	0.0	4.8	0.0	5.7	1.8	0.0	56.7	54.9
WVR-47	0.0	0.0	0.0	36.7	41.0	0.0	0.0	0.0	0.0	0.1	0.0	19.5	0.0	0.1	0.0	0.0	97.4	97.4
WVR-48	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0	0.0	14.1	14.1
WVR-49	0.0	0.0	0.0	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.5	0.3	0.0	30.2	30.0
WVR-5	0.0	0.0	0.0	32.3	0.0	5.7	0.0	0.0	0.0	0.0	3.6	0.0	0.0	1.2	8.9	0.0	51.7	42.8
WVR-50	40.6	0.0	0.0	54.5	1.2	0.0	0.0	0.0	0.0	0.3	0.0	2.9	0.0	17.8	0.0	0.0	117.3	117.3
WVR-52	39.5	10.3	80.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	2.6	0.0	0.0	136.0	136.0
WVR-53	124.5	2.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	7.6	0.0	0.0	141.7	141.7
WVR-54	76.2	1.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.9	0.0	1.1	0.0	0.0	106.3	106.3
WVR-55	23.1	0.0	3.5	0.0	0.0	0.0	0.0	0.0	79.8	0.0	0.0	17.1	0.0	5.7	1.0	0.0	130.1	129.1
WVR-56	54.6	6.8	82.9	0.0	0.0	0.0	0.0	0.0	8.5	0.0	0.0	18.7	0.0	0.0	0.0	0.0	171.5	171.5
WVR-560	0.2	1.2	3.2	12.8	0.0	0.0	0.0	0.0	0.0	21.1	40.6	0.0	0.0	0.2	1.0	0.0	80.3	79.3
WVR-57	0.1	0.0	0.6	0.0	0.0	0.0	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.8	19.8
WVR-58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	4.3	4.3
WVR-59	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	5.8	15.3	10.9
WVR-590	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	15.7	22.1	18.1
WVR-6	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.9	0.0	0.0	8.4	8.4
WVR-60	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	3.4	3.0
WVR-7	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	12.2	12.2
WVR-710	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	8.4	8.4
WVR-711	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.0	9.2	8.1
WVR-8	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	15.4	15.2
WVR-9	0.0	0.0	0.0	37.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.3	0.0	39.2	37.9
TOTALS	1531.4	144.5	717.7	4648.5	216.2	69.7	17.1	318.4	137.5	366.2	301.0	1097.3	215.4	597.3	356.8	452.7	11187.6	10830.8

PRESENT CONDITION (2005)

Watershed ID	Land Use Category																	TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
AL-1	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	3.8	3.3
AL-100	0.0	0.0	0.0	0.3	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	11.1	10.7
AL-11	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.1	0.5	0.0	21.0	20.5
AL-12	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.4	0.0	9.5	9.0
AL-13	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.1	0.4	0.0	7.9	7.5
AL-14	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	7.4	7.2
AL-2	0.0	0.0	0.0	1.1	37.7	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	1.0	0.0	56.7	55.7
AL-200	0.0	0.0	0.0	0.0	1.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	1.9	1.8
AL-201	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.1	0.0	4.2	4.2
AL-202	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.5	0.0	10.2	9.7
AL-3	0.0	0.0	0.0	1.3	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.0	11.6	11.3
AL-4	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	13.0	12.7
AL-5	0.0	0.0	0.0	36.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.7	2.2	0.9	0.0	40.9	40.0
AL-6	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.7	0.0	22.4	21.7
AL-7	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	2.6	2.1
AL-8	0.0	0.0	0.0	23.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	4.0	0.9	0.0	42.6	41.7
AL-9	0.0	0.0	0.0	70.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	72.3	0.0	0.5	44.0	0.0	194.3	150.2
BD-1	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	30.6	30.5
BD-10	0.0	0.0	0.0	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	1.3	0.0	32.1	30.9
BD-100	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.0	2.8
BD-101	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
BD-102	0.0	0.0	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	26.6	26.4
BD-103	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	2.7	2.6
BD-104	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.6	1.6
BD-11	0.0	0.0	0.0	27.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.9	0.8	0.0	32.1	31.2
BD-110	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.4	0.0	3.7	3.3
BD-12	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	3.1	2.6
BD-120	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	2.0	2.0
BD-13	0.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	9.4	8.4
BD-14	0.0	0.0	0.0	37.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	1.7	1.8	0.0	43.8	42.0
BD-140	0.0	0.0	0.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	2.5	0.9	0.0	18.8	17.9
BD-15	0.0	0.0	0.0	45.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	1.4	0.1	0.0	47.5	47.3
BD-150	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	6.8	6.8
BD-2	0.0	0.0	0.0	16.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.7	0.0	21.3	20.6
BD-3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6
BD-4	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	6.1	6.0
BD-5	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	25.2	25.0
BD-6	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	4.6	4.5
BD-61	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	12.2	12.0
BD-7	0.0	0.0	0.0	58.9	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.1	2.4	0.0	0.0	0.2	0.0	63.1	62.9
BD-70	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	6.2	6.2
BD-71	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4
BD-8	0.0	0.0	0.0	5.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	8.5	8.1
BD-9	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	8.1	7.3
BD-90	0.0	0.0	0.0	2.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.8	0.0	9.0	8.2
EVR-1	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.5	0.0	3.8	0.9	0.0	19.1	18.2
EVR-10	0.0	0.0	0.0	65.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	7.8	0.5	0.0	74.1	73.6
EVR-11	0.0	0.0	0.0	14.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.0	15.8	15.5
EVR-12	0.0	0.0	0.0	49.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.4	0.0	0.0	5.6	0.0	61.0	55.4
EVR-13	0.0	0.0	0.0	44.9	0.0	0.0	0.0	0.0	0.0	26.8	0.0	10.8	0.0	0.0	0.6	0.3	0.8	84.3	83.9
EVR-14	0.0	0.0	0.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.7	0.0	25.8	23.0
EVR-15	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	12.1

PRESENT CONDITION (2005)

Watershed ID	Land Use Category																	TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
EVR-150	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	7.8	6.8
EVR-151	0.0	0.0	0.0	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	23.5	23.3
EVR-16	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	7.1	6.9
EVR-160	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	6.8	6.7
EVR-17	0.0	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.3	0.0	5.8	0.0	0.0	0.5	34.0	0.0	83.4	49.4
EVR-170	0.0	0.0	0.0	67.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	2.2	0.4	0.0	18.0	7.5	0.0	95.7	88.2
EVR-18	0.0	0.0	0.0	46.3	0.9	0.0	0.0	0.0	0.0	5.4	0.0	0.0	3.0	0.0	8.5	2.2	0.0	66.3	64.1
EVR-180	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.3	0.6	0.0	13.1	12.5
EVR-19	0.0	0.0	0.0	57.3	3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	56.6	29.8	17.6	4.8	0.0	169.6	164.9
EVR-190	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.6	0.0	0.0	0.1	0.0	46.5	46.4
EVR-2	0.0	0.0	0.0	74.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.5	0.0	0.0	0.0	7.7	0.0	84.2	76.5
EVR-20	0.0	0.0	0.0	27.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	29.3	27.7
EVR-21	0.0	0.0	0.0	45.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	1.3	0.0	63.9	62.6
EVR-210	0.0	0.0	0.0	51.7	0.1	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.8	0.0	57.8	57.1
EVR-211	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	6.0	6.0
EVR-22	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.9	0.0	36.4	33.5
EVR-220	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.0	3.6	3.3
EVR-221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	1.1	0.0	0.0	7.0	7.0
EVR-24	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.9	11.8
EVR-25	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	11.9	0.0	1.8	0.0	0.0	0.1	0.2	0.0	14.3	14.1
EVR-26	0.0	0.0	0.0	43.2	0.0	0.0	0.0	0.0	0.0	24.1	0.0	7.0	0.1	0.0	1.9	2.0	0.0	78.3	76.3
EVR-27	0.0	0.0	0.0	79.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	3.8	0.0	1.1	0.5	0.0	90.7	90.2
EVR-28	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	5.7	5.7
EVR-280	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	0.0	6.2	5.7
EVR-29	0.0	0.0	0.0	90.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	11.3	2.2	0.0	113.0	110.8
EVR-290	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	9.5	8.9
EVR-3	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.4	0.0	15.8	15.4
EVR-30	0.0	0.0	0.0	36.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	37.8	36.9
EVR-31	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.0	6.1	6.0
EVR-32	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	2.8	2.5
EVR-33	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	7.1	5.9
EVR-34	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	0.0	14.2	12.3
EVR-35	0.0	0.0	0.0	61.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	6.2	67.0	0.0	142.2	75.2
EVR-350	0.0	0.0	0.0	33.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	0.0	0.0	0.3	0.2	0.0	42.4	42.2
EVR-351	0.0	0.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	21.5	21.5
EVR-352	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0	0.0	6.8	4.8
EVR-36	0.0	0.0	0.0	52.3	0.5	0.0	0.0	0.0	0.0	18.4	0.0	2.7	0.0	0.0	5.3	0.6	0.0	79.8	79.1
EVR-37	0.0	0.0	0.0	13.9	1.0	2.7	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	4.9	0.2	0.0	25.4	25.3
EVR-38	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	14.3	13.8
EVR-39	0.0	0.0	0.0	150.2	17.8	12.3	15.0	0.0	0.0	2.1	0.0	10.9	9.3	0.0	0.3	3.5	0.0	221.3	217.7
EVR-4	0.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	0.0	0.0	0.0	7.2	0.8	0.0	84.2	83.4
EVR-40	0.0	0.0	0.0	99.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	12.2	0.0	1.8	3.5	0.0	116.9	113.4
EVR-400	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	8.9	8.9
EVR-41	2.4	0.0	0.0	55.0	0.0	0.0	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.4	0.0	68.9	65.5
EVR-42	12.1	3.5	116.2	22.9	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	11.9	0.0	0.0	169.3	169.3
EVR-43	0.0	0.0	0.2	78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.5	0.0	89.8	89.3
EVR-430	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.0	0.0	13.2	13.2
EVR-44	0.0	0.0	180.5	78.0	15.3	8.4	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	15.2	33.6	0.0	334.4	300.8
EVR-440	0.4	1.0	0.0	0.2	5.6	0.0	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0	5.2	0.0	0.0	19.9	19.9
EVR-45	0.0	0.0	0.0	35.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	0.0	37.6	36.1
EVR-46	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	0.0	9.0	7.5
EVR-47	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.9	0.0	8.5	6.6

PRESENT CONDITION (2005)

Watershed ID	Land Use Category																	TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
EVR-48	28.4	0.0	0.0	0.9	31.4	0.0	0.0	0.0	83.3	0.1	0.0	0.0	2.4	0.0	10.5	3.0	0.0	160.0	157.0
EVR-49	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
EVR-5	0.0	0.0	0.0	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.5	0.0	79.3	78.8
EVR-50	0.0	0.0	0.0	35.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.4	0.8	39.9	37.5
EVR-51	0.0	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.4	1.7	22.8	22.4
EVR-52	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9	6.6	5.8
EVR-53	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	1.9	0.4	14.5	12.6
EVR-54	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	2.4	0.0	0.0	0.2	0.0	17.0	16.9
EVR-55	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	19.1	3.6	1.9	39.7	36.1
EVR-550	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.1	0.4	0.0	2.4	2.1
EVR-551	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.6	0.0	0.0	3.1	3.1
EVR-552	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.0	2.0	1.9
EVR-553	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.3	0.4	0.0	4.8	4.4
EVR-56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EVR-6	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	1.7	0.0	0.0	0.6	0.0	16.6	16.0
EVR-7	0.0	0.0	0.0	73.5	0.0	0.0	0.0	0.0	0.0	2.2	0.0	3.3	0.0	0.0	0.0	0.9	0.0	79.9	79.0
EVR-8	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.3	0.0	28.7	28.4
exit 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	4.2	4.2
exit 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.6	3.6
exit 3a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	9.0	9.0
exit 3b	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	9.4	9.4
exit 4	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.1	0.0	0.0	23.1	23.1
exit 5	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
exit 6	0.0	0.0	0.0	57.3	0.0	0.0	0.0	0.0	0.0	17.7	0.0	0.0	235.0	158.9	4.5	0.0	411.2	884.6	884.6
exit 7	0.0	0.0	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	13.9	13.9
KL-1	0.0	0.0	0.0	153.8	0.0	0.2	2.3	0.0	0.0	20.4	0.0	15.3	0.1	0.0	8.6	1.6	0.0	202.3	200.7
KL-2	0.0	0.0	0.0	190.0	0.0	0.0	1.5	0.0	0.0	22.4	0.0	11.2	1.0	0.0	0.0	0.0	0.0	226.1	226.1
KL-20	0.0	0.0	0.0	75.9	0.0	0.0	0.4	0.0	0.0	23.9	0.0	4.5	0.0	0.0	0.1	0.0	0.0	104.8	104.8
KL-3	0.0	0.0	0.0	100.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	5.8	4.6	0.0	0.3	2.5	0.0	113.4	110.9
KL-300	0.0	0.0	0.0	49.9	16.9	0.0	0.0	0.2	0.0	3.5	0.0	4.2	7.3	0.0	0.0	0.0	0.0	82.0	82.0
KL-4	0.0	0.0	0.0	1.9	3.2	0.0	0.0	46.9	0.0	1.8	0.0	0.0	0.0	0.0	18.4	1.5	0.0	73.7	72.2
LL-1	0.0	0.0	0.0	84.4	0.0	0.0	0.0	0.0	0.0	0.6	0.0	6.6	3.7	0.0	1.2	59.7	0.0	156.2	96.4
WVR-1	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.6	6.3
WVR-10	0.0	0.0	0.0	8.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	9.5	8.9
WVR-11	0.0	0.0	0.0	4.8	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	8.5	8.2
WVR-111	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	12.2	12.0
WVR-112	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.3	11.3
WVR-113	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	12.4	12.3
WVR-12	0.0	0.0	0.0	0.3	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	2.4	2.2
WVR-13	0.0	0.0	0.0	36.6	7.5	0.5	0.0	1.4	0.0	3.6	0.0	3.2	0.0	0.0	38.3	0.0	0.0	91.0	91.0
WVR-130	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	2.6	0.0	2.8	0.0	0.0	2.8	0.1	0.0	15.4	15.4
WVR-14	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.9	2.1	11.9	10.9
WVR-15	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.4	0.0	8.3	8.0
WVR-16	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.1	0.0	7.0	6.9
WVR-17	0.0	0.0	0.0	128.9	0.0	34.5	0.0	0.9	0.0	0.3	0.0	1.3	4.3	0.0	32.1	4.0	0.0	206.2	202.2
WVR-170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.1	0.0	2.0	1.9
WVR-171	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3	0.0	2.5	2.2
WVR-172	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	3.7	3.7
WVR-18	0.0	0.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.5	0.0	20.7	20.2
WVR-19	0.0	0.0	0.0	45.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.2	0.0	57.0	56.8
WVR-190	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.7	13.6
WVR-191	0.0	0.0	0.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	19.8	19.8

PRESENT CONDITION (2005)

Watershed ID	Land Use Category																	TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
WVR-2	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	4.2	3.7
WVR-20	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	9.4
WVR-201	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.7	13.6
WVR-202	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7
WVR-21	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	25.0	24.8
WVR-22	0.0	0.0	0.0	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	3.0	1.3	0.0	70.6	69.4
WVR-23	0.0	0.0	0.0	102.2	6.3	18.5	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	19.2	0.1	0.0	148.3	148.2
WVR-230	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	10.8	10.8
WVR-231	0.0	0.0	0.0	6.4	0.0	2.5	0.0	0.0	0.0	0.0	0.0	1.2	5.2	0.0	0.0	1.1	0.0	16.4	15.3
WVR-24	0.0	0.0	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.7	24.7
WVR-25	0.0	0.0	0.0	1.1	5.6	0.0	0.0	2.7	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	11.1
WVR-26	0.0	0.0	0.0	89.1	24.7	9.3	0.0	15.6	0.0	4.7	0.0	8.1	1.6	0.0	16.4	1.0	0.0	170.6	169.6
WVR-27	0.0	0.0	0.0	21.1	4.0	0.0	0.0	27.1	0.0	0.0	0.0	0.0	2.3	0.0	0.0	1.7	0.0	56.2	54.5
WVR-28	0.0	0.1	0.0	143.1	9.8	22.8	1.1	247.2	0.4	32.1	0.0	10.9	24.2	0.0	48.8	6.8	0.0	547.3	540.5
WVR-280	0.0	0.0	0.0	136.3	0.0	4.5	0.0	4.4	0.2	0.0	0.0	8.9	0.0	0.0	0.2	6.5	0.0	161.0	154.5
WVR-281	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.2	0.1	0.0	21.1	21.0
WVR-29	0.0	0.0	0.0	9.8	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.2	1.1	0.0	52.9	51.8
WVR-290	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	8.4	8.4
WVR-291	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	4.7	4.7
WVR-292	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	4.1	4.0
WVR-3	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.2	3.1
WVR-30	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	1.6	0.0	0.5	1.0	0.0	16.9	15.9
WVR-31	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.7	23.7
WVR-32	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.6
WVR-320	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	5.1	4.5
WVR-321	0.0	0.0	0.0	52.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	9.1	0.0	0.0	3.0	0.0	64.6	61.6
WVR-322	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	3.7	3.6
WVR-33	0.0	0.0	0.0	52.5	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.9	1.0	0.0	63.7	62.7
WVR-34	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.6	2.6
WVR-35	0.0	0.0	0.0	17.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	17.4
WVR-36	0.0	0.0	0.0	147.5	0.0	0.0	0.0	0.0	0.0	7.2	0.0	20.6	0.6	0.0	7.8	2.8	0.0	186.5	183.7
WVR-37	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	12.3	12.3
WVR-370	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.2
WVR-38	0.0	0.0	0.0	28.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	28.6	28.3
WVR-4	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	14.8	14.8
WVR-40	0.0	0.0	0.0	166.0	0.0	9.4	0.0	0.0	0.0	75.5	0.0	10.5	6.9	0.0	5.5	3.7	0.0	277.5	273.8
WVR-41	0.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0	0.0	21.6	0.0	0.0	0.0	0.0	0.0	0.9	0.0	70.1	69.2
WVR-42	0.0	0.0	0.0	33.1	0.6	0.0	0.6	13.3	0.0	1.5	0.0	9.4	0.2	0.0	9.0	0.7	0.0	68.4	67.7
WVR-4333	0.2	0.0	0.5	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.5	0.0	0.0	1.0	0.0	12.7	11.7
WVR-4334	0.3	0.0	0.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.4	0.0	9.0	8.6
WVR-4335	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	8.4	8.0
WVR-4336	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.1	5.7
WVR-4337	0.0	0.0	0.0	19.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	20.5	20.2
WVR-4338	20.2	0.0	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.9	22.9
WVR-44	0.0	0.0	0.0	7.0	0.2	0.0	0.0	73.8	0.0	0.5	0.0	0.0	0.0	0.0	9.7	1.1	0.0	92.4	91.3
WVR-440	3.3	0.0	0.9	8.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.1	0.0	14.6	13.6
WVR-441	1.0	0.0	0.0	17.4	3.5	0.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	24.8	24.1
WVR-4410	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	5.4	5.1
WVR-4411	0.0	0.0	0.0	0.0	5.2	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	20.2	19.0
WVR-442	0.0	0.0	0.0	5.5	11.4	31.4	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.0	50.1	49.2
WVR-4420	0.0	0.0	0.0	5.1	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	17.1	17.0
WVR-4421	0.0	0.0	0.0	0.0	40.4	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	52.6	51.0

PRESENT CONDITION (2005)

Watershed ID	Land Use Category																	TOTALS	TOTALS W/O WATER
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens		
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
WVR-4422	0.0	0.0	0.0	3.7	6.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.5	11.4
WVR-4423	0.0	0.0	0.0	6.5	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	16.0	15.8
WVR-443	52.8	4.1	24.2	47.0	2.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	7.4	0.0	19.6	5.8	0.0	163.5	157.7
WVR-4430	0.0	2.9	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	26.7	26.7
WVR-4431	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	3.4	3.0
WVR-4432	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	1.3	1.0
WVR-45	0.0	0.0	0.0	7.3	0.1	31.8	0.0	132.9	0.0	0.5	0.0	0.0	24.8	0.0	9.6	4.2	0.0	211.2	207.0
WVR-46	0.0	0.0	0.0	2.6	25.0	0.0	0.0	5.6	0.0	15.9	0.0	0.0	0.0	0.0	5.7	1.8	0.0	56.7	54.9
WVR-47	0.0	0.0	0.0	36.7	45.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	14.3	0.0	0.1	0.7	0.0	97.4	96.7
WVR-48	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	14.1	13.5
WVR-49	0.0	0.0	0.0	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.5	0.3	0.0	30.2	30.0
WVR-5	0.0	0.0	0.0	32.3	0.0	5.7	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	1.2	8.9	0.0	51.7	42.8
WVR-50	0.0	0.0	0.0	65.9	2.5	16.8	0.0	3.6	0.0	0.3	0.0	4.7	0.2	0.0	18.8	4.4	0.0	117.3	112.9
WVR-52	34.3	0.0	99.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	136.0	136.0
WVR-53	52.3	0.0	77.3	0.0	0.0	0.0	0.0	0.0	0.6	3.9	0.0	0.0	0.0	0.0	7.6	0.0	0.0	141.7	141.7
WVR-54	0.1	0.0	103.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	1.1	0.0	0.0	106.3	106.3
WVR-55	22.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.5	0.0	0.0	0.0	20.6	0.0	5.7	1.0	0.0	130.1	129.1
WVR-56	34.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0	13.5	59.7	0.0	57.4	0.5	0.0	0.0	4.5	0.0	171.5	167.0
WVR-560	0.2	0.0	0.0	12.8	0.0	0.0	0.0	0.0	0.0	21.9	0.0	44.2	0.0	0.0	0.2	1.0	0.0	80.3	79.3
WVR-57	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.8	19.8
WVR-58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.4	4.3	3.4
WVR-59	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	5.8	15.3	10.9
WVR-590	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	15.7	22.1	18.1
WVR-6	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.0	8.4	7.4
WVR-60	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	3.4	3.0
WVR-7	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	12.2	12.2
WVR-710	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	8.4	8.4
WVR-711	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.0	9.2	8.1
WVR-8	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	15.4	15.2
WVR-9	0.0	0.0	0.0	37.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.3	0.0	39.2	37.9
TOTALS	264.9	12.7	628.7	5476.3	457.5	228.7	33.0	608.2	198.2	493.9	0.0	402.0	621.7	215.3	643.6	451.3	451.7	11187.7	10736.4

ULTIMATE CONDITION (2020)

Watershed ID	Land Use Category																		
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens	**TOTALS**	TOTALS W/O WATER
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
AL-1	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	3.8	3.3
AL-100	0.0	0.0	0.0	0.3	10.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	11.1	10.7
AL-11	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.1	0.5	0.0	21.0	20.5
AL-12	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.4	0.0	9.5	9.0
AL-13	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.1	0.4	0.0	7.9	7.5
AL-14	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	7.4	7.2
AL-2	0.0	0.0	0.0	1.1	37.7	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	1.0	0.0	56.7	55.7
AL-200	0.0	0.0	0.0	0.0	1.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	1.9	1.8
AL-201	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.1	0.0	4.2	4.2
AL-202	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.5	0.0	10.2	9.7
AL-3	0.0	0.0	0.0	1.3	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.0	11.6	11.3
AL-4	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	13.0	12.7
AL-5	0.0	0.0	0.0	36.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.7	2.2	0.9	0.0	40.9	40.0
AL-6	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.7	0.0	22.4	21.7
AL-7	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	2.6	2.1
AL-8	0.0	0.0	0.0	23.1	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	4.0	0.8	0.0	42.6	41.8
AL-9	0.0	0.0	0.0	70.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	72.3	0.0	0.5	44.0	0.0	194.3	150.2
BD-1	0.0	0.0	0.0	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	30.6	30.5
BD-10	0.0	0.0	0.0	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	1.3	0.0	32.1	30.9
BD-100	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	3.0	2.8
BD-101	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6
BD-102	0.0	0.0	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	26.6	26.4
BD-103	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	2.7	2.6
BD-104	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	1.6	1.6
BD-11	0.0	0.0	0.0	27.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.9	0.8	0.0	32.1	31.2
BD-110	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.4	0.0	3.7	3.3
BD-12	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	3.1	2.6
BD-120	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	2.0	2.0
BD-13	0.0	0.0	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	9.4	8.4
BD-14	0.0	0.0	0.0	37.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	1.7	1.8	0.0	43.8	42.0
BD-140	0.0	0.0	0.0	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	2.5	0.9	0.0	18.8	17.9
BD-15	0.0	0.0	0.0	45.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	1.4	0.1	0.0	47.5	47.3
BD-150	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	6.8	6.8
BD-2	0.0	0.0	0.0	16.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.7	0.0	21.3	20.6
BD-3	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6
BD-4	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	6.1	6.0
BD-5	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	25.2	25.0
BD-6	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	4.6	4.5
BD-61	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	12.2	12.0
BD-7	0.0	0.0	0.0	58.9	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.1	2.4	0.0	0.0	0.2	0.0	63.1	62.9
BD-70	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	6.2	6.2
BD-71	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	3.4
BD-8	0.0	0.0	0.0	5.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	8.5	8.1
BD-9	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	8.1	7.3
BD-90	0.0	0.0	0.0	2.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.8	0.0	9.0	8.2
EVR-1	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.5	0.0	3.8	0.9	0.0	19.1	18.2
EVR-10	0.0	0.0	0.0	65.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	7.8	0.5	0.0	74.1	73.6
EVR-11	0.0	0.0	0.0	14.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.0	15.8	15.5
EVR-12	0.0	0.0	0.0	49.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.4	0.0	0.0	5.6	0.0	61.0	55.4
EVR-13	0.0	0.0	0.0	44.9	0.0	0.0	0.0	0.0	0.0	26.8	0.0	10.7	0.0	0.0	0.6	0.5	0.8	84.3	83.8
EVR-14	0.0	0.0	0.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.7	0.0	25.8	23.0
EVR-15	0.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	12.1

ULTIMATE CONDITION (2020)

Watershed ID	Land Use Category																		
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens	**TOTALS**	TOTALS W/O WATER
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
EVR-150	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	7.8	6.8
EVR-151	0.0	0.0	0.0	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	23.5	23.3
EVR-16	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	7.1	6.9
EVR-160	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	6.8	6.7
EVR-17	0.0	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.3	0.0	5.6	0.0	0.0	0.5	34.1	0.0	83.4	49.3
EVR-170	0.0	0.0	0.0	67.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	2.2	0.4	0.0	18.0	7.5	0.0	95.7	88.2
EVR-18	0.0	0.0	0.0	46.3	0.9	0.0	0.0	0.0	0.0	5.4	0.0	0.0	3.0	0.0	8.5	2.2	0.0	66.3	64.1
EVR-180	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.3	0.6	0.0	13.1	12.5
EVR-19	0.0	0.0	0.0	57.3	3.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	56.6	29.8	17.6	4.8	0.0	169.6	164.9
EVR-190	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.6	0.0	0.0	0.1	0.0	46.5	46.4
EVR-2	0.0	0.0	0.0	74.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.5	0.0	0.0	0.0	7.7	0.0	84.2	76.5
EVR-20	0.0	0.0	0.0	27.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	29.3	27.7
EVR-21	0.0	0.0	0.0	45.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	1.3	0.0	63.9	62.6
EVR-210	0.0	0.0	0.0	51.7	0.1	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.8	0.0	57.8	57.1
EVR-211	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	6.0	6.0
EVR-22	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.9	0.0	36.4	33.5
EVR-220	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.3	0.0	3.6	3.3
EVR-221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	1.1	0.0	0.0	7.0	7.0
EVR-24	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.9	11.8
EVR-25	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	11.9	0.0	1.8	0.0	0.0	0.1	0.2	0.0	14.3	14.1
EVR-26	0.0	0.0	0.0	43.2	0.0	0.0	0.0	0.0	0.0	24.1	0.0	7.0	0.1	0.0	1.9	2.0	0.0	78.3	76.3
EVR-27	0.0	0.0	0.0	79.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	3.8	0.0	1.1	0.5	0.0	90.7	90.2
EVR-28	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	5.7	5.7
EVR-280	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	0.0	6.2	5.7
EVR-29	0.0	0.0	0.0	90.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	11.3	2.2	0.0	113.0	110.8
EVR-290	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	9.5	8.9
EVR-3	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.0	0.0	0.4	0.0	15.8	15.4
EVR-30	0.0	0.0	0.0	36.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	37.8	36.9
EVR-31	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.0	6.1	6.0
EVR-32	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	2.8	2.5
EVR-33	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	7.1	5.9
EVR-34	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	0.0	14.2	12.3
EVR-35	0.0	0.0	0.0	61.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	6.2	67.0	0.0	142.2	75.2
EVR-350	0.0	0.0	0.0	33.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	0.0	0.0	0.3	0.2	0.0	42.4	42.2
EVR-351	0.0	0.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	21.5	21.5
EVR-352	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.0	0.0	6.8	4.8
EVR-36	0.0	0.0	0.0	52.3	0.5	0.0	0.0	0.0	0.0	18.4	0.0	2.7	0.0	0.0	5.3	0.6	0.0	79.8	79.1
EVR-37	0.0	0.0	0.0	13.9	1.0	2.7	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	4.9	0.2	0.0	25.4	25.3
EVR-38	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	14.3	13.8
EVR-39	0.0	0.0	0.0	150.2	17.8	12.3	15.0	0.0	0.0	2.1	0.0	10.9	9.3	0.0	0.3	3.5	0.0	221.3	217.7
EVR-4	0.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0	0.3	0.8	0.0	0.0	0.0	0.0	7.2	0.8	0.0	84.2	83.4
EVR-40	0.0	0.0	0.0	99.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	12.2	0.0	1.8	3.5	0.0	116.9	113.4
EVR-400	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	8.9	8.9
EVR-41	0.0	0.0	0.0	55.0	2.4	0.0	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.4	0.0	68.9	65.5
EVR-42	0.0	0.0	0.0	59.3	81.3	0.0	1.0	0.0	0.0	2.8	0.0	13.1	0.0	0.0	11.9	0.0	0.0	169.3	169.3
EVR-43	0.0	0.0	0.0	78.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.5	0.0	89.8	89.3
EVR-430	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.0	0.0	13.2	13.2
EVR-44	0.0	0.0	0.0	112.9	95.3	18.3	21.8	27.9	0.0	0.0	0.0	9.3	0.0	0.0	15.2	33.6	0.0	334.4	300.8
EVR-440	0.0	0.0	0.0	0.2	6.6	0.0	0.0	0.0	0.0	7.5	0.4	0.0	0.0	0.0	5.2	0.0	0.0	19.9	19.9
EVR-45	0.0	0.0	0.0	35.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	0.0	37.6	36.1
EVR-46	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	0.0	9.0	7.5
EVR-47	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.9	0.0	8.5	6.6

ULTIMATE CONDITION (2020)

Watershed ID	Land Use Category																		
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens	**TOTALS**	TOTALS W/O WATER
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
EVR-48	0.0	0.0	0.0	0.9	31.4	0.0	0.0	0.0	114.3	0.1	0.0	0.0	0.0	0.0	10.5	3.0	0.0	160.2	157.2
EVR-49	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.8
EVR-5	0.0	0.0	0.0	75.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.5	0.0	79.3	78.8
EVR-50	0.0	0.0	0.0	35.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.4	0.8	39.9	37.5
EVR-51	0.0	0.0	0.0	19.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.4	1.7	22.8	22.4
EVR-52	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.9	6.6	5.8
EVR-53	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	1.9	0.4	14.5	12.6
EVR-54	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	2.4	0.0	0.0	0.2	0.0	17.0	16.9
EVR-55	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	19.1	3.6	1.9	39.7	36.1
EVR-550	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.1	0.4	0.0	2.4	2.1
EVR-551	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.6	0.0	0.0	3.1	3.1
EVR-552	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.0	2.0	1.9
EVR-553	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.3	0.4	0.0	4.8	4.4
EVR-56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EVR-6	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	1.7	0.0	0.0	0.6	0.0	16.6	16.0
EVR-7	0.0	0.0	0.0	73.5	0.0	0.0	0.0	0.0	0.0	2.2	0.0	3.3	0.0	0.0	0.0	0.9	0.0	79.9	79.0
EVR-8	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.3	0.0	28.7	28.4
exit 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	4.2	4.2
exit 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.6	3.6
exit 3a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	9.0	9.0
exit 3b	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	9.4	9.4
exit 4	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.1	0.0	0.0	23.1	23.1
exit 5	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
exit 6	0.0	0.0	0.0	57.3	0.0	0.0	0.0	0.0	0.0	17.7	0.0	0.0	235.0	158.9	4.5	0.0	411.2	884.6	884.6
exit 7	0.0	0.0	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	13.9	13.9
KL-1	0.0	0.0	0.0	153.8	0.0	0.2	2.3	0.0	0.0	20.4	0.0	15.3	0.1	0.0	8.6	1.6	0.0	202.3	200.7
KL-2	0.0	0.0	0.0	190.0	0.0	0.0	1.5	0.0	0.0	22.4	0.0	10.6	1.0	0.0	0.0	0.6	0.0	226.1	225.5
KL-20	0.0	0.0	0.0	75.9	0.0	0.0	0.4	0.0	0.0	23.9	0.0	4.5	0.0	0.0	0.1	0.0	0.0	104.8	104.8
KL-3	0.0	0.0	0.0	100.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	5.9	4.6	0.0	0.3	2.5	0.0	113.4	111.0
KL-300	0.0	0.0	0.0	49.9	16.9	0.0	0.0	0.2	0.0	3.5	0.0	4.2	7.3	0.0	0.0	0.0	0.0	82.0	82.0
KL-4	0.0	0.0	0.0	1.9	3.2	0.0	0.0	46.9	0.0	1.8	0.0	0.0	0.0	0.0	18.4	1.5	0.0	73.7	72.2
LL-1	0.0	0.0	0.0	84.4	0.0	0.0	0.0	0.0	0.0	0.6	0.0	6.5	3.7	0.0	1.2	59.7	0.0	156.1	96.3
WVR-1	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.6	6.3
WVR-10	0.0	0.0	0.0	8.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	9.5	8.9
WVR-11	0.0	0.0	0.0	4.8	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	8.5	8.2
WVR-111	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	12.2	12.0
WVR-112	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.3	11.3
WVR-113	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	12.4	12.3
WVR-12	0.0	0.0	0.0	0.3	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	2.4	2.2
WVR-13	0.0	0.0	0.0	36.6	7.5	0.5	0.0	1.4	0.0	3.6	0.0	3.2	0.0	0.0	38.3	0.0	0.0	91.0	91.0
WVR-130	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	2.6	0.0	2.8	0.0	0.0	2.8	0.1	0.0	15.4	15.4
WVR-14	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.9	2.1	11.9	10.9
WVR-15	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.4	0.0	8.3	8.0
WVR-16	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.1	0.0	7.0	6.9
WVR-17	0.0	0.0	0.0	128.9	0.0	34.5	0.0	0.9	0.0	0.3	0.0	1.3	4.3	0.0	32.1	4.0	0.0	206.2	202.2
WVR-170	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.1	0.0	2.0	1.9
WVR-171	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3	0.0	2.5	2.2
WVR-172	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	3.7	3.7
WVR-18	0.0	0.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.5	0.0	20.7	20.2
WVR-19	0.0	0.0	0.0	45.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.2	0.0	57.0	56.8
WVR-190	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.7	13.6
WVR-191	0.0	0.0	0.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	19.8	19.8

ULTIMATE CONDITION (2020)

Watershed ID	Land Use Category																		
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens	**TOTALS**	TOTALS W/O WATER
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
WVR-2	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	4.2	3.7
WVR-20	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	9.4
WVR-201	0.0	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	13.7	13.6
WVR-202	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.7
WVR-21	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	25.0	24.8
WVR-22	0.0	0.0	0.0	64.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	3.0	1.3	0.0	70.6	69.4
WVR-23	0.0	0.0	0.0	102.2	8.2	18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.2	0.1	0.0	148.3	148.2
WVR-230	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	10.8	10.8
WVR-231	0.0	0.0	0.0	6.4	0.0	2.5	0.0	0.0	0.0	0.0	0.0	1.2	5.2	0.0	0.0	1.1	0.0	16.4	15.3
WVR-24	0.0	0.0	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.7	24.7
WVR-25	0.0	0.0	0.0	1.1	5.6	0.0	0.0	2.7	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	11.1
WVR-26	0.0	0.0	0.0	89.1	25.9	9.3	0.0	15.5	0.0	4.7	0.0	8.1	0.0	0.0	16.4	1.5	0.0	170.6	169.1
WVR-27	0.0	0.0	0.0	21.1	4.0	0.0	0.0	27.1	0.0	0.0	0.0	0.0	2.3	0.0	0.0	1.7	0.0	56.2	54.5
WVR-28	0.0	0.0	0.0	143.1	9.8	22.8	1.1	254.9	16.5	32.1	0.0	10.9	0.3	0.0	48.8	6.8	0.0	547.0	540.3
WVR-280	0.0	0.0	0.0	136.5	0.0	4.5	0.0	4.4	0.0	0.0	0.0	8.9	0.0	0.0	0.2	6.5	0.0	161.0	154.4
WVR-281	0.0	0.0	0.0	20.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.2	0.1	0.0	21.1	21.0
WVR-29	0.0	0.0	0.0	9.8	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.2	1.1	0.0	52.9	51.8
WVR-290	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	8.4	8.4
WVR-291	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	4.7	4.7
WVR-292	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	4.1	4.0
WVR-3	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	3.2	3.1
WVR-30	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	1.6	0.0	0.5	1.0	0.0	16.9	15.9
WVR-31	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	12.7	0.0	0.0	0.0	0.0	0.0	0.6	0.0	23.7	23.1
WVR-32	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	4.6
WVR-320	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	5.1	4.5
WVR-321	0.0	0.0	0.0	52.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	9.1	0.0	0.0	3.0	0.0	64.6	61.6
WVR-322	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	3.7	3.6
WVR-33	0.0	0.0	0.0	52.5	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.9	1.0	0.0	63.7	62.7
WVR-34	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	2.6	2.6
WVR-35	0.0	0.0	0.0	17.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	17.4
WVR-36	0.0	0.0	0.0	147.5	0.0	0.0	0.0	0.0	0.0	7.2	0.0	20.6	0.6	0.0	7.8	2.8	0.0	186.5	183.7
WVR-37	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	12.3	12.3
WVR-370	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.2
WVR-38	0.0	0.0	0.0	28.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	28.6	28.3
WVR-4	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	14.8	14.8
WVR-40	0.0	0.0	0.0	166.0	0.0	9.4	0.0	0.0	0.0	75.5	0.0	10.5	6.9	0.0	5.5	3.7	0.0	277.5	273.8
WVR-41	0.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0	0.0	21.6	0.0	0.0	0.0	0.0	0.0	0.9	0.0	70.1	69.2
WVR-42	0.0	0.0	0.0	33.1	0.6	0.0	0.6	13.3	0.0	1.5	0.0	9.4	0.2	0.0	9.0	0.7	0.0	68.4	67.7
WVR-4333	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	1.0	0.0	12.7	11.7
WVR-4334	0.0	0.0	0.0	3.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.4	0.0	9.0	8.6
WVR-4335	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	8.4	8.0
WVR-4336	0.0	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.1	5.7
WVR-4337	0.0	0.0	0.0	19.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	20.5	20.2
WVR-4338	0.0	0.0	0.0	0.8	21.7	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	22.9	22.9
WVR-44	0.0	0.0	0.0	7.0	0.2	0.0	0.0	73.8	0.0	0.5	0.0	0.0	0.0	0.0	9.7	1.1	0.0	92.4	91.3
WVR-440	0.0	0.0	0.0	8.0	0.8	0.0	0.0	1.2	0.0	0.0	3.5	0.0	0.0	0.0	0.1	1.1	0.0	14.6	13.6
WVR-441	0.0	0.0	0.0	17.4	4.5	0.1	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	24.8	24.1
WVR-4410	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	5.4	5.1
WVR-4411	0.0	0.0	0.0	0.0	5.2	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	20.2	19.0
WVR-442	0.0	0.0	0.0	5.5	11.4	31.4	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.0	50.1	49.2
WVR-4420	0.0	0.0	0.0	5.1	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	17.1	17.0
WVR-4421	0.0	0.0	0.0	0.0	40.4	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	52.6	51.0

ULTIMATE CONDITION (2020)

Watershed ID	Land Use Category																		
	Row Crop Agriculture	Farmstead	Pits and Quarries	Low Density Residential	Medium Density Residential	High Density Residential	Neighborhood Services	Commercial	Industrial	Institutional	Mix	Park	Open Space	Golf Course	Right-of-Way	Water Modeled	Minnesota Zoological Gardens	**TOTALS**	TOTALS W/O WATER
	AG	FARM	PIT	LD	MD	HD	NS	COM	IND	INS	MIX	PARK	OPEN	GOLF	ROW	WAT	ZOO		
WVR-4422	0.0	0.0	0.0	3.7	6.6	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	11.5	11.4
WVR-4423	0.0	0.0	0.0	6.5	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	16.0	15.8
WVR-443	0.0	0.0	0.0	116.9	2.1	0.0	1.2	0.7	0.0	0.0	0.0	17.2	0.0	0.0	19.6	5.8	0.0	163.5	157.7
WVR-4430	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.1	16.7	0.0	0.0	1.0	0.0	0.0	26.7	26.7
WVR-4431	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	3.4	3.0
WVR-4432	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	1.3	1.0
WVR-45	0.0	0.0	0.0	7.3	0.1	31.8	0.0	157.6	0.0	0.5	0.0	0.0	0.0	0.0	9.6	4.2	0.0	211.2	207.0
WVR-46	0.0	0.0	0.0	2.6	25.0	0.0	0.0	5.6	0.0	15.9	0.0	0.0	0.0	0.0	5.7	1.8	0.0	56.7	54.9
WVR-47	0.0	0.0	0.0	36.7	45.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	14.3	0.0	0.1	0.7	0.0	97.4	96.7
WVR-48	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	14.1	13.5
WVR-49	0.0	0.0	0.0	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.5	0.3	0.0	30.2	30.0
WVR-5	0.0	0.0	0.0	32.3	0.0	5.7	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	1.2	8.9	0.0	51.7	42.8
WVR-50	0.0	0.0	0.0	65.9	2.5	16.8	0.0	3.6	0.0	0.3	0.0	4.7	0.2	0.0	18.8	4.4	0.0	117.3	112.9
WVR-52	0.0	0.0	0.0	30.5	10.0	0.0	0.0	0.0	0.0	0.0	72.1	20.9	0.0	0.0	2.6	0.0	0.0	136.0	136.0
WVR-53	0.0	0.0	0.0	0.1	14.2	0.0	0.0	0.0	0.4	3.9	99.6	15.7	0.0	0.0	7.6	0.0	0.0	141.5	141.5
WVR-54	0.0	0.0	0.0	6.7	25.2	0.0	0.0	0.0	0.0	0.0	73.3	0.0	0.0	0.0	1.1	0.0	0.0	106.3	106.3
WVR-55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	123.6	0.0	0.0	0.0	0.0	0.0	5.7	1.0	0.0	130.3	129.4
WVR-56	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	38.3	59.7	0.0	57.4	0.0	0.0	0.0	4.5	0.0	171.6	167.1
WVR-560	0.0	0.0	0.0	12.8	0.0	0.0	0.0	0.0	0.2	21.9	0.0	44.2	0.0	0.0	0.2	1.0	0.0	80.3	79.3
WVR-57	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	18.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.8	19.8
WVR-58	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.4	4.3	3.4
WVR-59	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	5.8	15.3	10.9
WVR-590	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	15.7	22.1	18.1
WVR-6	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.0	8.4	7.4
WVR-60	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	3.4	3.0
WVR-7	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	12.2	12.2
WVR-710	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	8.4	8.4
WVR-711	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	7.0	9.2	8.1
WVR-8	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	15.4	15.2
WVR-9	0.0	0.0	0.0	37.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	39.1	37.8
TOTALS	0.0	0.0	0.0	5669.1	699.2	238.7	66.1	668.6	312.8	493.2	249.4	490.3	536.4	215.3	643.6	453.3	451.7	11187.5	10734.3

Appendix B – Pond Data

Watershed ID	1990		2005		2020	
	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)
AL-1	0.00	0.00	0.50	0.59	0.50	0.59
AL-100	0.00	0.00	0.39	0.39	0.39	0.39
AL-11	0.48	0.55	0.48	0.55	0.48	0.55
AL-12	0.43	0.46	0.43	0.46	0.43	0.46
AL-13	0.42	0.44	0.42	0.44	0.42	0.44
AL-14	0.14	0.07	0.14	0.07	0.14	0.07
AL-2	0.00	0.00	0.98	1.80	0.98	1.80
AL-200	0.00	0.00	0.10	0.04	0.10	0.04
AL-201	0.00	0.00	0.08	0.03	0.08	0.03
AL-202	0.00	0.00	0.53	0.65	0.53	0.65
AL-3	0.29	0.24	0.29	0.24	0.29	0.24
AL-4	0.30	0.13	0.30	0.13	0.30	0.13
AL-5	0.89	1.74	0.89	1.74	0.89	1.74
AL-6	0.67	1.76	0.67	1.76	0.67	1.76
AL-7	0.53	0.54	0.53	0.54	0.53	0.54
AL-8	0.87	1.41	0.87	1.41	0.82	2.16
AL-9	44.00	0.00	44.00	0.00	44.00	0.00
BD-1	0.09	0.03	0.09	0.03	0.09	0.03
BD-10	1.27	2.78	1.27	2.78	1.27	2.78
BD-100	0.18	0.11	0.18	0.11	0.18	0.11
BD-101	0.00	0.00	0.00	0.00	0.00	0.00
BD-102	0.25	0.19	0.25	0.19	0.25	0.19
BD-103	0.19	0.12	0.19	0.12	0.19	0.12
BD-104	0.00	0.00	0.00	0.00	0.00	0.00
BD-11	0.84	2.77	0.84	2.77	0.84	2.77
BD-110	0.39	0.39	0.39	0.39	0.39	0.39
BD-12	0.49	0.57	0.49	0.57	0.49	0.57
BD-120	0.00	0.00	0.00	0.00	0.00	0.00
BD-13	0.96	1.74	0.96	1.74	0.96	1.74
BD-14	1.78	2.41	1.78	2.41	1.78	2.41
BD-140	0.88	1.52	0.88	1.52	0.88	1.52
BD-15	0.14	0.07	0.14	0.07	0.14	0.07
BD-150	0.05	0.01	0.05	0.01	0.05	0.01
BD-2	0.66	0.93	0.66	0.93	0.66	0.93
BD-3	0.00	0.00	0.00	0.00	0.00	0.00
BD-4	0.09	0.03	0.09	0.03	0.09	0.03
BD-5	0.15	0.08	0.15	0.08	0.15	0.08
BD-6	0.12	0.06	0.12	0.06	0.12	0.06
BD-61	0.25	0.18	0.25	0.18	0.25	0.18
BD-7	0.24	0.17	0.24	0.17	0.24	0.17
BD-70	0.00	0.00	0.00	0.00	0.00	0.00
BD-71	0.00	0.00	0.00	0.00	0.00	0.00
BD-8	0.41	0.43	0.41	0.43	0.41	0.43
BD-9	0.85	1.41	0.85	1.41	0.85	1.41
BD-90	0.83	1.37	0.83	1.37	0.83	1.37
EVR-1	0.87	1.48	0.87	1.48	0.87	1.48
EVR-10	0.46	0.52	0.46	0.52	0.46	0.52
EVR-11	0.29	0.24	0.29	0.24	0.29	0.24

Watershed ID	1990		2005		2020	
	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)
EVR-12	5.64	9.98	5.64	9.98	5.64	9.98
EVR-13	0.32	0.16	0.32	0.16	0.60	0.90
EVR-14	2.72	9.91	2.72	9.91	2.72	9.91
EVR-15	0.00	0.00	0.00	0.00	0.00	0.00
EVR-150	0.99	1.83	0.99	1.83	0.99	1.83
EVR-151	0.00	0.00	0.14	0.07	0.14	0.07
EVR-16	0.16	0.09	0.16	0.09	0.16	0.09
EVR-160	0.13	0.06	0.13	0.06	0.13	0.06
EVR-17	34.00	0.00	34.00	0.00	34.00	0.00
EVR-170	7.46	10.70	7.46	10.70	7.46	10.70
EVR-18	2.22	2.26	2.22	2.26	2.22	2.26
EVR-180	0.57	0.73	0.57	0.73	0.57	0.73
EVR-19	4.76	13.03	4.76	13.03	4.76	13.03
EVR-190	0.00	0.00	0.12	0.06	0.12	0.06
EVR-2	7.68	35.26	7.68	35.26	7.68	35.26
EVR-20	1.61	4.12	1.61	4.12	1.61	4.12
EVR-21	0.00	0.00	1.31	3.64	1.31	3.64
EVR-210	0.75	0.80	0.75	0.80	0.75	0.80
EVR-211	0.00	0.00	0.00	0.00	0.00	0.00
EVR-22	2.85	8.55	2.85	8.55	2.85	8.55
EVR-220	0.33	0.30	0.33	0.30	0.33	0.30
EVR-221	0.00	0.00	0.00	0.00	0.00	0.00
EVR-24	0.12	0.06	0.12	0.06	0.12	0.06
EVR-25	0.00	0.00	0.19	0.12	0.19	0.12
EVR-26	2.00	5.10	2.00	5.10	2.00	5.10
EVR-27	0.50	0.59	0.50	0.59	0.50	0.59
EVR-28	0.09	0.03	0.09	0.03	0.09	0.03
EVR-280	0.00	0.00	0.47	0.54	0.47	0.54
EVR-29	2.23	9.32	2.23	9.32	2.23	9.32
EVR-290	0.61	0.82	0.61	0.82	0.61	0.82
EVR-3	0.43	0.46	0.43	0.46	0.43	0.46
EVR-30	0.85	1.43	0.85	1.43	0.85	1.43
EVR-31	0.13	0.06	0.13	0.06	0.13	0.06
EVR-32	0.33	0.30	0.33	0.30	0.33	0.30
EVR-33	1.25	2.70	1.25	2.70	1.25	2.70
EVR-34	1.89	5.35	1.89	5.35	1.89	5.35
EVR-35	67.00	0.00	67.00	0.00	67.00	0.00
EVR-350	0.20	0.13	0.20	0.13	0.20	0.13
EVR-351	0.00	0.00	0.00	0.00	0.00	0.00
EVR-352	2.01	3.65	2.01	3.65	2.01	3.65
EVR-36	0.64	1.36	0.64	1.36	0.64	1.36
EVR-37	0.17	0.10	0.17	0.10	0.17	0.10
EVR-38	0.46	0.51	0.46	0.51	0.46	0.51
EVR-39	3.53	3.07	3.53	3.07	3.53	3.07
EVR-4	0.00	0.00	0.84	1.40	0.84	1.40
EVR-40	3.50	10.51	3.50	10.51	3.50	10.51
EVR-400	0.00	0.00	0.00	0.00	0.00	0.00
EVR-41	0.00	0.00	3.41	25.67	3.41	25.67

Watershed ID	1990		2005		2020	
	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)
EVR-42	0.00	0.00	0.00	0.00	0.00	0.00
EVR-43	0.52	0.63	0.52	0.63	0.52	0.63
EVR-430	0.00	0.00	0.00	0.00	0.00	0.00
EVR-44	0.00	0.00	33.60	0.00	33.60	0.00
EVR-440	0.00	0.00	0.00	0.00	0.00	0.00
EVR-45	1.42	3.33	1.42	3.33	1.42	3.33
EVR-46	1.50	3.63	1.50	3.63	1.50	3.63
EVR-47	1.92	5.49	1.92	5.49	1.92	5.49
EVR-48	0.00	0.00	2.97	3.69	2.97	3.69
EVR-49	0.00	0.00	0.00	0.00	0.00	0.00
EVR-5	0.48	0.55	0.48	0.55	0.48	0.55
EVR-50	2.43	8.08	2.43	8.08	2.43	8.08
EVR-51	0.00	0.00	0.40	0.41	0.40	0.41
EVR-52	0.80	1.30	0.80	1.30	0.80	1.30
EVR-53	1.94	5.59	1.94	5.59	1.94	5.59
EVR-54	0.17	0.09	0.17	0.09	0.17	0.09
EVR-55	3.59	17.15	3.59	17.15	3.59	17.15
EVR-550	0.36	0.34	0.36	0.34	0.36	0.34
EVR-551	0.00	0.00	0.00	0.00	0.00	0.00
EVR-552	0.11	0.05	0.11	0.05	0.11	0.05
EVR-553	0.41	0.42	0.41	0.42	0.41	0.42
EVR-56	0.00	0.00	0.00	0.00	0.00	0.00
EVR-6	0.58	0.76	0.58	0.76	0.58	0.76
EVR-7	0.94	1.04	0.94	1.04	0.94	1.04
EVR-8	0.25	0.19	0.25	0.19	0.25	0.19
exit 1	0.00	0.00	0.00	0.00	0.00	0.00
exit 2	0.00	0.00	0.00	0.00	0.00	0.00
exit 3a	0.00	0.00	0.00	0.00	0.00	0.00
exit 3b	0.00	0.00	0.00	0.00	0.00	0.00
exit 4	0.00	0.00	0.00	0.00	0.00	0.00
exit 5	0.00	0.00	0.00	0.00	0.00	0.00
exit 6	0.00	0.00	0.00	0.00	0.00	0.00
exit 7	0.00	0.00	0.00	0.00	0.00	0.00
KL-1	1.52	5.59	1.61	7.42	1.61	7.42
KL-20	0.00	0.00	0.00	0.00	0.00	0.00
KL-2	0.00	0.00	0.00	0.00	2.00	10.10
KL-3	2.47	8.33	2.47	8.33	2.47	8.33
KL-300	0.00	0.00	0.00	0.00	0.00	0.00
KL-4	1.51	4.37	1.51	4.37	1.51	4.37
LL-1	59.75	0.00	59.75	0.00	59.75	0.00
WVR-1	0.36	0.35	0.36	0.35	0.36	0.35
WVR-10	0.58	0.76	0.58	0.76	0.58	0.76
WVR-11	0.33	0.30	0.33	0.30	0.33	0.30
WVR-111	0.15	0.08	0.15	0.08	0.15	0.08
WVR-112	0.08	0.00	0.08	0.00	0.08	0.00
WVR-113	0.12	0.06	0.12	0.06	0.12	0.06
WVR-12	0.15	0.08	0.15	0.08	0.15	0.08
WVR-13	0.00	0.00	0.00	0.00	0.00	0.00

Watershed ID	1990		2005		2020	
	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)
WVR-130	0.08	0.03	0.08	0.03	0.08	0.03
WVR-14	0.92	1.63	0.92	1.63	0.92	1.63
WVR-15	0.37	0.36	0.37	0.36	0.37	0.36
WVR-16	0.09	0.04	0.09	0.04	0.09	0.04
WVR-17	3.98	11.94	3.98	11.94	3.98	11.94
WVR-170	0.11	0.05	0.11	0.05	0.11	0.05
WVR-171	0.27	0.21	0.27	0.21	0.27	0.21
WVR-172	0.00	0.00	0.00	0.00	0.00	0.00
WVR-18	0.53	0.65	0.53	0.65	0.53	0.65
WVR-19	0.18	0.11	0.18	0.11	0.18	0.11
WVR-190	0.10	0.04	0.10	0.04	0.10	0.04
WVR-191	0.03	0.01	0.03	0.01	0.03	0.01
WVR-2	0.59	0.78	0.59	0.78	0.59	0.78
WVR-20	0.00	0.00	0.00	0.00	0.00	0.00
WVR-201	0.07	0.02	0.07	0.02	0.07	0.02
WVR-202	0.04	0.01	0.04	0.01	0.04	0.01
WVR-21	0.20	0.13	0.20	0.13	0.20	0.13
WVR-22	1.27	2.77	1.27	2.77	1.27	2.77
WVR-23	0.12	0.05	0.12	0.05	0.12	0.05
WVR-230	0.00	0.00	0.00	0.00	0.00	0.00
WVR-231	1.12	2.24	1.12	2.24	1.12	2.24
WVR-24	0.00	0.00	0.00	0.00	0.00	0.00
WVR-25	0.00	0.00	0.00	0.00	0.00	0.00
WVR-26	1.03	1.96	1.03	1.96	1.50	9.77
WVR-27	1.66	5.17	1.66	5.17	1.66	5.17
WVR-28	0.00	0.00	6.75	22.84	6.75	22.84
WVR-280	0.00	0.00	6.51	23.77	6.51	23.77
WVR-281	0.00	0.00	0.14	0.07	0.14	0.07
WVR-29	1.15	2.35	1.15	2.35	1.15	2.35
WVR-290	0.00	0.00	0.00	0.00	0.00	0.00
WVR-291	0.00	0.00	0.00	0.00	0.00	0.00
WVR-292	0.10	0.04	0.10	0.04	0.10	0.04
WVR-3	0.13	0.06	0.13	0.06	0.13	0.06
WVR-30	1.00	1.87	1.00	1.87	1.00	1.87
WVR-31	0.00	0.00	0.00	0.00	0.64	0.89
WVR-32	0.00	0.00	0.00	0.00	0.00	0.00
WVR-320	0.00	0.00	0.52	2.13	0.52	2.13
WVR-321	0.00	0.00	3.00	18.57	3.00	18.57
WVR-322	0.00	0.00	0.13	0.06	0.13	0.06
WVR-33	0.96	1.74	0.96	1.74	0.96	1.74
WVR-34	0.08	0.00	0.08	0.00	0.08	0.00
WVR-35	0.00	0.00	0.00	0.00	0.00	0.00
WVR-36	2.77	10.05	2.77	10.05	2.77	10.05
WVR-37	0.00	0.00	0.00	0.00	0.00	0.00
WVR-370	0.00	0.00	0.00	0.00	0.00	0.00
WVR-38	0.31	0.27	0.31	0.27	0.31	0.27
WVR-4	0.00	0.00	0.00	0.00	0.00	0.00
WVR-40	3.67	12.82	3.67	12.82	3.67	12.82

Watershed ID	1990		2005		2020	
	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)	Basin Surface Area (ac)	Basin Volume (ac-ft)
WVR-41	0.94	2.03	0.94	2.03	0.94	2.03
WVR-42	0.70	1.03	0.70	1.03	0.70	1.03
WVR-4333	1.00	1.87	1.00	1.87	1.00	1.87
WVR-4334	0.00	0.00	0.44	0.48	0.44	0.48
WVR-4335	0.00	0.00	0.43	0.46	0.43	0.46
WVR-4336	0.00	0.00	0.36	0.34	0.36	0.34
WVR-4337	0.36	0.34	0.36	0.34	0.36	0.34
WVR-4338	0.00	0.00	0.00	0.00	0.00	0.00
WVR-44	0.00	0.00	1.08	3.45	1.08	3.45
WVR-440	0.00	0.00	1.05	4.22	1.05	4.22
WVR-441	0.00	0.00	0.68	1.41	0.68	1.41
WVR-4410	0.00	0.00	0.37	0.82	0.37	0.82
WVR-4411	0.00	0.00	1.24	8.46	1.24	8.46
WVR-442	0.00	0.00	0.97	4.69	0.97	4.69
WVR-4420	0.00	0.00	0.09	0.21	0.09	0.21
WVR-4421	0.00	0.00	1.61	5.67	1.61	5.67
WVR-4422	0.00	0.00	0.11	0.24	0.11	0.24
WVR-4423	0.00	0.00	0.19	0.59	0.19	0.59
WVR-443	0.00	0.00	5.75	20.48	5.75	20.48
WVR-4430	0.00	0.00	0.00	0.00	0.00	0.00
WVR-4431	0.00	0.00	0.44	0.47	0.44	0.47
WVR-4432	0.00	0.00	0.37	0.82	0.37	0.82
WVR-45	0.00	0.00	4.17	27.13	4.17	27.13
WVR-46	1.81	9.58	1.81	9.58	1.81	9.58
WVR-47	0.00	0.00	0.69	2.57	0.69	2.57
WVR-48	0.00	0.00	0.57	0.28	0.57	0.28
WVR-49	0.26	0.20	0.26	0.20	0.26	0.20
WVR-5	8.90	26.70	8.90	26.70	8.90	26.70
WVR-50	0.00	0.00	4.41	10.75	4.41	10.75
WVR-52	0.00	0.00	0.00	0.00	0.00	0.00
WVR-53	0.00	0.00	0.00	0.00	0.00	0.00
WVR-54	0.00	0.00	0.00	0.00	0.00	0.00
WVR-55	0.99	3.97	0.99	3.97	0.99	3.97
WVR-56	0.00	0.00	4.53	32.36	4.53	32.36
WVR-560	1.02	1.94	1.02	1.94	1.02	1.94
WVR-57	0.00	0.00	0.00	0.00	0.00	0.00
WVR-58	0.00	0.00	0.95	1.71	0.95	1.71
WVR-59	4.31	12.93	4.31	12.93	4.31	12.93
WVR-590	4.00	8.00	4.00	8.00	4.00	8.00
WVR-6	0.00	0.00	0.94	1.68	0.94	1.68
WVR-60	0.36	0.35	0.36	0.35	0.36	0.35
WVR-7	0.00	0.00	0.00	0.00	0.00	0.00
WVR-710	0.00	0.00	0.00	0.00	0.00	0.00
WVR-711	1.15	2.36	1.15	2.36	1.15	2.36
WVR-8	0.29	0.24	0.29	0.24	0.29	0.24
WVR-9	1.33	2.98	1.33	2.98	1.33	2.98

Appendix C – PONDNET Output by Drainage District

Apple Valley Loading Assessment
68-07360

Actual Values as Calculated by PondNET

Subwatershed	ID	1990 Condition			2005 Condition			2020 Condition			Comments
		TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)	
Project Area	Burnsville, Eagan, Lakeville, Rosemount	4,277	1,181,026	5,729	3,545	764,817	6,692	3,408	756,535	6,845	
Cobblestone Lake	EVR-44, EVR-LL	1,137	264,707	1,676	1,111	221,308	1,917	1,118	246,561	1,979	Monitored Outlet
Long Lake	EVR-17	267	47,779	493	311	56,657	576	279	50,853	576	
Lake Alimagnet	AL-9	149	41,999	200	158	39,322	238	138	36,689	238	
Farquar Lake	EVR-35	569	112,544	994	617	107,674	1,150	560	101,870	1,150	
Alimagnet and West Vermillion	WVR-443, exit 1, WVR-LL	2,236	600,056	2,939	1,516	224,447	3,636	1,555	245,955	3,728	
Lac Lavon	LL-1	67	21,709	56	67	21,790	56	59	21,769	56	
Keller	KL-20	413	111,001	462	407	108,461	463	250	53,440	462	2020 - Whitney pond included
Black Dog	BD-11, BD-14, BD-LL, exit 2, exit 3a	149	22,658	270	151	22,740	274	141	22,740	274	
Eagan	Eagan	262	158,006	294	274	161,865	305	267	161,865	305	
Rosemount	Rosemount	12	2,890	33	19	4,205	41	17	4,205	41	

Rounded Values using Significant Figures Criteria (2 for TP and Runoff, 3 for TSS)

Subwatershed	Subwatershed	1990 Condition			2005 Condition			2020 Condition			Comments
		TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)	TP Load (lbs/yr)	TSS Load (lbs/yr)	Water Volume (ac-ft/yr)	
Project Area	Burnsville, Eagan, Lakeville, Rosemount	4,300	1,180,000	5,700	3,500	765,000	6,700	3,400	757,000	6,800	
Cobblestone Lake	EVR-44	1,100	265,000	1,700	1,100	221,000	1,900	1,100	247,000	2,000	
Long Lake	EVR-17	270	47,800	490	310	56,700	580	280	50,900	580	
Lake Alimagnet	AL-9	150	42,000	200	160	39,300	240	140	36,700	240	
Farquar Lake	EVR-35	570	113,000	990	620	108,000	1,100	560	102,000	1,100	
Alimagnet and West Vermillion	WVR-443	2,200	600,000	2,900	1,500	224,000	3,600	1,600	246,000	3,700	
Lac Lavon	LL-1	67	21,700	56	67	21,800	56	59	21,800	56	
Keller	KL-20	410	111,000	460	410	108,000	460	250	53,400	460	
Black Dog	BD-11, BD-14, BD-LL, exit 2, exit 3a	150	22,700	270	150	22,700	270	140	22,700	270	
Eagan	Eagan	260	158,000	290	270	162,000	310	270	162,000	310	
Rosemount	Rosemount	12	2,890	33	19	4,200	41	17	4,200	41	

Loading color coding based on comparison to 1989 loads

increase
decrease or no change

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

Lake Alimagnet

		AL-1	AL-100	AL-2	AL-200	AL-201	AL-202	AL-3	AL-4	AL-5	AL-6	AL-7	AL-8	AL-9	AL-11	AL-12	AL-13	AL-14	BD-1	BD-10	BD-100	BD-101
Routed TO:		AL-2	AL-1	AL-8	AL-2	AL-2	AL-2	AL-8	AL-5	AL-6	AL-7	AL-8	AL-9	WVR-40	AL-13	AL-LL	AL-5	AL-LL	BD-102	BD-11	BD-102	BD-LL
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	3.8	11.1	56.7	1.9	4.2	10.2	11.6	13.0	40.9	22.4	2.6	42.6	194.3	21.0	9.5	7.9	7.4	30.6	32.1	3.0	1.6
Total watershed area (w/o wat	acres	3.8	11.1	56.7	1.9	4.2	10.2	11.3	12.7	40.0	21.7	2.1	41.7	150.2	20.5	9.0	7.5	7.2	30.5	30.9	2.8	1.6
basin area	acres	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.30	0.89	0.67	0.53	0.87	44.00	0.48	0.43	0.42	0.14	0.09	1.27	0.18	0.00
basin volume	acre-ft	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.13	1.74	1.76	0.54	1.41	0.00	0.55	0.46	0.44	0.07	0.03	2.78	0.11	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	3%	2%	0%	0%	0%	11%	95%	92%	95%	100%	44%	46%	60%	34%	18%	99%	100%	86%	100%	100%
Medium Density Residential		0%	0%	50%	0%	0%	0%	83%	0%	0%	0%	0%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	4%	0%	0%	0%	0%	0%	14%	0%	0%
Open Space		100%	97%	41%	85%	47%	72%	6%	0%	0%	0%	0%	17%	49%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	40%	66%	82%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	7%	15%	53%	28%	0%	3%	5%	5%	0%	10%	0%	1%	0%	1%	1%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	14.82	11.07	87.85	1.89	4.25	10.19	11.28	12.68	80.60	102.28	104.39	245.22	411.74	20.49	9.05	27.95	7.24	30.52	199.63	2.84	1.63
tributary water area	ac	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.30	2.08	2.76	3.29	4.44	49.01	0.48	0.43	0.89	0.14	0.09	2.26	0.18	0.00
direct and ponded area	ac	14.82	11.07	87.85	1.89	4.25	10.19	11.57	12.98	82.68	105.04	107.68	249.67	460.76	20.96	9.48	28.85	7.38	30.61	201.89	3.02	1.63
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	200.01	206.28	343.90	230.45	306.19	256.88	435.68	446.83	446.63	447.57	449.97	402.27	317.68	489.27	515.57	531.27	449.38	450.00	422.19	449.99	449.99
runoff ortho p/total p	-	0.60	0.59	0.42	0.55	0.44	0.51	0.32	0.30	0.31	0.30	0.30	0.35	0.45	0.46	0.56	0.63	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	1.73	1.87	6.83	2.92	5.88	3.95	9.74	7.69	7.44	7.55	7.45	7.59	4.45	5.80	4.69	4.03	7.47	7.45	6.86	7.45	7.45
unit export	lbs/ac-y	0.08	0.10	0.65	0.20	0.50	0.30	0.99	0.77	0.75	0.76	0.76	0.75	0.40	0.62	0.53	0.47	0.76	0.76	0.68	0.76	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	0.54	1.73	32.26	0.46	2.08	3.36	9.16	8.13	24.79	13.64	1.31	26.38	55.69	9.90	3.54	2.51	4.51	18.94	17.65	1.76	1.01
upstream pond	ac-ft/yr	1.73	0.00	8.17	0.00	0.00	0.00	0.00	0.00	20.53	45.32	58.97	109.86	144.29	0.00	0.00	9.90	0.00	0.00	102.07	0.00	0.00
total inflow	**ac-ft/yr**	**2.27**	**1.73**	**40.43**	**0.46**	**2.08**	**3.36**	**9.16**	**8.13**	**45.32**	**58.97**	**60.27**	**136.24**	**199.98**	**9.90**	**3.54**	**12.40**	**4.51**	**18.94**	**119.72**	**1.76**	**1.01**
outflow	ac-ft/yr	2.27	1.73	40.43	0.46	2.08	3.36	9.16	8.13	45.32	58.97	60.27	136.24	199.98	9.90	3.54	12.40	4.51	18.94	119.72	1.76	1.01
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	0.29	1.06	36.74	0.38	2.11	3.08	11.14	9.81	30.07	16.57	1.60	31.13	59.83	12.69	4.76	3.51	5.51	23.17	20.96	2.15	1.24
upstream pond	lbs/yr	1.06	0.00	6.91	0.00	0.00	0.00	0.00	0.00	15.70	25.62	26.23	74.49	88.97	0.00	0.00	7.78	0.00	0.00	96.18	0.00	0.00
total inflow	**lbs/yr**	**1.35**	**1.06**	**43.65**	**0.38**	**2.11**	**3.08**	**11.14**	**9.81**	**45.77**	**42.19**	**27.83**	**105.62**	**148.81**	**12.69**	**4.76**	**11.29**	**5.51**	**23.17**	**117.15**	**2.15**	**1.24**
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	3.98	2.64	20.15	15.96	4.15	23.49	0.00	4.91	1.84	2.76	1.59	2.38	46.02	0.80	0.00
outflow	lbs/yr	1.35	1.06	43.65	0.37	2.11	3.08	7.16	7.17	25.62	26.23	23.69	82.13	148.81	7.78	2.92	8.53	3.92	20.79	71.13	1.35	1.24
p removal efficiency	%	0.01	0.01	0.00	0.06	0.02	0.01	35.74	26.91	44.03	37.83	14.90	22.24	0.00	38.68	38.58	24.45	28.85	10.27	39.28	37.18	0.08
upstream w-shed p load	lbs/yr	1.35	1.06	43.65	0.38	2.11	3.08	11.14	9.81	56.08	72.65	74.25	160.17	230.27	12.69	4.76	16.20	5.51	23.17	144.74	2.15	1.24
total removal %	%	0.02	0.01	0.00	0.06	0.02	0.01	35.74	26.91	54.32	63.90	68.10	48.72	35.38	38.68	38.58	47.34	28.85	10.27	50.86	37.18	0.08
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.10	0.10	0.10	0.10	0.10	0.10	0.83	0.43	1.96	2.61	1.02	1.62	0.00	1.15	1.08	1.05	0.52	0.39	2.18	0.60	0.10
relative volume	inches	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.55	2.43	4.47	14.28	1.85	0.00	1.92	4.54	6.03	0.55	0.06	5.45	2.09	0.00
residence time	years	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.04	0.03	0.01	0.01	0.00	0.06	0.13	0.04	0.02	0.00	0.02	0.06	0.00
residence time	days	0.00	0.00	0.00	0.01	0.00	0.00	9.48	5.84	14.01	10.89	3.27	3.78	0.00	20.22	47.84	12.87	5.84	0.67	8.47	22.04	0.00
overflow rate	ft/yr	22706.83	17293.57	404301.14	4606.26	20826.44	33579.97	31.80	26.74	51.10	87.49	114.37	156.60	4.55	20.75	8.21	29.82	32.22	210.47	94.12	9.95	10122.35
inflow phos conc	ppb	219.00	224.96	397.21	299.55	372.41	337.36	447.48	444.12	371.54	263.24	169.88	285.23	273.77	471.64	495.24	334.83	449.23	450.02	360.01	450.02	450.02
outflow phos conc	ppb	218.98	224.93	397.20	299.36	372.33	337.32	287.56	324.59	207.95	163.66	144.57	221.80	273.77	289.20	304.16	252.97	319.64	403.80	218.59	282.71	449.65
p reaction rate	-	0.00	0.00	0.00	0.00	0.00	0.00	0.87	0.50	1.41	0.98	0.21	0.37	0.00	1.03	1.02	0.43	0.57	0.13	1.07	0.94	0.00
1-rp	-	1.00	1.00	1.00	1.00	1.00	1.00	0.64	0.73	0.56	0.62	0.85	0.78	1.00	0.61	0.61	0.76	0.71	0.90	0.61	0.63	1.00
vlawmo pond volume	acre-ft	0.04	0.12	2.33	0.03	0.15	0.24	0.66	0.59	1.79	0.99	0.09	1.90	4.02	0.71	0.26	0.18	0.33	1.37	1.27	0.13	0.07
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	200.01	206.28	343.90	230.45	306.19	256.88	435.68	446.83	446.63	447.57	449.97	402.27	317.68	489.27	515.57	531.27	449.38	450.00	422.19	449.99	449.99
runoff coefficient		0.05	0.05	0.20	0.08	0.17	0.11	0.28	0.22	0.22	0.22	0.22	0.22	0.13	0.17	0.14	0.12	0.22	0.22	0.20	0.22	0.22
dissolved/total P		0.60	0.59	0.42	0.55	0.44	0.51	0.32	0.30	0.31	0.30	0.30	0.35	0.45	0.46	0.56	0.63	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	216.00	214.09	171.16	204.43	175.65	194.39	144.35	140.00	142.12	140.00	140.00	153.06	180.84	170.09	189.91	202.03	140.00	140.00	150.57	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	316.85	976.75	12929.29	222.42	849.37	1490.70	3493.76	3084.26	9467.87	5175.45	496.65	10221.08	23698.31	4205.98	1672.76	1290.88	1711.32	7186.66	6936.92	668.22	384.04
upstream pond	lbs/yr	976.75	0.00	3856.09	0.00	0.00	0.00	0.00	0.00	2854.66	3696.76	3193.99	20716.23	18300.87	0.00	0.00	1472.09	0.00	0.00	23071.29	0.00	0.00
total inflow	**lbs/yr**	**1293.60**	**976.75**	**16785.38**	**222.42**	**849.37**	**1490.70**	**3493.76**	**3084.26**	**12322.53**	**8872.21**	**3690.64**	**30937.31**	**41999.19**	**4205.98**	**1672.76**	**2762.97**	**1711.32**	**7186.66**	**30008.21**	**668.22**	**384.04**
p removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	36.00	27.00	45.00	38.00	15.00	23.00	0.00	39.00	39.00	25.00	29.00	11.00	40.00	38.00	0.00
tss removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	62.00	53.04	70.00	64.00	29.46	45.18	0.00	65.00	65.00	49.11	55.88	21.61	66.00	64.00	0.00
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	2166.13	1635.76	8625.77	5678.21	1087.42	13977.04	0.00	2733.89	1087.29	1356.82	956.20	1552.83	19805.42	427.66	0.00
outflow	lbs/yr	1293.60	976.75	16785.38	222.42	849.37	1490.70	1327.63	1448.50	3696.76	3193.99	2603.22	16960.28	41999.19	1472.09	585.47	1406.16	755.12	5633.83	10202.79	240.56	384.04
tss removal efficiency (inf)		0.00	0.00	0.00	0.00	0.00	0.00	62.00	53.04	70.00	64.00	29.46	45.18	0.00	65.00	65.00	49.11	55.88	21.61	66.00	64.00	0.00
upstream watershed tss load	lbs/yr	1293.60	976.75	16785.38	222.42	849.37	1490.70	3493.76	3084.26	18048.99	23224.44	23721.09	54221.31	81303.71	4205.98	1672.76	5496.86	1711.32	7186.66	45997.73	668.22	384.04
tss total removal efficiency	%	0.00	0.00	0.00	0.00	0.00	0.00	62.00	53.04	79.52	86.25	89.03	68.72	48.34	65.00	65.00	74.42	55.88	21.61	77.82	64.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**2.27**	**1.73**	**40.43**	**0.46**	**2.08**	**3.36**	**9.16**	**8.13**	**45.32**	**58.97**	**60.27**	**136.24**	**199.98**	**9.90**	**3.54**	**12.40**	**4.51**	**18.94**	**119.72**	**1.76**	**1.01**
Adjusted TP outflow	**lbs/yr**	**1.35**	**1.06**	**43.65**	**0.37**	**2.11**	**3.08**	**7.16**	**7.17**	**25.62**	**26.23**	**23.69**	**82.13**	**148.81**	**7.78**	**2.92**	**8.53**	**3.92**	**20.79**	**71.13**	**1.35**	**1.24**
Adjusted TSS outflow	**lbs/yr**	**1293.60**	**976.75**	**16785.38**	**222.42**	**849.37**	**1490.70**	**1327.63**	**1448.50**	**3696.76**	**3193.99**	**2603.22**	**16960.28**	**41999.19**	**1472.09**	**585.47**	**1406.16**	**755.12**	**5633.83**	**10202.79**	**240.56**	**384.04**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		BD-102	BD-103	BD-104	BD-11	BD-110	BD-12	BD-120	BD-13	BD-14	BD-140	BD-15	BD-150	BD-2	BD-3	BD-4	BD-5	BD-6	BD-61	BD-7	BD-70	BD-71
Routed TO:		BD-10	BD-LL	BD-LL	Burnsville	BD-LL	BD-11	BD-LL	BD-LL	Burnsville	BD-14	BD-14	BD-LL	BD-LL	BD-102	BD-5	BD-7	BD-11	BD-6	BD-102	BD-7	BD-102
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	26.6	2.7	1.6	32.1	3.7	3.1	2.0	9.4	43.8	18.8	47.5	6.8	21.3	5.6	6.1	25.2	4.6	12.2	63.1	6.2	3.4
Total watershed area (w/o wat	acres	26.4	2.6	1.6	31.2	3.3	2.6	2.0	8.4	42.0	17.9	47.3	6.8	20.6	5.6	6.0	25.0	4.5	12.0	62.9	6.2	3.4
basin area	acres	0.25	0.19	0.00	0.84	0.39	0.49	0.00	0.96	1.78	0.88	0.14	0.05	0.66	0.00	0.09	0.15	0.12	0.25	0.24	0.00	0.00
basin volume	acre-ft	0.19	0.12	0.00	2.77	0.39	0.57	0.00	1.74	2.41	1.52	0.07	0.01	0.93	0.00	0.03	0.08	0.06	0.18	0.17	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		99%	100%	44%	87%	32%	100%	34%	100%	88%	78%	96%	50%	80%	100%	100%	100%	100%	100%	94%	42%	100%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	5%	0%	0%	0%	0%	8%	8%	1%	0%	0%	0%	0%	0%	0%	0%	2%	58%	0%
Open Space		1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	4%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	56%	6%	68%	0%	66%	0%	4%	14%	3%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	168.76	2.56	1.58	273.46	3.29	2.57	1.98	8.45	107.23	17.91	47.33	6.80	20.64	5.55	6.03	31.05	16.48	11.98	100.13	6.17	3.36
tributary water area	ac	0.99	0.19	0.00	6.04	0.39	0.49	0.00	0.96	2.81	0.88	0.14	0.05	0.66	0.00	0.09	0.23	0.37	0.25	0.47	0.00	0.00
direct and ponded area	ac	169.75	2.74	1.58	279.50	3.68	3.06	1.98	9.41	110.04	18.79	47.47	6.85	21.30	5.55	6.11	31.28	16.85	12.23	100.60	6.17	3.36
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	448.69	449.99	421.81	431.85	416.22	449.99	416.83	450.00	432.52	427.51	445.84	424.86	432.15	450.00	450.00	450.00	450.00	450.00	436.28	333.52	450.00
runoff ortho p/total p	-	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.32	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30
unit runoff	in/yr	7.42	7.45	8.63	7.25	8.87	7.45	8.84	7.45	7.20	7.41	7.45	8.50	7.45	7.45	7.45	7.45	7.45	7.45	7.19	5.00	7.45
unit export	lbs/ac-y	0.76	0.76	0.82	0.72	0.83	0.76	0.83	0.76	0.72	0.73	0.75	0.81	0.75	0.76	0.76	0.76	0.76	0.76	0.72	0.42	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	16.29	1.59	1.13	18.86	2.43	1.59	1.46	5.24	25.21	11.05	29.39	4.82	12.81	3.44	3.74	15.53	2.79	7.44	37.70	2.57	2.09
upstream pond	ac-ft/yr	85.77	0.00	0.00	145.02	0.00	0.00	0.00	0.00	40.44	0.00	0.00	0.00	0.00	0.00	0.00	3.74	7.44	0.00	21.84	0.00	0.00
total inflow	**ac-ft/yr**	**102.07**	**1.59**	**1.13**	**163.88**	**2.43**	**1.59**	**1.46**	**5.24**	**65.65**	**11.05**	**29.39**	**4.82**	**12.81**	**3.44**	**3.74**	**19.27**	**10.23**	**7.44**	**59.54**	**2.57**	**2.09**
outflow	ac-ft/yr	102.07	1.59	1.13	163.88	2.43	1.59	1.46	5.24	65.65	11.05	29.39	4.82	12.81	3.44	3.74	19.27	10.23	7.44	59.54	2.57	2.09
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	19.92	1.94	1.29	22.56	2.73	1.95	1.64	6.41	30.18	13.05	35.71	5.52	15.53	4.21	4.57	19.00	3.42	9.10	45.59	2.62	2.55
upstream pond	lbs/yr	86.72	0.00	0.00	86.77	0.00	0.00	0.00	0.00	37.09	0.00	0.00	0.00	0.00	0.00	0.00	3.57	5.88	0.00	21.39	0.00	0.00
total inflow	**lbs/yr**	**106.63**	**1.94**	**1.29**	**109.34**	**2.73**	**1.95**	**1.64**	**6.41**	**67.27**	**13.05**	**35.71**	**5.52**	**15.53**	**4.21**	**4.57**	**22.56**	**9.29**	**9.10**	**66.98**	**2.62**	**2.55**
net sedimentation	lbs/yr	10.45	0.74	0.00	33.07	1.25	0.99	0.00	3.66	27.60	6.99	4.67	0.64	7.41	0.00	1.01	3.79	1.48	3.22	9.16	0.00	0.00
outflow	lbs/yr	96.18	1.20	1.29	76.27	1.48	0.96	1.64	2.75	39.67	6.06	31.03	4.89	8.12	4.21	3.57	18.77	7.81	5.88	57.81	2.62	2.55
p removal efficiency	%	9.80	38.19	0.07	30.25	45.82	50.78	0.05	57.13	41.03	53.58	13.08	11.56	47.73	0.02	21.99	16.79	15.94	35.39	13.68	0.03	0.04
upstream w-shed p load	lbs/yr	123.78	1.94	1.29	197.30	2.73	1.95	1.64	6.41	78.93	13.05	35.71	5.52	15.53	4.21	4.57	23.57	12.51	9.10	71.77	2.62	2.55
total removal %	%	22.29	38.19	0.07	61.35	45.82	50.78	0.05	57.13	49.74	53.58	13.08	11.56	47.73	0.02	21.99	20.34	37.57	35.39	19.45	0.03	0.04
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.76	0.62	0.10	3.30	1.01	1.17	0.10	1.82	1.35	1.72	0.52	0.26	1.42	0.10	0.37	0.53	0.47	0.75	0.73	0.10	0.10
relative volume	inches	0.41	2.52	0.00	5.08	5.60	12.45	0.00	11.52	3.30	4.77	0.09	0.09	2.52	0.00	0.30	0.17	0.69	0.85	0.16	0.00	0.00
residence time	years	0.00	0.07	0.00	0.02	0.16	0.36	0.00	0.33	0.04	0.14	0.00	0.00	0.07	0.00	0.01	0.00	0.01	0.02	0.00	0.00	0.00
residence time	days	0.68	26.54	0.00	6.17	59.09	131.23	0.00	121.45	13.38	50.25	0.92	1.00	26.60	0.00	3.14	1.46	2.00	9.00	1.06	0.00	0.00
overflow rate	ft/yr	405.03	8.53	11343.98	195.09	6.22	3.25	14551.07	5.46	36.80	12.50	206.98	96.36	19.47	34442.23	43.48	131.98	85.23	30.23	251.22	25708.31	20851.89
inflow phos conc	ppb	384.38	450.02	418.84	245.47	413.65	450.02	414.20	450.02	376.98	434.34	446.97	421.79	445.87	450.02	450.02	430.82	334.24	450.02	413.87	374.44	450.02
outflow phos conc	ppb	346.71	278.17	418.55	171.22	224.13	221.50	413.98	192.92	222.30	201.63	388.50	373.04	233.07	449.91	351.07	358.47	280.97	290.77	357.24	374.33	449.84
p reaction rate	-	0.12	1.00	0.00	0.62	1.56	2.10	0.00	3.11	1.18	2.49	0.17	0.15	1.75	0.00	0.36	0.24	0.23	0.85	0.18	0.00	0.00
1-rp	-	0.90	0.62	1.00	0.70	0.54	0.49	1.00	0.43	0.59	0.46	0.87	0.88	0.52	1.00	0.78	0.83	0.84	0.65	0.86	1.00	1.00
vlawmo pond volume	acre-ft	1.18	0.11	0.08	1.36	0.18	0.12	0.11	0.38	1.82	0.80	2.12	0.35	0.93	0.25	0.27	1.12	0.20	0.54	2.72	0.19	0.15
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	448.69	449.99	421.81	431.85	416.22	449.99	416.83	450.00	432.52	427.51	445.84	424.86	432.15	450.00	450.00	450.00	450.00	450.00	436.28	333.52	450.00
runoff coefficient		0.21	0.22	0.25	0.21	0.26	0.22	0.26	0.22	0.21	0.21	0.22	0.25	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.14	0.22
dissolved/total P		0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.32	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30
runoff TSS conc	ppm	140.40	140.00	140.00	145.40	140.00	140.00	140.00	140.00	145.89	145.94	141.02	140.00	145.43	140.00	140.00	140.00	140.00	140.00	144.20	184.26	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	6186.33	602.30	430.39	7265.06	920.89	604.89	552.07	1988.35	9746.47	4270.45	11186.15	1827.96	4904.56	1306.74	1418.58	5891.97	1059.29	2821.10	14435.70	1175.48	791.12
upstream pond	lbs/yr	22524.60	0.00	0.00	12706.63	0.00	0.00	0.00	0.00	8537.00	0.00	0.00	0.00	0.00	0.00	0.00	805.55	1072.02	0.00	5636.50	0.00	0.00
total inflow	**lbs/yr**	**28710.93**	**602.30**	**430.39**	**19971.68**	**920.89**	**604.89**	**552.07**	**1988.35**	**18283.47**	**4270.45**	**11186.15**	**1827.96**	**4904.56**	**1306.74**	**1418.58**	**6697.52**	**2131.31**	**2821.10**	**20072.20**	**1175.48**	**791.12**
p removal efficiency (no inf)	%	10.00	39.00	0.00	31.00	46.00	51.00	0.00	58.00	42.00	54.00	14.00	12.00	48.00	0.00	22.00	17.00	16.00	36.00	14.00	0.00	0.00
tss removal efficiency (no inf)	%	19.64	65.00	0.00	57.63	72.00	83.00	0.00	93.00	68.00	90.00	27.50	23.57	76.00	0.00	43.21	33.39	31.43	62.00	27.50	0.00	0.00
net sedimentation	lbs/yr	5639.65	391.49	0.00	11508.68	663.04	502.06	0.00	1849.16	12432.76	3843.40	3076.19	430.88	3727.47	0.00	613.03	2236.49	669.84	1749.08	5519.86	0.00	0.00
outflow	lbs/yr	23071.29	210.80	430.39	8463.00	257.85	102.83	552.07	139.18	5850.71	427.04	8109.96	1397.09	1177.10	1306.74	805.55	4461.03	1461.47	1072.02	14552.35	1175.48	791.12
tss removal efficiency (inf)		19.64	65.00	0.00	57.63	72.00	83.00	0.00	93.00	68.00	90.00	27.50	23.57	76.00	0.00	43.21	33.39	31.43	62.00	27.50	0.00	0.00
upstream watershed tss load	lbs/yr	39060.81	602.30	430.39	62984.40	920.89	604.89	552.07	1988.35	25203.06	4270.45	11186.15	1827.96	4904.56	1306.74	1418.58	7310.55	3880.39	2821.10	22921.72	1175.48	791.12
tss total removal efficiency	%	40.93	65.00	0.00	86.56	72.00	83.00	0.00	93.00	76.79	90.00	27.50	23.57	76.00	0.00	43.21	38.98	62.34	62.00	36.51	0.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**102.07**	**1.59**	**1.13**	**163.88**	**2.43**	**1.59**	**1.46**	**5.24**	**65.65**	**11.05**	**29.39**	**4.82**	**12.81**	**3.44**	**3.74**	**19.27**	**10.23**	**7.44**	**59.54**	**2.57**	**2.09**
Adjusted TP outflow	**lbs/yr**	**96.18**	**1.20**	**1.29**	**76.27**	**1.48**	**0.96**	**1.64**	**2.75**	**39.67**	**6.06**	**31.03**	**4.89**	**8.12**	**4.21**	**3.57**	**18.77**	**7.81**	**5.88**	**57.81**	**2.62**	**2.55**
Adjusted TSS outflow	**lbs/yr**	**23071.29**	**210.80**	**430.39**	**8463.00**	**257.85**	**102.83**	**552.07**	**139.18**	**5850.71**	**427.04**	**8109.96**	**1397.09**	**1177.10**	**1306.74**	**805.55**	**4461.03**	**1461.47**	**1072.02**	**14552.35**	**1175.48**	**791.12**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		BD-8	BD-9	BD-90	EVR-1	EVR-2	EVR-3	EVR-4	EVR-5	EVR-6	EVR-7	EVR-8	EVR-10	EVR-11	EVR-12	EVR-13	EVR-14	EVR-15	EVR-150	EVR-151	EVR-16	EVR-160
Routed TO:		BD-11	BD-11	BD-9	EVR-13	EVR-7	EVR-LL	EVR-7	EVR-7	EVR-7	EVR-8	EVR-11	EVR-170	EVR-12	EVR-17	EVR-17	EVR-17	EVR-LL	EVR-15	EVR-170	EVR-LL	EVR-LL
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	8.5	8.1	9.0	19.1	84.2	15.8	84.2	79.3	16.6	79.9	28.7	74.1	15.8	61.0	84.3	25.8	12.1	7.8	23.5	7.1	6.8
Total watershed area (w/o wat	acres	8.1	7.3	8.2	18.2	76.5	15.4	84.2	78.8	16.0	79.0	28.4	73.6	15.5	55.4	83.9	23.0	12.1	6.8	23.5	6.9	6.7
basin area	acres	0.41	0.85	0.83	0.87	7.68	0.43	0.00	0.48	0.58	0.94	0.25	0.46	0.29	5.64	0.32	2.72	0.00	0.99	0.00	0.16	0.13
basin volume	acre-ft	0.43	1.41	1.37	1.48	35.26	0.46	0.00	0.55	0.76	1.04	0.19	0.52	0.24	9.98	0.16	9.91	0.00	1.83	0.00	0.09	0.06
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	53%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	4%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	75%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		66%	96%	26%	39%	97%	25%	2%	95%	24%	92%	87%	89%	96%	89%	52%	86%	35%	46%	3%	100%	83%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	38%	3%	0%	0%	0%	0%	3%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	1%	75%	0%	4%	65%	4%	0%	0%	0%	10%	13%	1%	0%	0%	0%	0%	0%
Open Space		34%	0%	18%	3%	0%	0%	0%	0%	10%	0%	13%	0%	4%	1%	25%	13%	57%	54%	39%	0%	14%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	4%	57%	21%	0%	0%	9%	0%	0%	0%	0%	11%	0%	0%	1%	0%	0%	0%	1%	0%	3%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	8.13	15.44	8.16	18.23	76.49	15.39	84.22	78.79	16.03	334.50	362.92	73.60	378.43	433.79	233.88	23.05	18.92	6.79	23.48	6.93	6.69
tributary water area	ac	0.41	1.68	0.83	0.87	7.68	0.43	0.00	0.48	0.58	9.68	9.94	0.46	10.23	15.87	10.12	2.72	0.99	0.99	0.00	0.16	0.13
direct and ponded area	ac	8.54	17.11	8.99	19.10	84.17	15.82	84.22	79.27	16.61	344.19	372.85	74.06	388.66	449.66	244.00	25.77	19.91	7.78	23.48	7.09	6.82
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	365.24	448.16	377.18	394.89	446.17	300.88	118.76	440.37	293.52	433.17	418.14	443.52	440.15	428.43	351.38	414.93	315.71	315.99	396.88	450.00	414.59
runoff ortho p/total p	-	0.40	0.30	0.35	0.31	0.30	0.30	0.06	0.30	0.33	0.30	0.34	0.30	0.31	0.30	0.39	0.34	0.46	0.46	0.37	0.30	0.34
unit runoff	in/yr	5.51	7.52	7.62	9.32	7.53	4.31	1.70	7.25	4.11	7.29	6.72	7.64	7.22	6.99	5.21	6.65	4.00	4.38	3.72	7.45	6.74
unit export	lbs/ac-y	0.53	0.76	0.70	0.82	0.76	0.33	0.18	0.73	0.31	0.73	0.67	0.77	0.73	0.70	0.48	0.66	0.36	0.39	0.39	0.76	0.67
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	3.73	4.56	5.18	14.16	47.99	5.53	11.95	47.59	5.49	48.00	15.91	46.88	9.33	32.26	36.42	12.77	4.04	2.48	7.27	4.30	3.75
upstream pond	ac-ft/yr	0.00	5.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	113.02	161.02	0.00	176.93	186.26	88.57	0.00	2.48	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**3.73**	**9.74**	**5.18**	**14.16**	**47.99**	**5.53**	**11.95**	**47.59**	**5.49**	**161.02**	**176.93**	**46.88**	**186.26**	**218.52**	**124.99**	**12.77**	**6.52**	**2.48**	**7.27**	**4.30**	**3.75**
outflow	ac-ft/yr	3.73	9.74	5.18	14.16	47.99	5.53	11.95	47.59	5.49	161.02	176.93	46.88	186.26	218.52	124.99	12.77	6.52	2.48	7.27	4.30	3.75
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	4.29	5.55	5.70	15.04	58.11	5.08	14.78	57.70	5.01	57.65	19.10	56.44	11.36	38.61	40.01	15.29	4.37	2.67	9.14	5.26	4.48
upstream pond	lbs/yr	0.00	2.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.62	106.87	0.00	120.83	125.34	31.80	0.00	1.35	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**4.29**	**8.34**	**5.70**	**15.04**	**58.11**	**5.08**	**14.78**	**57.70**	**5.01**	**132.27**	**125.97**	**56.44**	**132.19**	**163.95**	**71.81**	**15.29**	**5.72**	**2.67**	**9.14**	**5.26**	**4.48**
net sedimentation	lbs/yr	1.75	4.01	2.90	7.54	40.56	2.10	0.01	18.22	2.20	25.41	5.14	17.35	6.85	65.27	2.36	10.00	0.00	1.32	0.00	1.66	1.18
outflow	lbs/yr	2.54	4.33	2.79	7.49	17.55	2.99	14.78	39.48	2.81	106.87	120.83	39.09	125.34	98.67	69.46	5.28	5.72	1.35	9.14	3.61	3.30
p removal efficiency	%	40.82	48.08	50.99	50.16	69.80	41.24	0.03	31.58	43.95	19.21	4.08	30.74	5.18	39.81	3.28	65.44	0.01	49.48	0.01	31.47	26.45
upstream w-shed p load	lbs/yr	4.29	11.24	5.70	15.04	58.11	5.08	14.78	57.70	5.01	193.26	212.36	56.44	223.72	262.33	139.91	15.29	7.04	2.67	9.14	5.26	4.48
total removal %	%	40.82	61.49	50.99	50.16	69.80	41.24	0.03	31.58	43.95	44.70	43.10	30.74	43.98	62.39	50.36	65.44	18.79	49.48	0.01	31.47	26.45
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.04	1.67	1.65	1.70	4.59	1.07	0.10	1.15	1.31	1.11	0.76	1.13	0.84	1.77	0.51	3.64	0.10	1.85	0.10	0.56	0.49
relative volume	inches	3.96	10.74	9.16	3.62	25.44	2.87	0.00	0.40	4.78	0.75	0.42	0.38	0.91	10.71	0.15	26.87	0.00	25.63	0.00	0.72	0.59
residence time	years	0.11	0.15	0.26	0.10	0.73	0.08	0.00	0.01	0.14	0.01	0.00	0.01	0.00	0.05	0.00	0.78	0.00	0.74	0.00	0.02	0.02
residence time	days	41.76	53.01	96.58	38.20	268.16	30.23	0.00	4.25	50.37	2.36	0.40	4.05	0.48	16.67	0.47	283.24	0.00	270.25	0.00	7.64	6.20
overflow rate	ft/yr	9.10	11.51	6.24	16.27	6.25	12.93	119545.98	99.15	9.47	171.30	699.32	101.91	635.71	38.74	395.55	4.69	65223.56	2.50	72699.03	26.88	28.88
inflow phos conc	ppb	423.39	315.04	404.47	390.70	445.50	337.87	455.00	446.09	336.03	302.23	261.95	443.01	261.11	276.03	211.39	440.39	322.73	397.09	462.71	450.02	439.11
outflow phos conc	ppb	250.57	163.57	198.25	194.74	134.54	198.55	454.85	305.24	188.34	244.18	251.27	306.81	247.57	166.13	204.45	152.21	322.71	200.60	462.66	308.41	322.98
p reaction rate	-	1.17	1.78	2.12	2.02	7.65	1.19	0.00	0.67	1.40	0.29	0.04	0.64	0.06	1.10	0.04	5.48	0.00	1.94	0.00	0.67	0.49
1-rp	-	0.59	0.52	0.49	0.50	0.30	0.59	1.00	0.68	0.56	0.81	0.96	0.69	0.95	0.60	0.97	0.35	1.00	0.51	1.00	0.69	0.74
vlawmo pond volume	acre-ft	0.27	0.33	0.37	1.02	3.47	0.40	0.86	3.44	0.40	3.47	1.15	3.39	0.67	2.33	2.63	0.92	0.29	0.18	0.52	0.31	0.27
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	365.24	448.16	377.18	394.89	446.17	300.88	118.76	440.37	293.52	433.17	418.14	443.52	440.15	428.43	351.38	414.93	315.71	315.99	396.88	450.00	414.59
runoff coefficient		0.16	0.22	0.22	0.27	0.22	0.12	0.05	0.21	0.12	0.21	0.19	0.22	0.21	0.20	0.15	0.19	0.12	0.13	0.11	0.22	0.19
dissolved/total P		0.40	0.30	0.35	0.31	0.30	0.30	0.06	0.30	0.33	0.30	0.34	0.30	0.31	0.30	0.39	0.34	0.46	0.46	0.37	0.30	0.34
runoff TSS conc	ppm	165.77	140.00	153.55	142.06	140.47	196.67	38.45	143.07	197.50	141.34	149.68	140.41	142.99	148.05	174.94	150.83	184.89	180.74	184.53	140.00	150.29
POND TSS BUDGETS.....																						
runoff	lbs/yr	1497.22	1730.38	2008.73	5386.66	18233.04	2738.12	4841.10	18248.60	2715.37	18392.51	6143.33	17803.06	3559.71	12554.32	15438.99	4949.20	1763.02	1048.31	3392.35	1631.89	1451.19
upstream pond	lbs/yr	0.00	341.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14523.30	19984.59	0.00	23561.79	23925.04	2146.36	0.00	199.18	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**1497.22**	**2071.86**	**2008.73**	**5386.66**	**18233.04**	**2738.12**	**4841.10**	**18248.60**	**2715.37**	**32915.80**	**26127.93**	**17803.06**	**27121.50**	**36479.36**	**17585.35**	**4949.20**	**1962.20**	**1048.31**	**3392.35**	**1631.89**	**1451.19**
p removal efficiency (no inf)	%	41.00	49.00	51.00	51.00	70.00	42.00	0.00	32.00	44.00	20.00	5.00	31.00	6.00	40.00	4.00	66.00	0.00	50.00	0.00	32.00	27.00
tss removal efficiency (no inf)	%	67.00	78.50	83.00	83.00	93.00	68.00	0.00	58.50	69.33	39.29	9.82	57.63	11.79	66.00	7.86	93.00	0.00	81.00	0.00	58.50	53.04
net sedimentation	lbs/yr	1003.14	1626.41	1667.24	4470.93	16956.73	1861.92	0.00	10675.43	1882.66	12931.21	2566.14	10259.01	3196.46	24076.38	1381.71	4602.76	0.00	849.13	0.00	954.65	769.65
outflow	lbs/yr	494.08	445.45	341.48	915.73	1276.31	876.20	4841.10	7573.17	832.71	19984.59	23561.79	7544.05	23925.04	12402.98	16203.65	346.44	1962.20	199.18	3392.35	677.23	681.54
tss removal efficiency (inf)		67.00	78.50	83.00	83.00	93.00	68.00	0.00	58.50	69.33	39.29	9.82	57.63	11.79	66.00	7.86	93.00	0.00	81.00	0.00	58.50	53.04
upstream watershed tss load	lbs/yr	1497.22	3739.11	2008.73	5386.66	18233.04	2738.12	4841.10	18248.60	2715.37	62430.62	68573.95	17803.06	72133.66	84687.99	50227.29	4949.20	2811.33	1048.31	3392.35	1631.89	1451.19
tss total removal efficiency	%	67.00	88.09	83.00	83.00	93.00	68.00	0.00	58.50	69.33	67.99	65.64	57.63	66.83	85.35	67.74	93.00	30.20	81.00	0.00	58.50	53.04
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**3.73**	**9.74**	**5.18**	**14.16**	**47.99**	**5.53**	**11.95**	**47.59**	**5.49**	**161.02**	**176.93**	**46.88**	**186.26**	**218.52**	**124.99**	**12.77**	**6.52**	**2.48**	**7.27**	**4.30**	**3.75**
Adjusted TP outflow	**lbs/yr**	**2.54**	**4.33**	**2.79**	**7.49**	**17.55**	**2.99**	**14.78**	**39.48**	**2.81**	**106.87**	**120.83**	**39.09**	**125.34**	**98.67**	**69.46**	**5.28**	**5.72**	**1.35**	**9.14**	**3.61**	**3.30**
Adjusted TSS outflow	**lbs/yr**	**494.08**	**445.45**	**341.48**	**915.73**	**1276.31**	**876.20**	**4841.10**	**7573.17**	**832.71**	**19984.59**	**23561.79**	**7544.05**	**23925.04**	**12402.98**	**16203.65**	**346.44**	**1962.20**	**199.18**	**3392.35**	**677.23**	**681.54**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS Long Lake

		EVR-17	EVR-170	EVR-18	EVR-180	EVR-19	EVR-190	EVR-20	EVR-21	EVR-210	EVR-211	EVR-22	EVR-220	EVR-221	EVR-24	EVR-25	EVR-26	EVR-27	EVR-28	EVR-280	EVR-29	EVR-290
Routed TO:		EVR-35	EVR-17	EVR-210	EVR-18	EVR-210	EVR-19	EVR-210	EVR-35	EVR-21	EVR-210	EVR-350	EVR-22	EVR-220	EVR-26	EVR-26	EVR-29	EVR-29	EVR-LL	EVR-LL	EVR-352	EVR-352
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	83.4	95.7	66.3	13.1	169.6	46.5	29.3	63.9	57.8	6.0	36.4	3.6	7.0	11.9	14.3	78.3	90.7	5.7	6.2	113.0	9.5
Total watershed area (w/o wat	acres	49.4	88.2	64.1	12.5	164.8	46.5	27.7	63.9	57.1	6.0	33.5	3.3	7.0	11.8	14.3	76.3	90.2	5.7	6.2	110.8	8.9
basin area	acres	34.00	7.46	2.22	0.57	4.76	0.00	1.61	0.00	0.75	0.00	2.85	0.33	0.00	0.12	0.00	2.00	0.50	0.09	0.00	2.23	0.61
basin volume	acre-ft	0.00	10.70	2.26	0.73	13.03	0.00	4.12	0.00	0.80	0.00	8.55	0.30	0.00	0.06	0.00	5.10	0.59	0.03	0.00	9.32	0.82
Row Crop Agriculture		0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%
Farmstead		1%	0%	1%	0%	5%	0%	0%	7%	2%	0%	0%	0%	0%	0%	0%	0%	0%	40%	82%	2%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		87%	67%	72%	6%	26%	0%	100%	14%	86%	0%	99%	72%	0%	100%	2%	57%	86%	54%	2%	47%	100%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	17%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	1%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	85%	32%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	4%	0%	0%	0%	0%
Open Space		0%	6%	25%	67%	43%	100%	0%	52%	6%	100%	0%	0%	0%	0%	12%	6%	8%	0%	0%	29%	0%
Golf Course		0%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	84%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		1%	20%	0%	0%	7%	0%	0%	11%	0%	0%	1%	28%	16%	0%	1%	2%	1%	6%	15%	10%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	925.47	185.30	76.62	12.55	211.35	46.50	27.70	442.60	378.71	5.99	44.62	10.31	6.99	11.77	14.31	102.42	90.19	5.66	6.16	303.40	8.89
tributary water area	ac	70.63	7.92	2.79	0.57	4.76	0.00	1.61	9.91	9.91	0.00	3.18	0.33	0.00	0.12	0.00	2.12	0.50	0.09	0.00	4.85	0.61
direct and ponded area	ac	996.10	193.22	79.41	13.12	216.11	46.50	29.31	452.51	388.63	5.99	47.80	10.64	6.99	11.89	14.31	104.54	90.69	5.75	6.16	308.25	9.50
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	425.62	423.41	384.89	254.92	352.66	200.00	449.58	307.52	432.85	200.05	449.62	436.12	525.65	450.00	333.82	395.22	420.43	406.82	359.85	381.08	450.00
runoff ortho p/total p	-	0.30	0.31	0.38	0.50	0.51	0.60	0.30	0.47	0.32	0.60	0.30	0.30	0.64	0.30	0.34	0.32	0.33	0.38	0.46	0.38	0.30
unit runoff	in/yr	6.95	7.33	6.01	4.70	4.20	1.73	7.44	5.64	7.45	1.73	7.46	8.03	4.27	7.45	10.31	8.33	6.82	5.90	4.31	5.61	7.45
unit export	lbs/ac-y	0.69	0.72	0.58	0.34	0.39	0.08	0.76	0.51	0.75	0.08	0.76	0.79	0.48	0.76	0.81	0.75	0.68	0.57	0.36	0.54	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	28.65	53.87	32.11	4.92	57.67	6.71	17.17	30.05	35.43	0.87	20.85	2.22	2.48	7.30	12.30	53.02	51.29	2.78	2.21	51.79	5.52
upstream pond	ac-ft/yr	464.30	54.15	4.92	0.00	6.71	0.00	0.00	154.86	119.43	0.00	5.20	2.48	0.00	0.00	0.00	19.60	0.00	0.00	0.00	123.92	0.00
total inflow	**ac-ft/yr**	**492.95**	**108.02**	**37.02**	**4.92**	**64.37**	**6.71**	**17.17**	**184.90**	**154.86**	**0.87**	**26.04**	**4.71**	**2.48**	**7.30**	**12.30**	**72.62**	**51.29**	**2.78**	**2.21**	**175.70**	**5.52**
outflow	ac-ft/yr	492.95	108.02	37.02	4.92	64.37	6.71	17.17	184.90	154.86	0.87	26.04	4.71	2.48	7.30	12.30	72.62	51.29	2.78	2.21	175.70	5.52
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	34.12	63.43	37.42	4.31	63.91	3.65	20.99	32.43	42.91	0.47	25.47	2.62	3.35	8.93	11.66	57.48	61.35	3.20	2.23	60.13	6.75
upstream pond	lbs/yr	232.59	48.23	2.75	0.00	3.65	0.00	0.00	94.39	67.17	0.00	3.97	3.35	0.00	0.00	0.00	18.58	0.00	0.00	0.00	79.99	0.00
total inflow	**lbs/yr**	**266.71**	**111.67**	**40.18**	**4.31**	**67.55**	**3.65**	**20.99**	**126.82**	**110.08**	**0.47**	**29.44**	**5.96**	**3.35**	**8.93**	**11.66**	**76.06**	**61.35**	**3.20**	**2.23**	**140.12**	**6.75**
net sedimentation	lbs/yr	0.00	52.49	15.34	1.56	33.93	0.00	12.75	0.00	15.69	0.00	18.37	2.59	0.00	2.01	0.00	38.98	18.44	0.65	0.00	62.94	3.46
outflow	lbs/yr	266.71	59.17	24.84	2.75	33.62	3.65	8.24	126.82	94.39	0.47	11.07	3.37	3.35	6.92	11.66	37.08	42.91	2.55	2.23	77.18	3.29
p removal efficiency	%	0.00	47.01	38.18	36.11	50.23	0.00	60.75	0.00	14.26	0.02	62.40	43.44	0.02	22.50	0.00	51.25	30.05	20.43	0.02	44.92	51.23
upstream w-shed p load	lbs/yr	580.67	129.02	41.73	4.31	67.55	3.65	20.99	206.09	173.66	0.47	32.04	5.96	3.35	8.93	11.66	78.07	61.35	3.20	2.23	199.55	6.75
total removal %	%	54.07	54.14	40.49	36.11	50.23	0.00	60.75	38.46	45.65	0.02	65.44	43.45	0.02	22.50	0.00	52.50	30.05	20.43	0.02	61.32	51.23
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.00	1.43	1.02	1.29	2.74	0.10	2.55	0.10	1.07	0.10	3.00	0.90	0.10	0.47	0.10	2.55	1.19	0.39	0.10	4.18	1.35
relative volume	inches	0.00	6.88	2.44	5.14	7.82	0.00	8.31	0.00	0.78	0.00	14.20	4.65	0.00	0.27	0.00	3.33	0.40	0.43	0.00	6.23	5.17
residence time	years	0.00	0.10	0.06	0.15	0.20	0.00	0.24	0.00	0.01	0.00	0.33	0.06	0.00	0.01	0.00	0.07	0.01	0.01	0.00	0.05	0.15
residence time	days	0.00	36.16	22.28	54.19	73.88	0.00	87.59	0.00	1.89	0.00	119.83	23.12	0.00	2.79	0.00	25.63	4.22	4.55	0.00	19.36	54.50
overflow rate	ft/yr	14.50	14.47	16.68	8.67	13.52	67075.81	10.64	1849044.47	206.48	8650.61	9.14	14.26	24846.05	60.85	122970.46	36.31	102.59	30.93	22109.41	78.79	9.04
inflow phos conc	ppb	199.06	380.34	399.24	322.44	386.08	200.01	449.92	252.34	261.54	200.21	415.94	466.23	495.55	450.02	348.77	385.31	440.07	422.84	370.82	293.41	450.02
outflow phos conc	ppb	199.06	201.55	246.80	206.01	192.16	200.01	176.59	252.34	224.25	200.17	156.38	263.70	495.46	348.77	348.76	187.84	307.81	336.45	370.74	161.62	219.49
p reaction rate	-	0.00	1.67	1.00	0.88	2.03	0.00	3.94	0.00	0.19	0.00	4.41	1.36	0.00	0.37	0.00	2.16	0.61	0.32	0.00	1.48	2.15
1-rp	-	1.00	0.53	0.62	0.64	0.50	1.00	0.39	1.00	0.86	1.00	0.38	0.57	1.00	0.78	1.00	0.49	0.70	0.80	1.00	0.55	0.49
vlawmo pond volume	acre-ft	2.07	3.89	2.32	0.35	4.16	0.48	1.24	2.17	2.56	0.06	1.51	0.16	0.18	0.53	0.89	3.83	3.70	0.20	0.16	3.74	0.40
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	425.62	423.41	384.89	254.92	352.66	200.00	449.58	307.52	432.85	200.05	449.62	436.12	525.65	450.00	333.82	395.22	420.43	406.82	359.85	381.08	450.00
runoff coefficient		0.20	0.21	0.17	0.14	0.12	0.05	0.21	0.16	0.22	0.05	0.22	0.23	0.12	0.22	0.30	0.24	0.20	0.17	0.12	0.16	0.22
dissolved/total P		0.30	0.31	0.38	0.50	0.51	0.60	0.30	0.47	0.32	0.60	0.30	0.30	0.64	0.30	0.34	0.32	0.33	0.38	0.46	0.38	0.30
runoff TSS conc	ppm	149.31	147.42	160.06	191.28	190.18	216.00	140.13	184.83	146.12	215.99	140.00	140.00	203.66	140.00	149.46	147.13	149.41	170.35	202.63	166.25	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	11207.17	20810.34	12708.62	2116.33	26115.36	3926.33	6513.97	12633.02	13607.89	506.23	7909.80	842.66	1268.53	2770.25	4718.44	20388.45	19885.68	1181.91	1121.39	21050.42	2092.65
upstream pond	lbs/yr	36572.29	10936.39	783.04	0.00	3926.33	0.00	0.00	17210.19	10791.37	0.00	833.46	1268.53	0.00	0.00	0.00	6237.13	0.00	0.00	0.00	12420.39	0.00
total inflow	**lbs/yr**	**47779.46**	**31746.74**	**13491.66**	**2116.33**	**30041.70**	**3926.33**	**6513.97**	**29843.21**	**24399.26**	**506.23**	**8743.25**	**2111.19**	**1268.53**	**2770.25**	**4718.44**	**26625.59**	**19885.68**	**1181.91**	**1121.39**	**33470.82**	**2092.65**
p removal efficiency (no inf)	%	0.00	48.00	39.00	37.00	51.00	0.00	61.00	0.00	15.00	0.00	63.00	44.00	0.00	23.00	0.00	52.00	31.00	21.00	0.00	45.00	52.00
tss removal efficiency (no inf)	%	0.00	76.00	65.00	63.00	83.00	0.00	93.00	0.00	29.46	0.00	93.00	69.33	0.00	45.18	0.00	85.00	57.63	41.25	0.00	70.00	85.00
net sedimentation	lbs/yr	0.00	24127.52	8769.58	1333.29	24934.61	0.00	6057.99	0.00	7189.07	0.00	8131.22	1463.76	0.00	1251.56	0.00	22631.75	11459.12	487.54	0.00	23429.57	1778.75
outflow	lbs/yr	47779.46	7619.22	4722.08	783.04	5107.09	3926.33	455.98	29843.21	17210.19	506.23	612.03	647.43	1268.53	1518.69	4718.44	3993.84	8426.56	694.37	1121.39	10041.25	313.90
tss removal efficiency (inf)		0.00	76.00	65.00	63.00	83.00	0.00	93.00	0.00	29.46	0.00	93.00	69.33	0.00	45.18	0.00	85.00	57.63	41.25	0.00	70.00	85.00
upstream watershed tss load	lbs/yr	193077.40	42005.75	14824.95	2116.33	30041.70	3926.33	6513.97	78127.75	65494.73	506.23	10207.01	2111.19	1268.53	2770.25	4718.44	27877.15	19885.68	1181.91	1121.39	68813.25	2092.65
tss total removal efficiency	%	75.25	81.86	68.15	63.00	83.00	0.00	93.00	61.80	73.72	0.00	94.00	69.33	0.00	45.18	0.00	85.67	57.63	41.25	0.00	85.41	85.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**492.95**	**108.02**	**37.02**	**4.92**	**64.37**	**6.71**	**17.17**	**184.90**	**154.86**	**0.87**	**26.04**	**4.71**	**2.48**	**7.30**	**12.30**	**72.62**	**51.29**	**2.78**	**2.21**	**175.70**	**5.52**
Adjusted TP outflow	**lbs/yr**	**266.71**	**59.17**	**24.84**	**2.75**	**33.62**	**3.65**	**8.24**	**126.82**	**94.39**	**0.47**	**11.07**	**3.37**	**3.35**	**6.92**	**11.66**	**37.08**	**42.91**	**2.55**	**2.23**	**77.18**	**3.29**
Adjusted TSS outflow	**lbs/yr**	**47779.46**	**7619.22**	**4722.08**	**783.04**	**5107.09**	**3926.33**	**455.98**	**29843.21**	**17210.19**	**506.23**	**612.03**	**647.43**	**1268.53**	**1518.69**	**4718.44**	**3993.84**	**8426.56**	**694.37**	**1121.39**	**10041.25**	**313.90**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

Farquar Lake

Cobblestone Lake

		EVR-30	EVR-31	EVR-32	EVR-33	EVR-34	EVR-35	EVR-350	EVR-351	EVR-352	EVR-36	EVR-37	EVR-38	EVR-39	EVR-40	EVR-400	EVR-41	EVR-42	EVR-43	EVR-430	EVR-44	EVR-440
Routed TO:		EVR-352	EVR-352	EVR-352	EVR-LL	EVR-LL	EVR-39	EVR-35	EVR-352	EVR-35	EVR-37	EVR-39	EVR-39	EVR-40	EVR-43	EVR-40	EVR-44	EVR-44	EVR-44	EVR-43	Lakeville	EVR-44
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	37.8	6.1	2.8	7.1	14.2	142.2	42.4	21.5	6.8	79.8	25.4	14.3	221.3	116.9	8.9	68.9	169.3	89.8	13.2	334.4	19.9
Total watershed area (w/o wat	acres	36.9	6.0	2.5	5.9	12.3	75.2	42.2	21.5	4.8	79.1	25.3	13.8	217.7	113.4	8.9	68.9	169.3	89.3	13.2	334.4	19.9
basin area	acres	0.85	0.13	0.33	1.25	1.89	67.00	0.20	0.00	2.01	0.64	0.17	0.46	3.53	3.50	0.00	0.00	0.00	0.52	0.00	0.00	0.00
basin volume	acre-ft	1.43	0.06	0.30	2.70	5.35	0.00	0.13	0.00	3.65	1.36	0.10	0.51	3.07	10.51	0.00	0.00	0.00	0.63	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	0%	0%	0%	83%	78%	3%	1%	61%	31%
Farmstead		19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	1%	0%	0%	15%	2%	0%	1%	1%	5%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	35%	0%
Low Density Residential		81%	91%	84%	100%	99%	79%	78%	97%	90%	66%	55%	0%	64%	87%	47%	1%	13%	85%	50%	0%	1%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	3%	0%	0%	0%	0%	0%	0%	0%	28%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	11%	0%	1%	0%	0%	0%	0%	0%	0%	0%	9%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	10%	21%	0%	0%	3%	0%	0%	5%	0%	0%	0%	0%	12%	0%	0%	0%
Open Space		0%	9%	0%	0%	0%	2%	0%	1%	0%	0%	4%	0%	20%	11%	53%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	16%	0%	1%	8%	1%	2%	10%	7%	19%	0%	0%	2%	0%	1%	7%	0%	48%	3%	26%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	36.92	5.99	2.45	5.88	12.27	1914.00	86.83	21.53	383.94	79.14	104.42	13.84	2249.99	2372.31	8.89	68.87	169.32	2474.82	13.23	3227.32	19.91
tributary water area	ac	0.85	0.13	0.33	1.25	1.89	159.70	3.38	0.00	8.78	0.64	0.81	0.46	164.50	168.00	0.00	0.00	0.00	168.52	0.00	168.52	0.00
direct and ponded area	ac	37.77	6.13	2.79	7.13	14.16	2073.70	90.20	21.53	392.72	79.79	105.24	14.29	2414.49	2540.31	8.89	68.87	169.32	2643.33	13.23	3395.84	19.91
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	430.82	426.31	442.02	449.98	449.67	419.99	407.77	446.58	445.08	417.18	415.25	450.00	381.81	421.81	317.19	509.20	514.48	426.67	424.91	346.81	451.16
runoff ortho p/total p	-	0.34	0.33	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.32	0.30	0.36	0.33	0.46	0.25	0.23	0.30	0.30	0.14	0.28
unit runoff	in/yr	6.64	6.91	7.78	7.45	7.46	7.07	6.58	7.43	7.65	8.41	7.72	10.60	6.58	6.87	4.42	4.69	5.48	6.84	8.39	3.29	8.25
unit export	lbs/ac-y	0.66	0.69	0.78	0.76	0.76	0.69	0.64	0.75	0.77	0.78	0.73	1.08	0.62	0.69	0.40	0.55	0.63	0.68	0.80	0.39	0.82
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	20.43	3.45	1.59	3.65	7.63	44.26	23.15	13.32	3.03	55.45	16.27	12.22	119.42	64.90	3.28	26.92	77.38	50.88	9.25	91.79	13.69
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	0.00	950.08	26.04	0.00	220.01	0.00	55.45	0.00	1078.28	1200.98	0.00	0.00	0.00	1275.13	0.00	1542.53	0.00
total inflow	**ac-ft/yr**	**20.43**	**3.45**	**1.59**	**3.65**	**7.63**	**994.35**	**49.19**	**13.32**	**223.04**	**55.45**	**71.71**	**12.22**	**1197.71**	**1265.88**	**3.28**	**26.92**	**77.38**	**1326.01**	**9.25**	**1634.32**	**13.69**
outflow	ac-ft/yr	20.43	3.45	1.59	3.65	7.63	994.35	49.19	13.32	223.04	55.45	71.71	12.22	1197.71	1265.88	3.28	26.92	77.38	1326.01	9.25	1634.32	13.69
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	24.47	4.16	1.90	4.47	9.32	52.19	26.98	16.23	3.66	62.05	18.47	14.95	135.43	77.91	3.54	37.73	106.13	60.84	10.61	131.15	16.26
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	516.60	11.07	0.00	113.39	0.00	35.94	0.00	628.82	713.49	0.00	0.00	0.00	652.47	0.00	976.91	0.00
total inflow	**lbs/yr**	**24.47**	**4.16**	**1.90**	**4.47**	**9.32**	**568.79**	**38.05**	**16.23**	**117.05**	**62.05**	**54.41**	**14.95**	**764.25**	**791.40**	**3.54**	**37.73**	**106.13**	**713.31**	**10.61**	**1108.06**	**16.26**
net sedimentation	lbs/yr	11.82	1.16	0.87	2.70	5.98	0.00	3.61	0.00	28.42	26.10	2.89	6.44	54.29	149.54	0.00	0.00	0.00	12.04	0.00	0.00	0.00
outflow	lbs/yr	12.65	3.00	1.04	1.76	3.34	568.79	34.44	16.23	88.63	35.94	51.52	8.51	709.95	641.86	3.54	37.73	106.12	701.27	10.61	1108.06	16.25
p removal efficiency	%	48.31	27.82	45.58	60.56	64.13	0.00	9.49	0.01	24.28	42.07	5.31	43.10	7.10	18.90	0.01	0.00	0.00	1.69	0.01	0.00	0.01
upstream w-shed p load	lbs/yr	24.47	4.16	1.90	4.47	9.32	1154.69	59.02	16.23	256.72	62.05	80.51	14.95	1385.58	1467.03	3.54	37.73	106.13	1538.48	10.61	1945.27	16.26
total removal %	%	48.31	27.82	45.58	60.56	64.13	50.74	41.64	0.01	65.47	42.07	36.01	43.10	48.76	56.25	0.01	0.00	0.00	54.42	0.01	43.04	0.01
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.68	0.49	0.91	2.16	2.83	0.00	0.64	0.10	1.82	2.11	0.58	1.12	0.87	3.00	0.10	0.10	0.10	1.21	0.10	0.10	0.10
relative volume	inches	2.42	0.65	6.55	25.56	24.27	0.00	0.19	0.00	41.71	0.85	0.21	1.44	0.89	5.61	0.00	0.00	0.00	0.43	0.00	0.00	0.00
residence time	years	0.07	0.02	0.19	0.74	0.70	0.00	0.00	0.00	0.02	0.02	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
residence time	days	25.47	6.84	69.07	269.48	255.86	0.00	0.93	0.00	5.97	8.95	0.49	15.20	0.94	3.03	0.00	0.00	0.00	0.17	0.00	0.00	0.00
overflow rate	ft/yr	24.04	26.33	4.79	2.92	4.04	14.84	250.97	133227.01	110.97	86.10	429.43	26.80	339.29	361.27	32753.79	269179.72	773772.48	2554.93	92466.93	16343169.71	136916.69
inflow phos conc	ppb	440.65	444.08	440.24	450.00	449.61	210.46	284.61	448.30	193.08	411.72	279.14	450.02	234.76	230.01	397.70	515.77	504.61	197.92	422.30	249.45	436.80
outflow phos conc	ppb	227.77	320.53	239.58	177.46	161.29	210.46	257.60	448.27	146.21	238.51	264.31	256.07	218.09	186.55	397.64	515.74	504.61	194.58	422.26	249.45	436.77
p reaction rate	-	1.81	0.53	1.54	3.89	4.98	0.00	0.12	0.00	0.42	1.25	0.06	1.33	0.08	0.29	0.00	0.00	0.00	0.02	0.00	0.00	0.00
1-rp	-	0.52	0.72	0.54	0.39	0.36	1.00	0.91	1.00	0.76	0.58	0.95	0.57	0.93	0.81	1.00	1.00	1.00	0.98	1.00	1.00	1.00
vlawmo pond volume	acre-ft	1.48	0.25	0.11	0.26	0.55	3.20	1.67	0.96	0.22	4.00	1.17	0.88	8.62	4.69	0.24	1.94	5.59	3.67	0.67	6.63	0.99
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	430.82	426.31	442.02	449.98	449.67	419.99	407.77	446.58	445.08	417.18	415.25	450.00	381.81	421.81	317.19	509.20	514.48	426.67	424.91	346.81	451.16
runoff coefficient		0.19	0.20	0.22	0.22	0.22	0.20	0.19	0.21	0.22	0.24	0.22	0.31	0.19	0.20	0.13	0.14	0.16	0.20	0.24	0.10	0.24
dissolved/total P		0.34	0.33	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.32	0.30	0.36	0.33	0.46	0.25	0.23	0.30	0.30	0.14	0.28
runoff TSS conc	ppm	154.58	147.20	140.00	140.00	140.00	149.40	155.92	140.77	140.00	142.70	149.19	140.00	159.90	148.30	180.33	170.34	159.47	149.82	141.17	106.50	150.78
POND TSS BUDGETS.....																						
runoff	lbs/yr	8146.10	1325.51	603.55	1385.04	2894.69	17266.28	9273.65	5061.14	1149.41	21196.56	6324.96	4636.85	47334.02	24996.84	1382.91	12218.31	32868.82	19982.58	3519.94	40187.14	5403.45
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	95278.19	612.03	0.00	17933.17	0.00	6641.59	0.00	125404.79	146977.05	0.00	0.00	0.00	111310.71	0.00	217167.67	0.00
total inflow	**lbs/yr**	**8146.10**	**1325.51**	**603.55**	**1385.04**	**2894.69**	**112544.47**	**9885.68**	**5061.14**	**19082.58**	**21196.56**	**12966.55**	**4636.85**	**172738.81**	**171973.89**	**1382.91**	**12218.31**	**32868.82**	**131293.30**	**3519.94**	**257354.81**	**5403.45**
p removal efficiency (no inf)	%	49.00	28.00	46.00	61.00	65.00	0.00	10.00	0.00	25.00	43.00	6.00	44.00	8.00	19.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	78.50	55.00	72.00	93.00	93.00	0.00	19.64	0.00	49.11	68.67	11.79	69.33	15.71	37.32	0.00	0.00	0.00	3.93	0.00	0.00	0.00
net sedimentation	lbs/yr	6394.69	729.03	434.56	1288.09	2692.06	0.00	1941.83	0.00	9370.91	14554.97	1528.20	3214.88	27144.67	64183.11	0.00	0.00	0.00	5157.95	0.00	0.00	0.00
outflow	lbs/yr	1751.41	596.48	168.99	96.95	202.63	112544.47	7943.85	5061.14	9711.67	6641.59	11438.35	1421.97	145594.14	107790.78	1382.91	12218.31	32868.82	126135.35	3519.94	257354.81	5403.45
tss removal efficiency (inf)		78.50	55.00	72.00	93.00	93.00	0.00	19.64	0.00	49.11	68.67	11.79	69.33	15.71	37.32	0.00	0.00	0.00	3.93	0.00	0.00	0.00
upstream watershed tss load	lbs/yr	8146.10	1325.51	603.55	1385.04	2894.69	395143.70	19480.66	5061.14	87191.61	21196.56	27521.52	4636.85	474636.09	501015.84	1382.91	12218.31	32868.82	524518.36	3519.94	655737.82	5403.45
tss total removal efficiency	%	78.50	55.00	72.00	93.00	93.00	71.52	59.22	0.00	88.86	68.67	58.44	69.33	69.33	78.49	0.00	0.00	0.00	75.95	0.00	60.75	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**20.43**	**3.45**	**1.59**	**3.65**	**7.63**	**994.35**	**49.19**	**13.32**	**223.04**	**55.45**	**71.71**	**12.22**	**1197.71**	**1265.88**	**3.28**	**26.92**	**77.38**	**1326.01**	**9.25**	**1634.32**	**13.69**
Adjusted TP outflow	**lbs/yr**	**12.65**	**3.00**	**1.04**	**1.76**	**3.34**	**568.79**	**34.44**	**16.23**	**88.63**	**35.94**	**51.52**	**8.51**	**709.95**	**641.86**	**3.54**	**37.73**	**106.12**	**701.27**	**10.61**	**1108.06**	**16.25**
Adjusted TSS outflow	**lbs/yr**	**1751.41**	**596.48**	**168.99**	**96.95**	**202.63**	**112544.47**	**7943.85**	**5061.14**	**9711.67**	**6641.59**	**11438.35**	**1421.97**	**145594.14**	**107790.78**	**1382.91**	**12218.31**	**32868.82**	**126135.35**	**3519.94**	**257354.81**	**5403.45**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

Keller Lake

		EVR-45	EVR-46	EVR-47	EVR-48	EVR-49	EVR-50	EVR-51	EVR-52	EVR-53	EVR-54	EVR-55	EVR-550	EVR-551	EVR-552	EVR-553	EVR-56	KL-1	KL-2	KL-20	KL-3	KL-300
Routed TO:		EVR-46	EVR-47	Rosemount	EVR-44	EVR-22	EVR-51	EVR-55	EVR-53	EVR-55	EVR-55	EVR-13	EVR-LL	EVR-LL	EVR-LL	EVR-LL	EVR-45	KL-2	KL-20	Burnsville	KL-2	KL-2
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	37.6	9.0	8.5	160.0	0.8	39.9	22.8	6.6	14.5	17.0	39.7	2.4	3.1	2.0	4.8	0.0	202.3	226.1	104.8	113.4	82.0
Total watershed area (w/o wat	acres	36.1	7.5	6.6	160.0	0.8	37.5	22.8	5.8	12.6	16.9	36.1	2.1	3.1	1.9	4.4	0.0	200.7	226.1	104.8	111.0	82.0
basin area	acres	1.42	1.50	1.92	0.00	0.00	2.43	0.00	0.80	1.94	0.17	3.59	0.36	0.00	0.11	0.41	0.00	1.52	0.00	0.00	2.47	0.00
basin volume	acre-ft	3.33	3.63	5.49	0.00	0.00	8.08	0.00	1.30	5.59	0.09	17.15	0.34	0.00	0.05	0.42	0.00	5.59	0.00	0.00	8.33	0.00
Row Crop Agriculture		0%	0%	0%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		99%	63%	0%	1%	98%	94%	85%	0%	0%	67%	35%	33%	24%	62%	64%	100%	77%	84%	72%	90%	61%
Medium Density Residential		0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%	23%	0%	4%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	0%	0%	0%	0%	8%	4%	4%	5%	5%
Open Space		0%	31%	88%	8%	0%	0%	0%	84%	75%	14%	6%	62%	57%	38%	31%	0%	0%	2%	0%	4%	9%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		1%	6%	12%	7%	2%	3%	7%	0%	22%	0%	53%	4%	19%	0%	6%	0%	4%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	2%	7%	16%	4%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	36.18	43.70	50.30	159.99	0.79	37.49	60.29	5.83	18.41	16.88	131.71	2.09	3.13	1.86	4.40	0.04	200.70	619.78	724.56	110.97	82.04
tributary water area	ac	1.42	2.91	4.84	0.00	0.00	2.43	2.43	0.80	2.75	0.17	8.93	0.36	0.00	0.11	0.41	0.00	1.52	3.99	3.99	2.47	0.00
direct and ponded area	ac	37.60	46.61	55.14	159.99	0.79	39.92	62.72	6.63	21.15	17.04	140.64	2.44	3.13	1.97	4.80	0.04	202.22	623.77	728.56	113.44	82.04
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	449.58	369.44	223.73	460.70	449.09	443.82	431.72	208.06	245.29	376.20	397.28	292.53	297.19	355.45	370.28	449.61	421.19	427.84	418.15	428.81	412.85
runoff ortho p/total p	-	0.30	0.39	0.56	0.27	0.30	0.30	0.30	0.55	0.52	0.34	0.32	0.49	0.47	0.41	0.39	0.30	0.30	0.31	0.30	0.31	0.33
unit runoff	in/yr	7.46	5.78	2.66	7.39	7.48	7.45	7.37	2.14	3.52	5.83	8.04	3.99	4.58	5.29	5.81	7.45	7.74	7.66	8.25	7.00	7.57
unit export	lbs/ac-y	0.76	0.55	0.17	0.72	0.76	0.75	0.73	0.10	0.26	0.55	0.75	0.34	0.39	0.50	0.56	0.76	0.74	0.75	0.77	0.70	0.74
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	22.48	3.62	1.46	98.54	0.49	23.27	14.01	1.04	3.69	8.20	24.20	0.69	1.19	0.82	2.13	0.02	129.37	144.33	72.06	64.75	51.73
upstream pond	ac-ft/yr	0.02	22.51	26.13	0.00	0.00	0.00	23.27	0.00	1.04	0.00	50.21	0.00	0.00	0.00	0.00	0.00	0.00	245.84	390.18	0.00	0.00
total inflow	**ac-ft/yr**	**22.51**	**26.13**	**27.59**	**98.54**	**0.49**	**23.27**	**37.28**	**1.04**	**4.73**	**8.20**	**74.41**	**0.69**	**1.19**	**0.82**	**2.13**	**0.02**	**129.37**	**390.18**	**462.24**	**64.75**	**51.73**
outflow	ac-ft/yr	22.51	26.13	27.59	98.54	0.49	23.27	37.28	1.04	4.73	8.20	74.41	0.69	1.19	0.82	2.13	0.02	129.37	390.18	462.24	64.75	51.73
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	27.47	4.16	1.13	115.53	0.60	28.16	16.63	0.61	3.21	9.32	26.94	0.71	1.22	0.94	2.44	0.03	148.88	168.53	81.03	77.80	60.94
upstream pond	lbs/yr	0.03	11.52	9.09	0.00	0.00	0.00	9.93	0.00	0.40	0.00	35.47	0.00	0.00	0.00	0.00	0.00	0.00	163.29	331.81	0.00	0.00
total inflow	**lbs/yr**	**27.50**	**15.68**	**10.23**	**115.53**	**0.60**	**28.16**	**26.56**	**0.61**	**3.62**	**9.32**	**62.41**	**0.71**	**1.22**	**0.94**	**2.44**	**0.03**	**148.88**	**331.81**	**412.84**	**77.80**	**60.94**
net sedimentation	lbs/yr	15.97	6.59	3.21	0.00	0.00	18.23	0.00	0.21	1.77	2.25	38.10	0.26	0.00	0.25	1.04	0.00	77.42	0.00	0.00	46.92	0.00
outflow	lbs/yr	11.52	9.09	7.02	115.53	0.60	9.93	26.56	0.40	1.85	7.07	24.31	0.45	1.22	0.69	1.41	0.03	71.46	331.81	412.84	30.88	60.94
p removal efficiency	%	58.10	42.00	31.40	0.00	0.17	64.73	0.00	34.19	48.94	24.16	61.05	36.46	0.04	26.45	42.38	2.89	52.00	0.00	0.00	60.31	0.00
upstream w-shed p load	lbs/yr	27.50	31.65	32.79	115.53	0.60	28.16	44.79	0.61	3.82	9.32	84.87	0.71	1.22	0.94	2.44	0.03	148.88	456.15	537.19	77.80	60.94
total removal %	%	58.10	71.27	78.60	0.00	0.17	64.73	40.70	34.19	51.74	24.16	71.36	36.46	0.04	26.45	42.38	2.89	52.00	27.26	23.15	60.31	0.00
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	2.35	2.43	2.86	0.10	0.10	3.33	0.10	1.62	2.88	0.57	4.77	0.95	0.10	0.44	1.03	0.10	3.68	0.10	0.10	3.37	0.10
relative volume	inches	5.13	34.67	130.07	0.00	0.00	12.03	0.00	43.14	52.46	0.40	24.54	16.77	0.00	2.04	6.83	0.02	1.50	0.00	0.00	4.46	0.00
residence time	years	0.15	0.14	0.20	0.00	0.00	0.35	0.00	1.25	1.18	0.01	0.23	0.48	0.00	0.06	0.20	0.00	0.04	0.00	0.00	0.13	0.00
residence time	days	53.98	50.69	72.68	0.00	0.01	126.80	0.00	454.80	431.39	4.21	84.14	176.83	0.00	21.52	71.98	0.16	15.77	0.00	0.00	46.98	0.00
overflow rate	ft/yr	15.86	17.48	14.36	985379.88	4903.02	9.59	372770.93	1.30	2.44	49.69	20.70	1.96	11936.67	7.46	5.25	230.56	85.11	3901763.34	4622368.12	26.20	517286.26
inflow phos conc	ppb	449.48	220.77	136.38	431.35	448.88	445.26	262.14	216.16	281.00	418.22	308.58	377.36	375.81	419.05	422.42	449.74	423.42	312.88	328.60	442.10	433.45
outflow phos conc	ppb	188.34	128.04	93.55	431.35	448.12	157.03	262.14	142.26	143.47	317.18	120.20	239.76	375.67	308.21	243.39	436.76	203.24	312.88	328.60	175.48	433.44
p reaction rate	-	3.31	1.25	0.67	0.00	0.00	5.20	0.00	0.79	1.88	0.42	4.02	0.90	0.00	0.49	1.28	0.03	2.26	0.00	0.00	3.83	0.00
1-rp	-	0.42	0.58	0.69	1.00	1.00	0.35	1.00	0.66	0.51	0.76	0.39	0.64	1.00	0.74	0.58	0.97	0.48	1.00	1.00	0.40	1.00
vlawmo pond volume	acre-ft	1.62	0.26	0.11	7.12	0.04	1.68	1.01	0.08	0.27	0.59	1.75	0.05	0.09	0.06	0.15	0.00	9.34	10.42	5.20	4.68	3.74
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	449.58	369.44	223.73	460.70	449.09	443.82	431.72	208.06	245.29	376.20	397.28	292.53	297.19	355.45	370.28	449.61	421.19	427.84	418.15	428.81	412.85
runoff coefficient		0.22	0.17	0.08	0.21	0.22	0.22	0.21	0.06	0.10	0.17	0.23	0.12	0.13	0.15	0.17	0.22	0.22	0.22	0.24	0.20	0.22
dissolved/total P		0.30	0.39	0.56	0.27	0.30	0.30	0.30	0.55	0.52	0.34	0.32	0.49	0.47	0.41	0.39	0.30	0.30	0.31	0.30	0.31	0.33
runoff TSS conc	ppm	140.00	163.65	206.98	162.66	140.00	141.70	145.54	216.00	199.46	165.33	148.79	187.19	183.54	168.74	163.36	140.07	145.82	144.08	143.28	147.15	150.71
POND TSS BUDGETS.....																						
runoff	lbs/yr	8530.14	1444.29	727.67	40541.74	186.02	8889.97	5437.24	609.65	1712.35	3361.38	9391.05	301.88	506.15	332.44	848.09	8.75	49935.12	55336.25	27591.68	25028.36	20079.45
upstream pond	lbs/yr	8.23	597.69	639.82	0.00	0.00	0.00	622.30	0.00	237.00	0.00	8189.35	0.00	0.00	0.00	0.00	0.00	0.00	28073.33	83409.58	0.00	0.00
total inflow	**lbs/yr**	**8538.38**	**2041.98**	**1367.49**	**40541.74**	**186.02**	**8889.97**	**6059.54**	**609.65**	**1949.35**	**3361.38**	**17580.40**	**301.88**	**506.15**	**332.44**	**848.09**	**8.75**	**49935.12**	**83409.58**	**111001.26**	**25028.36**	**20079.45**
p removal efficiency (no inf)	%	59.00	43.00	32.00	0.00	0.00	65.00	0.00	35.00	49.00	25.00	62.00	37.00	0.00	27.00	43.00	3.00	53.00	0.00	0.00	61.00	0.00
tss removal efficiency (no inf)	%	93.00	68.67	58.50	0.00	0.00	93.00	0.00	61.13	78.50	49.11	93.00	63.00	0.00	53.04	68.67	5.89	87.50	0.00	0.00	93.00	0.00
net sedimentation	lbs/yr	7940.69	1402.16	799.98	0.00	0.00	8267.67	0.00	372.65	1530.24	1650.68	16349.77	190.18	0.00	176.31	582.36	0.52	43693.23	0.00	0.00	23276.37	0.00
outflow	lbs/yr	597.69	639.82	567.51	40541.74	186.02	622.30	6059.54	237.00	419.11	1710.70	1230.63	111.70	506.15	156.13	265.74	8.23	6241.89	83409.58	111001.26	1751.98	20079.45
tss removal efficiency (inf)		93.00	68.67	58.50	0.00	0.00	93.00	0.00	61.13	78.50	49.11	93.00	63.00	0.00	53.04	68.67	5.89	87.50	0.00	0.00	93.00	0.00
upstream watershed tss load	lbs/yr	8538.90	9983.19	10710.86	40541.74	186.02	8889.97	14327.21	609.65	2322.00	3361.38	29401.64	301.88	506.15	332.44	848.09	8.75	49935.12	150379.18	177970.86	25028.36	20079.45
tss total removal efficiency	%	93.00	93.59	94.70	0.00	0.00	93.00	57.71	61.13	81.95	49.11	95.81	63.00	0.00	53.04	68.67	5.89	87.50	44.53	37.63	93.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**22.51**	**26.13**	**27.59**	**98.54**	**0.49**	**23.27**	**37.28**	**1.04**	**4.73**	**8.20**	**74.41**	**0.69**	**1.19**	**0.82**	**2.13**	**0.02**	**129.37**	**390.18**	**462.24**	**64.75**	**51.73**
Adjusted TP outflow	**lbs/yr**	**11.52**	**9.09**	**7.02**	**115.53**	**0.60**	**9.93**	**26.56**	**0.40**	**1.85**	**7.07**	**24.31**	**0.45**	**1.22**	**0.69**	**1.41**	**0.03**	**71.46**	**331.81**	**412.84**	**30.88**	**60.94**
Adjusted TSS outflow	**lbs/yr**	**597.69**	**639.82**	**567.51**	**40541.74**	**186.02**	**622.30**	**6059.54**	**237.00**	**419.11**	**1710.70**	**1230.63**	**111.70**	**506.15**	**156.13**	**265.74**	**8.23**	**6241.89**	**83409.58**	**111001.26**	**1751.98**	**20079.45**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		KL-4	LL-1	WVR-1	WVR-2	WVR-3	WVR-4	WVR-5	WVR-6	WVR-7	WVR-710	WVR-711	WVR-8	WVR-9	WVR-10	WVR-11	WVR-111	WVR-112	WVR-113	WVR-12	WVR-13	WVR-130
Routed TO:		WVR-46	Burnsville	WVR-2	WVR-5	WVR-5	WVR-5	WVR-17	WVR-111	WVR-711	WVR-7	WVR-LL	WVR-9	WVR-17	WVR-LL	WVR-17	WVR-17	WVR-11	WVR-112	WVR-17	WVR-17	WVR-17
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	73.7	156.1	6.6	4.2	3.2	14.8	51.7	8.4	12.2	8.4	9.2	15.4	39.2	9.5	8.5	12.2	11.3	12.4	2.4	91.0	15.4
Total watershed area (w/o wat	acres	72.2	96.3	6.3	3.7	3.1	14.8	42.8	8.4	12.2	8.4	8.1	15.2	37.9	8.9	8.2	12.0	11.3	12.3	2.2	91.0	15.4
basin area	acres	1.51	59.75	0.36	0.59	0.13	0.00	8.90	0.00	0.00	0.00	1.15	0.29	1.33	0.58	0.33	0.15	0.08	0.12	0.15	0.00	0.08
basin volume	acre-ft	4.37	0.00	0.35	0.78	0.06	0.00	26.70	0.00	0.00	0.00	2.36	0.24	2.98	0.76	0.30	0.08	0.00	0.06	0.08	0.00	0.03
Row Crop Agriculture		4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		3%	88%	100%	100%	100%	27%	75%	40%	93%	51%	14%	100%	100%	97%	58%	99%	100%	99%	13%	40%	46%
Medium Density Residential		4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		61%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	17%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	6%	0%	0%	0%	0%	8%	0%	7%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	18%
Open Space		0%	5%	0%	0%	0%	58%	0%	48%	0%	0%	0%	0%	0%	3%	41%	0%	0%	1%	69%	8%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		26%	1%	0%	0%	0%	15%	3%	11%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	17%	42%	18%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	72.21	96.31	9.26	12.92	3.10	14.76	73.58	8.38	20.65	8.44	28.73	15.16	53.05	8.91	31.76	20.41	23.56	12.31	2.22	91.02	15.35
tributary water area	ac	1.51	59.75	0.72	1.31	0.13	0.00	10.34	0.00	0.00	0.00	1.15	0.29	1.61	0.58	0.53	0.15	0.20	0.12	0.15	0.00	0.08
direct and ponded area	ac	73.72	156.05	9.99	14.23	3.23	14.76	83.92	8.38	20.65	8.44	29.88	15.44	54.66	9.49	32.29	20.56	23.76	12.43	2.37	91.02	15.43
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	376.48	425.32	450.00	450.00	450.00	298.66	431.63	323.35	436.16	351.55	277.95	449.01	449.58	442.60	346.18	449.75	449.55	447.79	267.77	395.48	386.91
runoff ortho p/total p	-	0.30	0.31	0.30	0.30	0.30	0.47	0.30	0.45	0.30	0.30	0.30	0.30	0.30	0.31	0.42	0.30	0.30	0.30	0.51	0.33	0.30
unit runoff	in/yr	12.65	6.98	7.45	7.45	7.45	4.47	8.13	4.92	7.16	5.38	4.74	7.43	7.44	7.30	5.08	7.46	7.44	7.40	3.85	8.00	7.78
unit export	lbs/ac-y	1.05	0.70	0.76	0.76	0.76	0.38	0.81	0.44	0.72	0.48	0.32	0.76	0.76	0.74	0.48	0.76	0.76	0.75	0.31	0.74	0.70
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	76.11	56.04	3.89	2.27	1.92	5.50	29.01	3.43	7.28	3.78	3.19	9.38	23.49	5.41	3.47	7.47	6.97	7.59	0.71	60.70	9.95
upstream pond	ac-ft/yr	0.00	0.00	1.86	5.75	0.00	0.00	15.44	0.00	3.78	0.00	11.06	0.00	9.38	0.00	14.56	3.43	7.59	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**76.11**	**56.04**	**5.75**	**8.02**	**1.92**	**5.50**	**44.45**	**3.43**	**11.06**	**3.78**	**14.25**	**9.38**	**32.86**	**5.41**	**18.03**	**10.91**	**14.56**	**7.59**	**0.71**	**60.70**	**9.95**
outflow	ac-ft/yr	76.11	56.04	5.75	8.02	1.92	5.50	44.45	3.43	11.06	3.78	14.25	9.38	32.86	5.41	18.03	10.91	14.56	7.59	0.71	60.70	9.95
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	76.02	66.99	4.75	2.77	2.35	5.66	34.82	3.70	8.78	4.02	2.55	11.46	28.72	6.59	3.91	9.14	8.53	9.27	0.68	67.48	10.76
upstream pond	lbs/yr	0.00	0.00	1.21	3.54	0.00	0.00	10.92	0.00	4.01	0.00	12.80	0.00	7.28	0.00	15.75	3.70	7.23	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**76.02**	**66.99**	**5.96**	**6.32**	**2.35**	**5.66**	**45.74**	**3.70**	**12.80**	**4.02**	**15.34**	**11.46**	**36.00**	**6.59**	**19.66**	**12.83**	**15.75**	**9.27**	**0.68**	**67.48**	**10.76**
net sedimentation	lbs/yr	38.83	0.00	2.42	2.65	0.76	0.00	28.46	0.00	0.00	0.00	8.43	4.18	19.24	3.30	5.20	2.93	0.00	2.04	0.17	0.00	1.31
outflow	lbs/yr	37.18	66.99	3.54	3.67	1.60	5.66	17.28	3.70	12.80	4.01	6.91	7.28	16.75	3.29	14.47	9.90	15.75	7.23	0.51	67.48	9.45
p removal efficiency	%	51.09	0.00	40.58	41.99	32.09	0.01	62.23	0.01	0.01	0.02	54.94	36.46	53.46	50.09	26.43	22.86	0.00	22.04	24.51	0.00	12.16
upstream w-shed p load	lbs/yr	76.02	66.99	7.03	9.80	2.35	5.66	52.64	3.70	12.80	4.02	15.35	11.46	40.18	6.59	21.71	12.84	17.80	9.27	0.68	67.48	10.76
total removal %	%	51.09	0.00	49.59	62.62	32.09	0.01	67.17	0.01	0.01	0.02	54.95	36.46	58.30	50.09	33.36	22.86	11.48	22.04	24.51	0.00	12.16
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	2.89	0.00	0.96	1.32	0.49	0.10	3.00	0.10	0.10	0.10	2.05	0.82	2.24	1.31	0.90	0.55	0.00	0.47	0.54	0.10	0.36
relative volume	inches	1.99	0.00	3.09	11.86	1.12	0.00	31.87	0.00	0.00	0.00	25.68	0.87	4.39	4.87	2.99	0.39	0.00	0.26	3.93	0.00	0.10
residence time	years	0.06	0.00	0.06	0.10	0.03	0.00	0.60	0.00	0.00	0.00	0.17	0.03	0.09	0.14	0.02	0.01	0.00	0.01	0.11	0.00	0.00
residence time	days	20.96	0.00	22.06	35.39	11.80	0.00	219.24	0.00	0.00	0.00	60.56	9.15	33.05	51.37	6.06	2.80	0.00	2.69	41.43	0.00	1.05
overflow rate	ft/yr	50.40	0.94	15.88	13.61	15.03	55031.95	4.99	34322.02	110645.98	37821.36	12.35	32.79	24.79	9.30	54.48	71.29	182.00	63.23	4.75	606980.91	124.34
inflow phos conc	ppb	367.47	439.83	381.81	290.02	450.02	378.34	378.59	396.48	425.57	390.64	396.11	449.59	402.99	447.97	401.22	432.93	398.08	449.50	350.29	409.02	397.92
outflow phos conc	ppb	179.74	439.83	226.87	168.23	305.60	378.30	143.01	396.43	425.54	390.56	178.47	285.66	187.57	223.57	295.17	333.98	398.06	350.44	264.43	409.01	349.54
p reaction rate	-	2.14	0.00	1.15	1.25	0.70	0.00	4.36	0.00	0.00	0.00	2.71	0.90	2.47	2.01	0.49	0.38	0.00	0.36	0.43	0.00	0.16
1-rp	-	0.49	1.00	0.59	0.58	0.68	1.00	0.38	1.00	1.00	1.00	0.45	0.64	0.47	0.50	0.74	0.77	1.00	0.78	0.75	1.00	0.88
vlawmo pond volume	acre-ft	5.50	4.05	0.28	0.16	0.14	0.40	2.09	0.25	0.53	0.27	0.23	0.68	1.70	0.39	0.25	0.54	0.50	0.55	0.05	4.38	0.72
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	376.48	425.32	450.00	450.00	450.00	298.66	431.63	323.35	436.16	351.55	277.95	449.01	449.58	442.60	346.18	449.75	449.55	447.79	267.77	395.48	386.91
runoff coefficient		0.37	0.20	0.22	0.22	0.22	0.13	0.23	0.14	0.21	0.16	0.14	0.21	0.21	0.21	0.15	0.22	0.21	0.21	0.11	0.23	0.22
dissolved/total P		0.30	0.31	0.30	0.30	0.30	0.47	0.30	0.45	0.30	0.30	0.30	0.30	0.30	0.31	0.42	0.30	0.30	0.30	0.51	0.33	0.30
runoff TSS conc	ppm	140.87	148.03	140.00	140.00	140.00	183.72	146.46	176.79	145.26	177.41	205.38	140.38	140.16	142.17	171.52	140.00	140.14	140.67	192.75	149.06	153.94
POND TSS BUDGETS.....																						
runoff	lbs/yr	28942.89	21709.39	1474.38	860.58	730.14	2340.18	11207.64	1422.68	2810.01	1666.22	1721.81	3562.37	8915.22	2061.61	1418.56	2835.98	2645.74	2882.10	316.14	23434.00	3929.59
upstream pond	lbs/yr	0.00	0.00	183.65	547.15	0.00	0.00	3087.27	0.00	1666.22	0.00	4476.24	0.00	1318.08	0.00	4225.75	1422.68	1580.01	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**28942.89**	**21709.39**	**1658.03**	**1407.73**	**730.14**	**2340.18**	**14294.91**	**1422.68**	**4476.24**	**1666.22**	**6198.05**	**3562.37**	**10233.30**	**2061.61**	**5644.30**	**4258.67**	**4225.75**	**2882.10**	**316.14**	**23434.00**	**3929.59**
p removal efficiency (no inf)	%	52.00	0.00	41.00	42.00	33.00	0.00	63.00	0.00	0.00	0.00	55.00	37.00	54.00	51.00	27.00	23.00	0.00	23.00	25.00	0.00	13.00
tss removal efficiency (no inf)	%	85.00	0.00	67.00	68.00	59.38	0.00	93.00	0.00	0.00	0.00	91.50	63.00	90.00	83.00	53.04	45.18	0.00	45.18	49.11	0.00	25.54
net sedimentation	lbs/yr	24601.46	0.00	1110.88	957.26	433.52	0.00	13294.27	0.00	0.00	0.00	5671.22	2244.29	9209.97	1711.13	2993.50	1924.00	0.00	1302.09	155.25	0.00	1003.45
outflow	lbs/yr	4341.43	21709.39	547.15	450.47	296.62	2340.18	1000.64	1422.68	4476.24	1666.22	526.83	1318.08	1023.33	350.47	2650.81	2334.66	4225.75	1580.01	160.89	23434.00	2926.14
tss removal efficiency (inf)		85.00	0.00	67.00	68.00	59.38	0.00	93.00	0.00	0.00	0.00	91.50	63.00	90.00	83.00	53.04	45.18	0.00	45.18	49.11	0.00	25.54
upstream watershed tss load	lbs/yr	28942.89	21709.39	2180.74	3041.32	730.14	2340.18	17319.28	1422.68	4476.24	1666.22	6198.05	3562.37	12477.59	2061.61	6946.40	4258.67	5527.84	2882.10	316.14	23434.00	3929.59
tss total removal efficiency	%	85.00	0.00	74.91	85.19	59.38	0.00	94.22	0.00	0.00	0.00	91.50	63.00	91.80	83.00	61.84	45.18	23.56	45.18	49.11	0.00	25.54
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**76.11**	**56.04**	**5.75**	**8.02**	**1.92**	**5.50**	**44.45**	**3.43**	**11.06**	**3.78**	**14.25**	**9.38**	**32.86**	**5.41**	**18.03**	**10.91**	**14.56**	**7.59**	**0.71**	**60.70**	**9.95**
Adjusted TP outflow	**lbs/yr**	**37.18**	**66.99**	**3.54**	**3.67**	**1.60**	**5.66**	**17.28**	**3.70**	**12.80**	**4.01**	**6.91**	**7.28**	**16.75**	**3.29**	**14.47**	**9.90**	**15.75**	**7.23**	**0.51**	**67.48**	**9.45**
Adjusted TSS outflow	**lbs/yr**	**4341.43**	**21709.39**	**547.15**	**450.47**	**296.62**	**2340.18**	**1000.64**	**1422.68**	**4476.24**	**1666.22**	**526.83**	**1318.08**	**1023.33**	**350.47**	**2650.81**	**2334.66**	**4225.75**	**1580.01**	**160.89**	**23434.00**	**2926.14**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		WVR-14	WVR-15	WVR-16	WVR-17	WVR-170	WVR-171	WVR-172	WVR-18	WVR-19	WVR-190	WVR-191	WVR-20	WVR-201	WVR-202	WVR-21	WVR-22	WVR-23	WVR-230	WVR-231	WVR-24	WVR-25
Routed TO:		WVR-LL	WVR-LL	WVR-LL	WVR-29	WVR-LL	WVR-17	WVR-171	WVR-17	WVR-21	WVR-LL	WVR-19	WVR-22	WVR-LL	WVR-LL	WVR-22	WVR-23	WVR-231	WVR-23	WVR-26	WVR-26	WVR-26
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	11.9	8.3	7.0	206.2	2.0	2.5	3.7	20.7	57.0	13.7	19.8	9.4	13.7	3.7	25.0	70.6	148.3	10.8	16.4	24.7	11.1
Total watershed area (w/o wat	acres	10.9	8.0	6.9	202.2	1.9	2.2	3.7	20.2	56.8	13.6	19.8	9.4	13.6	3.7	24.8	69.4	148.2	10.8	15.3	24.7	11.1
basin area	acres	0.92	0.37	0.09	3.98	0.11	0.27	0.00	0.53	0.18	0.10	0.03	0.00	0.07	0.04	0.20	1.27	0.12	0.00	1.12	0.00	0.00
basin volume	acre-ft	1.63	0.36	0.04	11.94	0.05	0.21	0.00	0.65	0.11	0.04	0.01	0.00	0.02	0.01	0.13	2.77	0.05	0.00	2.24	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	1%	0%	0%	0%	44%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		61%	61%	26%	55%	0%	63%	74%	45%	81%	100%	86%	100%	100%	100%	100%	92%	69%	95%	42%	100%	15%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%
High Density Residential		0%	0%	0%	8%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	16%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		19%	39%	74%	1%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%
Open Space		0%	0%	0%	20%	0%	0%	0%	0%	19%	0%	1%	0%	0%	0%	0%	3%	9%	0%	34%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	16%	0%	37%	26%	11%	0%	0%	13%	0%	0%	0%	0%	4%	13%	5%	0%	0%	0%
Minnesota Zoological Gardens		19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	10.93	7.96	6.90	564.93	1.88	5.90	3.69	20.21	117.12	13.58	19.76	9.45	13.61	3.69	141.88	220.70	379.69	10.78	395.01	24.68	11.07
tributary water area	ac	0.92	0.37	0.09	26.96	0.11	0.27	0.00	0.53	0.52	0.10	0.03	0.00	0.07	0.04	0.72	1.99	2.11	0.00	3.22	0.00	0.00
direct and ponded area	ac	11.85	8.34	7.00	591.89	1.99	6.17	3.69	20.74	117.64	13.68	19.80	9.45	13.68	3.73	142.60	222.69	381.79	10.78	398.23	24.68	11.07
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	372.38	372.96	301.01	390.99	251.61	431.71	437.21	400.49	402.24	450.00	441.15	450.00	450.00	450.00	450.00	439.74	420.17	447.74	348.67	450.00	415.66
runoff ortho p/total p	-	0.30	0.30	0.30	0.36	0.30	0.30	0.30	0.39	0.36	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.33	0.30	0.40	0.30	0.30
unit runoff	in/yr	6.02	5.83	4.32	7.24	3.34	8.22	7.98	5.83	6.35	7.45	7.65	7.45	7.45	7.45	7.45	7.35	7.72	7.54	6.34	7.45	11.09
unit export	lbs/ac-y	0.55	0.54	0.33	0.70	0.19	0.80	0.79	0.55	0.63	0.76	0.77	0.76	0.76	0.76	0.76	0.74	0.76	0.76	0.60	0.76	1.03
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	5.48	3.87	2.48	122.06	0.52	1.51	2.46	9.81	30.07	8.42	12.61	5.86	8.44	2.29	15.36	42.50	95.28	6.78	8.09	15.32	10.23
upstream pond	ac-ft/yr	0.00	0.00	0.00	214.65	0.00	2.46	0.00	0.00	36.68	0.00	0.00	0.00	0.00	0.00	66.75	87.97	137.25	0.00	232.53	0.00	0.00
total inflow	**ac-ft/yr**	**5.48**	**3.87**	**2.48**	**336.71**	**0.52**	**3.97**	**2.46**	**9.81**	**66.75**	**8.42**	**12.61**	**5.86**	**8.44**	**2.29**	**82.11**	**130.47**	**232.53**	**6.78**	**240.62**	**15.32**	**10.23**
outflow	ac-ft/yr	5.48	3.87	2.48	336.71	0.52	3.97	2.46	9.81	66.75	8.42	12.61	5.86	8.44	2.29	82.11	130.47	232.53	6.78	240.62	15.32	10.23
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	5.98	4.28	2.28	141.35	0.36	1.76	2.90	11.11	35.71	10.30	15.13	7.17	10.33	2.80	18.79	51.44	113.03	8.24	9.20	18.74	11.35
upstream pond	lbs/yr	0.00	0.00	0.00	154.82	0.00	2.90	0.00	0.00	35.23	0.00	0.00	0.00	0.00	0.00	65.51	84.43	91.46	0.00	202.01	0.00	0.00
total inflow	**lbs/yr**	**5.98**	**4.28**	**2.28**	**296.17**	**0.36**	**4.66**	**2.90**	**11.11**	**70.94**	**10.30**	**15.13**	**7.17**	**10.33**	**2.80**	**84.30**	**135.87**	**204.49**	**8.24**	**211.22**	**18.74**	**11.35**
net sedimentation	lbs/yr	3.28	1.87	0.49	121.50	0.09	1.85	0.00	4.58	5.43	1.89	0.49	0.00	1.32	0.37	7.04	52.64	2.48	0.00	45.28	0.00	0.00
outflow	lbs/yr	2.71	2.41	1.79	174.67	0.27	2.81	2.90	6.53	65.51	8.41	14.64	7.17	9.01	2.43	77.26	83.23	202.01	8.23	165.94	18.73	11.35
p removal efficiency	%	54.77	43.68	21.38	41.02	24.84	39.76	0.03	41.19	7.66	18.35	3.26	0.01	12.75	13.33	8.35	38.74	1.21	0.01	21.44	0.01	0.01
upstream w-shed p load	lbs/yr	5.98	4.28	2.28	386.51	0.36	4.67	2.90	11.11	80.06	10.30	15.13	7.17	10.33	2.80	98.85	157.46	278.72	8.24	287.93	18.74	11.35
total removal %	%	54.77	43.68	21.38	54.81	24.84	39.78	0.03	41.19	18.18	18.35	3.26	0.01	12.75	13.33	21.85	47.15	27.52	0.01	42.37	0.01	0.01
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.77	0.98	0.39	3.00	0.44	0.79	0.10	1.23	0.61	0.42	0.19	0.10	0.33	0.22	0.65	2.18	0.46	0.10	2.00	0.10	0.10
relative volume	inches	10.32	3.27	0.49	3.39	3.26	4.89	0.00	2.30	0.13	0.17	0.02	0.00	0.09	0.13	0.29	2.26	0.02	0.00	9.57	0.00	0.00
residence time	years	0.30	0.09	0.01	0.04	0.09	0.05	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00
residence time	days	108.78	34.45	5.20	12.95	34.38	19.67	0.00	24.28	0.60	1.82	0.17	0.00	0.99	1.33	0.57	7.75	0.08	0.00	3.39	0.00	0.00
overflow rate	ft/yr	5.94	10.37	27.29	84.58	4.70	14.70	24565.21	18.51	370.81	83.41	406.64	58631.80	120.63	60.31	414.69	102.73	1987.40	67764.62	215.61	153168.44	102267.05
inflow phos conc	ppb	401.42	407.14	338.04	323.62	257.13	432.37	434.73	416.53	391.04	450.02	441.58	450.02	450.02	450.02	377.73	383.14	323.55	447.16	322.96	450.02	408.46
outflow phos conc	ppb	181.58	229.28	265.77	190.86	193.26	260.44	434.59	244.94	361.09	367.45	427.19	449.96	392.66	390.04	346.17	234.70	319.63	447.10	253.73	450.00	408.43
p reaction rate	-	2.68	1.38	0.35	1.18	0.44	1.10	0.00	1.19	0.09	0.28	0.03	0.00	0.17	0.18	0.10	1.03	0.01	0.00	0.35	0.00	0.00
1-rp	-	0.45	0.56	0.79	0.59	0.75	0.60	1.00	0.59	0.92	0.82	0.97	1.00	0.87	0.87	0.92	0.61	0.99	1.00	0.79	1.00	1.00
vlawmo pond volume	acre-ft	0.40	0.28	0.18	8.81	0.04	0.11	0.18	0.71	2.17	0.61	0.91	0.42	0.61	0.17	1.11	3.07	6.88	0.49	0.58	1.11	0.74
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	372.38	372.96	301.01	390.99	251.61	431.71	437.21	400.49	402.24	450.00	441.15	450.00	450.00	450.00	450.00	439.74	420.17	447.74	348.67	450.00	415.66
runoff coefficient		0.17	0.17	0.12	0.21	0.10	0.24	0.23	0.17	0.18	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.22	0.22	0.18	0.22	0.32
dissolved/total P		0.30	0.30	0.30	0.36	0.30	0.30	0.30	0.39	0.36	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.33	0.30	0.40	0.30	0.30
runoff TSS conc	ppm	169.50	169.28	196.61	155.69	215.39	140.00	140.00	173.46	154.52	140.00	140.77	140.00	140.00	140.00	140.00	142.47	147.87	140.00	172.00	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	2354.62	1637.84	1228.46	47611.49	301.53	573.81	932.01	4217.87	11729.42	3196.16	4788.59	2224.49	3203.70	869.53	5829.11	16189.91	36671.01	2570.99	3292.68	5811.21	3880.01
upstream pond	lbs/yr	0.00	0.00	0.00	36796.84	0.00	932.01	0.00	0.00	8392.56	0.00	0.00	0.00	0.00	0.00	16959.95	20984.77	15582.13	0.00	50200.34	0.00	0.00
total inflow	**lbs/yr**	**2354.62**	**1637.84**	**1228.46**	**84408.33**	**301.53**	**1505.82**	**932.01**	**4217.87**	**20121.98**	**3196.16**	**4788.59**	**2224.49**	**3203.70**	**869.53**	**22789.06**	**37174.68**	**52253.14**	**2570.99**	**53493.02**	**5811.21**	**3880.01**
p removal efficiency (no inf)	%	55.00	44.00	22.00	42.00	25.00	40.00	0.00	42.00	8.00	19.00	4.00	0.00	13.00	14.00	9.00	39.00	2.00	0.00	22.00	0.00	0.00
tss removal efficiency (no inf)	%	91.50	69.33	43.21	68.00	49.11	66.00	0.00	68.00	15.71	37.32	7.86	0.00	25.54	27.50	17.68	65.00	3.93	0.00	43.21	0.00	0.00
net sedimentation	lbs/yr	2154.48	1135.57	530.87	57397.66	148.07	993.84	0.00	2868.15	3162.03	1192.85	376.25	0.00	818.09	239.12	4028.78	24163.54	2052.80	0.00	23116.63	0.00	0.00
outflow	lbs/yr	200.14	502.27	697.59	27010.67	153.46	511.98	932.01	1349.72	16959.95	2003.31	4412.34	2224.49	2385.61	630.41	18760.28	13011.14	50200.34	2570.99	30376.39	5811.21	3880.01
tss removal efficiency (inf)		91.50	69.33	43.21	68.00	49.11	66.00	0.00	68.00	15.71	37.32	7.86	0.00	25.54	27.50	17.68	65.00	3.93	0.00	43.21	0.00	0.00
upstream watershed tss load	lbs/yr	2354.62	1637.84	1228.46	132785.94	301.53	1505.82	932.01	4217.87	25720.82	3196.16	4788.59	2224.49	3203.70	869.53	31549.92	49964.32	89206.33	2570.99	92499.01	5811.21	3880.01
tss total removal efficiency	%	91.50	69.33	43.21	79.66	49.11	66.00	0.00	68.00	34.06	37.32	7.86	0.00	25.54	27.50	40.54	73.96	43.73	0.00	67.16	0.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**5.48**	**3.87**	**2.48**	**336.71**	**0.52**	**3.97**	**2.46**	**9.81**	**66.75**	**8.42**	**12.61**	**5.86**	**8.44**	**2.29**	**82.11**	**130.47**	**232.53**	**6.78**	**240.62**	**15.32**	**10.23**
Adjusted TP outflow	**lbs/yr**	**2.71**	**2.41**	**1.79**	**174.67**	**0.27**	**2.81**	**2.90**	**6.53**	**65.51**	**8.41**	**14.64**	**7.17**	**9.01**	**2.43**	**77.26**	**83.23**	**202.01**	**8.23**	**165.94**	**18.73**	**11.35**
Adjusted TSS outflow	**lbs/yr**	**200.14**	**502.27**	**697.59**	**27010.67**	**153.46**	**511.98**	**932.01**	**1349.72**	**16959.95**	**2003.31**	**4412.34**	**2224.49**	**2385.61**	**630.41**	**18760.28**	**13011.14**	**50200.34**	**2570.99**	**30376.39**	**5811.21**	**3880.01**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		WVR-26	WVR-27	WVR-28	WVR-280	WVR-281	WVR-29	WVR-290	WVR-291	WVR-292	WVR-30	WVR-31	WVR-32	WVR-320	WVR-321	WVR-322	WVR-33	WVR-34	WVR-35	WVR-36	WVR-37	WVR-370
Routed TO:		WVR-28	WVR-28	WVR-443	WVR-28	WVR-280	WVR-33	WVR-29	WVR-29	WVR-LL	WVR-17	WVR-33	WVR-321	WVR-321	WVR-280	WVR-280	WVR-36	WVR-36	WVR-36	WVR-28	WVR-38	WVR-LL
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	170.6	56.2	547.3	161.0	21.1	52.9	8.4	4.7	4.1	16.9	23.7	4.6	5.1	64.6	3.7	63.7	2.6	17.4	186.5	12.3	3.2
Total watershed area (w/o wat	acres	169.6	54.5	547.3	161.0	21.1	51.8	8.4	4.7	4.0	15.9	23.7	4.6	5.1	64.6	3.7	62.7	2.6	17.4	183.7	12.3	3.2
basin area	acres	1.03	1.66	0.00	0.00	0.00	1.15	0.00	0.00	0.10	1.00	0.00	0.00	0.00	0.00	0.00	0.96	0.08	0.00	2.77	0.00	0.00
basin volume	acre-ft	1.96	5.17	0.00	0.00	0.00	2.35	0.00	0.00	0.04	1.87	0.00	0.00	0.00	0.00	0.00	1.74	0.00	0.00	10.05	0.00	0.00
Row Crop Agriculture		0%	47%	1%	6%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		1%	0%	1%	0%	0%	25%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	24%	92%	14%	0%	0%	0%	0%	0%	0%	0%	100%	71%	98%	0%	0%	0%	0%	0%	0%
Low Density Residential		53%	39%	25%	0%	5%	19%	46%	48%	93%	84%	27%	100%	0%	21%	0%	84%	100%	100%	80%	82%	100%
Medium Density Residential		15%	7%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		9%	2%	28%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		3%	0%	5%	0%	0%	0%	0%	0%	0%	2%	56%	0%	0%	0%	0%	15%	0%	0%	4%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		5%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%
Open Space		4%	4%	1%	0%	0%	0%	0%	0%	0%	10%	12%	0%	0%	8%	0%	0%	0%	0%	0%	18%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		10%	0%	9%	0%	1%	56%	54%	52%	7%	3%	0%	0%	0%	0%	2%	1%	0%	0%	4%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	600.34	876.93	3604.32	659.86	21.13	629.79	8.37	4.73	4.03	15.92	23.70	4.65	5.06	74.28	3.69	716.20	2.57	17.42	919.93	12.31	3.21
tributary water area	ac	4.25	55.98	94.16	2.01	0.00	28.11	0.00	0.00	0.10	1.00	0.00	0.00	0.00	0.00	0.00	29.07	0.08	0.00	31.91	0.00	0.00
direct and ponded area	ac	604.60	932.91	3698.48	661.87	21.13	657.90	8.37	4.73	4.13	16.92	23.70	4.65	5.06	74.28	3.69	745.27	2.65	17.42	951.84	12.31	3.21
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	413.40	479.51	296.81	38.43	458.17	397.03	423.00	424.18	446.44	420.71	359.67	450.00	0.01	112.12	6.19	434.36	449.99	450.00	420.52	403.92	450.00
runoff ortho p/total p	-	0.31	0.27	0.23	0.02	0.18	0.35	0.30	0.30	0.30	0.33	0.34	0.30	0.00	0.11	0.00	0.30	0.30	0.30	0.30	0.36	0.30
unit runoff	in/yr	8.54	6.39	8.11	0.54	4.36	7.59	8.58	8.53	7.60	7.04	8.95	7.45	0.00	1.74	0.15	8.10	7.45	7.45	7.20	6.39	7.45
unit export	lbs/ac-y	0.81	0.69	0.70	0.06	0.52	0.69	0.82	0.81	0.77	0.70	0.75	0.76	0.00	0.17	0.01	0.79	0.76	0.76	0.70	0.63	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	120.73	29.03	369.92	7.24	7.67	32.75	5.99	3.36	2.55	9.34	17.66	2.88	0.00	9.35	0.05	42.35	1.59	10.81	110.29	6.56	1.99
upstream pond	ac-ft/yr	266.16	489.72	1737.94	263.52	0.00	346.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.88	0.00	396.48	0.00	0.00	451.23	0.00	0.00
total inflow	**ac-ft/yr**	**386.89**	**518.75**	**2107.85**	**270.76**	**7.67**	**378.81**	**5.99**	**3.36**	**2.55**	**9.34**	**17.66**	**2.88**	**0.00**	**12.24**	**0.05**	**438.83**	**1.59**	**10.81**	**561.53**	**6.56**	**1.99**
outflow	ac-ft/yr	386.89	518.75	2107.85	270.76	7.67	378.81	5.99	3.36	2.55	9.34	17.66	2.88	0.00	12.24	0.05	438.83	1.59	10.81	561.53	6.56	1.99
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	137.75	37.38	384.75	8.90	11.02	35.95	6.83	3.85	3.09	11.11	17.73	3.53	0.00	10.91	0.05	49.24	1.95	13.22	129.05	7.80	2.44
upstream pond	lbs/yr	196.03	256.19	960.95	195.03	0.00	185.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.52	0.00	208.12	0.00	0.00	243.05	0.00	0.00
total inflow	**lbs/yr**	**333.77**	**293.57**	**1345.70**	**203.93**	**11.02**	**221.31**	**6.83**	**3.85**	**3.09**	**11.11**	**17.73**	**3.53**	**0.00**	**14.43**	**0.05**	**257.36**	**1.95**	**13.22**	**372.10**	**7.80**	**2.44**
net sedimentation	lbs/yr	58.45	67.12	0.00	0.01	0.00	30.92	0.00	0.00	0.82	6.04	0.00	0.00	0.00	0.00	0.02	29.48	0.00	0.00	116.84	0.00	0.00
outflow	lbs/yr	275.32	226.46	1345.70	203.93	11.02	190.39	6.83	3.85	2.26	5.07	17.73	3.52	0.00	14.43	0.03	227.87	1.95	13.22	255.25	7.80	2.44
p removal efficiency	%	17.51	22.86	0.00	0.00	0.02	13.97	0.01	0.02	26.72	54.38	0.00	0.03	98.58	0.02	37.65	11.46	0.02	0.01	31.40	0.01	0.04
upstream w-shed p load	lbs/yr	455.76	588.27	2353.22	280.10	11.02	433.15	6.83	3.85	3.09	11.11	17.73	3.53	0.00	14.43	0.05	500.12	1.95	13.22	644.34	7.80	2.44
total removal %	%	39.59	61.50	42.81	27.19	0.02	56.05	0.01	0.02	26.72	54.38	0.00	0.03	98.58	0.03	37.65	54.44	0.02	0.01	60.39	0.01	0.04
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.90	3.11	0.10	0.10	0.10	2.04	0.10	0.10	0.41	1.87	0.10	0.10	0.10	0.10	0.10	1.82	0.00	0.10	3.63	0.10	0.10
relative volume	inches	0.56	6.16	0.00	0.00	0.00	2.49	0.00	0.00	0.56	6.91	0.00	0.00	3.40	0.00	0.01	1.43	0.00	0.00	3.15	0.00	0.00
residence time	years	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.20	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
residence time	days	1.85	3.64	0.00	0.00	0.00	2.27	0.00	0.00	5.92	72.89	0.00	0.00	35.84	0.00	0.08	1.45	0.00	0.00	6.53	0.00	0.00
overflow rate	ft/yr	375.62	312.50	21078547.49	2707635.01	76748.92	329.40	59855.69	33644.11	25.49	9.34	176646.28	28826.13	1.02	122355.52	454.48	457.11	20.71	108096.91	202.94	65584.76	19927.25
inflow phos conc	ppb	317.40	208.21	234.89	277.11	528.29	214.94	419.98	421.13	445.56	437.54	369.22	450.02	385.36	433.98	399.99	215.77	450.02	450.02	243.80	437.55	450.02
outflow phos conc	ppb	261.82	160.61	234.89	277.10	528.18	184.92	419.93	421.03	326.50	199.59	369.21	449.89	5.47	433.90	249.39	191.05	449.94	449.99	167.24	437.50	449.83
p reaction rate	-	0.26	0.38	0.00	0.00	0.00	0.19	0.00	0.00	0.50	2.61	0.00	0.00	4890.17	0.00	0.97	0.15	0.00	0.00	0.67	0.00	0.00
1-rp	-	0.82	0.77	1.00	1.00	1.00	0.86	1.00	1.00	0.73	0.46	1.00	1.00	0.01	1.00	0.62	0.89	1.00	1.00	0.69	1.00	1.00
vlawmo pond volume	acre-ft	8.72	2.10	26.71	0.52	0.55	2.36	0.43	0.24	0.18	0.67	1.28	0.21	0.00	0.68	0.00	3.06	0.12	0.78	7.96	0.47	0.14
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	413.40	479.51	296.81	38.43	458.17	397.03	423.00	424.18	446.44	420.71	359.67	450.00	0.01	112.12	6.19	434.36	449.99	450.00	420.52	403.92	450.00
runoff coefficient		0.25	0.18	0.23	0.02	0.13	0.22	0.25	0.25	0.22	0.20	0.26	0.22	0.00	0.05	0.00	0.23	0.22	0.22	0.21	0.18	0.22
dissolved/total P		0.31	0.27	0.23	0.02	0.18	0.35	0.30	0.30	0.30	0.33	0.34	0.30	0.00	0.11	0.00	0.30	0.30	0.30	0.30	0.36	0.30
runoff TSS conc	ppm	147.18	154.05	110.14	12.33	138.75	158.81	140.00	140.00	140.00	147.65	152.54	140.00	0.00	47.16	2.17	140.00	140.00	140.00	148.90	154.01	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	46522.60	11730.91	141550.11	2993.45	3335.55	13137.16	2270.93	1276.46	966.93	3592.30	6848.10	1093.67	0.04	3704.56	17.25	16068.82	604.89	4101.20	43027.80	2555.70	756.04
upstream pond	lbs/yr	40067.62	46419.03	184859.58	56886.87	0.00	30558.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1093.67	0.00	38527.12	0.00	0.00	46432.99	0.00	0.00
total inflow	**lbs/yr**	**86590.22**	**58149.94**	**326409.69**	**59880.33**	**3335.55**	**43695.21**	**2270.93**	**1276.46**	**966.93**	**3592.30**	**6848.10**	**1093.67**	**0.04**	**4798.22**	**17.25**	**54595.95**	**604.89**	**4101.20**	**89460.79**	**2555.70**	**756.04**
p removal efficiency (no inf)	%	18.00	23.00	0.00	0.00	0.00	14.00	0.00	0.00	27.00	55.00	0.00	0.00	99.00	0.00	38.00	12.00	0.00	0.00	32.00	0.00	0.00
tss removal efficiency (no inf)	%	35.36	45.18	0.00	0.00	0.00	27.50	0.00	0.00	53.04	91.50	0.00	0.00	93.00	0.00	64.00	23.57	0.00	0.00	58.50	0.00	0.00
net sedimentation	lbs/yr	30615.83	26271.31	0.00	0.00	0.00	12016.18	0.00	0.00	512.82	3286.96	0.00	0.00	0.04	0.00	11.04	12869.04	0.00	0.00	52334.56	0.00	0.00
outflow	lbs/yr	55974.39	31878.63	326409.69	59880.33	3335.55	31679.03	2270.93	1276.46	454.11	305.35	6848.10	1093.67	0.00	4798.22	6.21	41726.90	604.89	4101.20	37126.23	2555.70	756.04
tss removal efficiency (inf)		35.36	45.18	0.00	0.00	0.00	27.50	0.00	0.00	53.04	91.50	0.00	0.00	93.00	0.00	64.00	23.57	0.00	0.00	58.50	0.00	0.00
upstream watershed tss load	lbs/yr	148712.83	204455.68	824123.24	109283.32	3335.55	149470.49	2270.93	1276.46	966.93	3592.30	6848.10	1093.67	0.04	4798.26	17.25	172387.41	604.89	4101.20	220121.30	2555.70	756.04
tss total removal efficiency	%	62.36	84.41	60.39	45.21	0.00	78.81	0.00	0.00	53.04	91.50	0.00	0.00	93.00	0.00	64.00	75.79	0.00	0.00	83.13	0.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**386.89**	**518.75**	**2107.85**	**270.76**	**7.67**	**378.81**	**5.99**	**3.36**	**2.55**	**9.34**	**17.66**	**2.88**	**0.00**	**12.24**	**0.05**	**438.83**	**1.59**	**10.81**	**561.53**	**6.56**	**1.99**
Adjusted TP outflow	**lbs/yr**	**275.32**	**226.46**	**1345.70**	**203.93**	**11.02**	**190.39**	**6.83**	**3.85**	**2.26**	**5.07**	**17.73**	**3.52**	**0.00**	**14.43**	**0.03**	**227.87**	**1.95**	**13.22**	**255.25**	**7.80**	**2.44**
Adjusted TSS outflow	**lbs/yr**	**55974.39**	**31878.63**	**326409.69**	**59880.33**	**3335.55**	**31679.03**	**2270.93**	**1276.46**	**454.11**	**305.35**	**6848.10**	**1093.67**	**0.00**	**4798.22**	**6.21**	**41726.90**	**604.89**	**4101.20**	**37126.23**	**2555.70**	**756.04**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		WVR-38	WVR-40	WVR-41	WVR-42	WVR-4333	WVR-4334	WVR-4335	WVR-4336	WVR-4337	WVR-4338	WVR-44	WVR-440	WVR-441	WVR-4410	WVR-4411	WVR-442	WVR-4420	WVR-4421	WVR-4422	WVR-4423	WVR-443
Routed TO:		WVR-19	WVR-41	WVR-27	WVR-27	WVR-443	WVR-4333	WVR-4333	WVR-4335	WVR-4335	WVR-443	WVR-443	WVR-4410	WVR-443	WVR-441	WVR-441	WVR-443	WVR-442	WVR-442	WVR-442	WVR-4422	Lakeville
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	28.6	277.5	70.1	68.4	12.7	9.0	8.4	6.1	20.5	22.9	92.4	14.6	24.8	5.4	20.2	50.1	17.1	52.6	11.5	16.0	163.5
Total watershed area (w/o wat	acres	28.3	273.8	69.2	67.7	11.7	9.0	8.4	6.1	20.2	22.9	92.4	14.6	24.8	5.4	20.2	50.1	17.1	52.6	11.5	16.0	163.5
basin area	acres	0.31	3.67	0.94	0.70	1.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
basin volume	acre-ft	0.27	12.82	2.03	1.03	1.87	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	4%	91%	92%	100%	100%	100%	89%	51%	55%	100%	100%	100%	100%	92%	95%	100%	100%	76%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	11%	0%	0%	0%	0%	8%	5%	0%	0%	3%
Pits and Quarries		0%	0%	0%	0%	0%	6%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		100%	61%	69%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Medium Density Residential		0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	28%	31%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	4%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	3%	0%	6%	9%	1%	0%	0%	0%	1%	16%	33%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	2%	0%	13%	0%	0%	0%	0%	0%	0%	11%	1%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	40.58	685.54	754.72	67.70	55.37	9.00	34.67	6.06	20.19	22.90	92.36	14.63	65.08	20.08	20.24	147.36	17.10	52.63	27.48	16.02	5163.41
tributary water area	ac	0.31	52.68	53.62	0.70	1.36	0.00	0.36	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.10
direct and ponded area	ac	40.89	738.22	808.35	68.40	56.73	9.00	35.03	6.06	20.55	22.90	92.36	14.63	65.08	20.08	20.24	147.36	17.10	52.63	27.48	16.02	5262.51
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	449.42	407.47	418.82	391.82	510.56	500.84	540.00	540.00	540.00	480.30	428.47	405.76	540.00	539.99	540.00	539.39	525.71	530.03	540.00	540.00	485.83
runoff ortho p/total p	-	0.30	0.31	0.30	0.31	0.23	0.19	0.20	0.20	0.20	0.18	0.31	0.37	0.20	0.20	0.20	0.20	0.22	0.22	0.20	0.20	0.26
unit runoff	in/yr	7.43	8.60	8.76	7.64	4.58	4.49	4.85	4.85	4.85	4.31	6.27	3.67	4.85	4.85	4.85	4.87	4.73	4.77	4.85	4.85	5.07
unit export	lbs/ac-y	0.76	0.79	0.81	0.70	0.55	0.55	0.59	0.59	0.59	0.53	0.61	0.39	0.59	0.59	0.59	0.59	0.57	0.58	0.59	0.59	0.57
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	17.51	196.12	50.49	43.12	4.46	3.37	3.40	2.45	8.15	8.22	48.26	4.47	10.00	2.20	8.18	20.34	6.73	20.91	4.63	6.47	69.09
upstream pond	ac-ft/yr	6.56	199.98	396.10	0.00	17.38	0.00	10.60	0.00	0.00	0.00	0.00	0.00	14.85	4.47	0.00	38.74	0.00	0.00	6.47	0.00	2810.60
total inflow	**ac-ft/yr**	**24.07**	**396.10**	**446.60**	**43.12**	**21.84**	**3.37**	**14.00**	**2.45**	**8.15**	**8.22**	**48.26**	**4.47**	**24.85**	**6.67**	**8.18**	**59.08**	**6.73**	**20.91**	**11.10**	**6.47**	**2879.70**
outflow	ac-ft/yr	24.07	396.10	446.60	43.12	21.84	3.37	14.00	2.45	8.15	8.22	48.26	4.47	24.85	6.67	8.18	59.08	6.73	20.91	11.10	6.47	2879.70
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	21.42	217.16	56.07	47.39	6.42	4.93	4.99	3.59	11.97	12.05	55.99	5.67	14.68	3.23	12.00	29.79	9.70	30.29	6.80	9.50	92.80
upstream pond	lbs/yr	7.80	148.81	203.90	0.00	19.33	0.00	9.40	0.00	0.00	0.00	0.00	0.00	20.90	5.67	0.00	56.28	0.00	0.00	9.49	0.00	2097.60
total inflow	**lbs/yr**	**29.22**	**365.97**	**259.97**	**47.39**	**25.74**	**4.93**	**14.40**	**3.59**	**11.97**	**12.05**	**55.99**	**5.67**	**35.58**	**8.90**	**12.00**	**86.07**	**9.70**	**30.29**	**16.29**	**9.50**	**2190.40**
net sedimentation	lbs/yr	8.63	162.07	32.98	18.18	14.50	0.00	0.00	0.00	6.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	20.59	203.90	226.98	29.21	11.24	4.93	14.40	3.59	5.81	12.05	55.99	5.67	35.57	8.90	12.00	86.07	9.70	30.29	16.29	9.49	2190.40
p removal efficiency	%	29.52	44.28	12.69	38.37	56.34	0.05	0.01	0.06	51.44	0.02	0.00	0.02	0.01	0.02	0.02	0.00	0.02	0.01	0.01	0.02	0.00
upstream w-shed p load	lbs/yr	29.22	447.43	503.49	47.39	31.90	4.93	20.56	3.59	11.97	12.05	55.99	5.67	35.58	8.90	12.00	86.08	9.70	30.29	16.29	9.50	3308.02
total removal %	%	29.53	54.43	54.92	38.37	64.77	0.05	29.97	0.06	51.44	0.02	0.00	0.02	0.02	0.03	0.02	0.01	0.02	0.01	0.03	0.02	33.79
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.87	3.49	2.16	1.47	1.87	0.10	0.10	0.10	0.96	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
relative volume	inches	0.53	2.26	1.39	0.82	14.47	0.00	0.00	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
residence time	years	0.01	0.03	0.00	0.02	0.09	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
residence time	days	4.07	11.81	1.66	8.69	31.18	0.00	0.00	0.00	15.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
overflow rate	ft/yr	77.66	107.93	475.10	61.87	21.84	33720.84	140043.14	24477.32	22.65	82245.10	482556.87	44746.76	248501.09	66748.17	81766.49	590799.50	67337.95	209057.03	110997.72	64697.68	28796957.63
inflow phos conc	ppb	446.51	339.92	214.17	404.34	433.69	538.25	378.23	540.02	540.03	538.98	426.89	466.45	526.70	490.65	540.03	536.00	530.22	533.11	539.95	540.03	279.85
outflow phos conc	ppb	314.68	189.39	186.99	249.20	189.34	538.00	378.21	539.69	262.24	538.87	426.89	466.38	526.67	490.55	539.93	535.98	530.11	533.08	539.88	539.90	279.85
p reaction rate	-	0.59	1.43	0.17	1.01	2.96	0.00	0.00	0.00	2.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-rp	-	0.70	0.56	0.87	0.62	0.44	1.00	1.00	1.00	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
vlawmo pond volume	acre-ft	1.26	14.16	3.65	3.11	0.32	0.24	0.25	0.18	0.59	0.59	3.48	0.32	0.72	0.16	0.59	1.47	0.49	1.51	0.33	0.47	4.99
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	449.42	407.47	418.82	391.82	510.56	500.84	540.00	540.00	540.00	480.30	428.47	405.76	540.00	539.99	540.00	539.39	525.71	530.03	540.00	540.00	485.83
runoff coefficient		0.21	0.25	0.25	0.22	0.13	0.13	0.14	0.14	0.14	0.12	0.18	0.11	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.15
dissolved/total P		0.30	0.31	0.30	0.31	0.23	0.19	0.20	0.20	0.20	0.18	0.31	0.37	0.20	0.20	0.20	0.20	0.22	0.22	0.20	0.20	0.26
runoff TSS conc	ppm	140.17	144.82	140.00	155.80	167.44	153.29	163.00	163.00	163.00	146.17	168.77	186.12	163.00	163.00	163.00	162.90	166.99	165.74	163.00	163.00	166.69
POND TSS BUDGETS.....																						
runoff	lbs/yr	6647.10	75197.32	19156.21	17067.53	1991.90	1492.07	1503.18	1081.23	3601.70	3636.64	20264.42	2133.12	4416.70	971.86	3611.87	8974.27	3024.45	9339.03	2045.21	2857.89	30038.87
upstream pond	lbs/yr	2555.70	41999.19	35158.95	0.00	4616.75	0.00	1621.49	0.00	0.00	0.00	0.00	0.00	6716.85	2133.12	0.00	17266.57	0.00	0.00	2857.89	0.00	560078.69
total inflow	**lbs/yr**	**9202.80**	**117196.51**	**54315.16**	**17067.53**	**6608.65**	**1492.07**	**3124.67**	**1081.23**	**3601.70**	**3636.64**	**20264.42**	**2133.12**	**11133.55**	**3104.98**	**3611.87**	**26240.84**	**3024.45**	**9339.03**	**4903.10**	**2857.89**	**590117.56**
p removal efficiency (no inf)	%	30.00	45.00	13.00	39.00	57.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	56.75	70.00	25.54	65.00	93.00	0.00	0.00	0.00	85.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
net sedimentation	lbs/yr	5222.59	82037.56	13869.77	11093.89	6146.04	0.00	0.00	0.00	3061.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	3980.21	35158.95	40445.40	5973.63	462.61	1492.07	3124.67	1081.23	540.25	3636.64	20264.42	2133.12	11133.55	3104.98	3611.87	26240.84	3024.45	9339.03	4903.10	2857.89	590117.56
tss removal efficiency (inf)		56.75	70.00	25.54	65.00	93.00	0.00	0.00	0.00	85.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream watershed tss load	lbs/yr	9202.80	156501.03	175657.24	17067.53	9670.09	1492.07	6186.12	1081.23	3601.70	3636.64	20264.42	2133.12	11133.55	3104.98	3611.87	26240.84	3024.45	9339.03	4903.10	2857.89	1143739.04
tss total removal efficiency	%	56.75	77.53	76.97	65.00	95.22	0.00	49.49	0.00	85.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.40
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**24.07**	**396.10**	**446.60**	**43.12**	**21.84**	**3.37**	**14.00**	**2.45**	**8.15**	**8.22**	**48.26**	**4.47**	**24.85**	**6.67**	**8.18**	**59.08**	**6.73**	**20.91**	**11.10**	**6.47**	**2879.70**
Adjusted TP outflow	**lbs/yr**	**20.59**	**203.90**	**226.98**	**29.21**	**11.24**	**4.93**	**14.40**	**3.59**	**5.81**	**12.05**	**55.99**	**5.67**	**35.57**	**8.90**	**12.00**	**86.07**	**9.70**	**30.29**	**16.29**	**9.49**	**2190.40**
Adjusted TSS outflow	**lbs/yr**	**3980.21**	**35158.95**	**40445.40**	**5973.63**	**462.61**	**1492.07**	**3124.67**	**1081.23**	**540.25**	**3636.64**	**20264.42**	**2133.12**	**11133.55**	**3104.98**	**3611.87**	**26240.84**	**3024.45**	**9339.03**	**4903.10**	**2857.89**	**590117.56**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		WVR-4430	WVR-4431	WVR-4432	WVR-45	WVR-46	WVR-47	WVR-48	WVR-49	WVR-50	WVR-52	WVR-53	WVR-54	WVR-55	WVR-56	WVR-560	WVR-57	WVR-58	WVR-59	WVR-590	WVR-60	exit 1
Routed TO:		WVR-443	WVR-443	WVR-443	WVR-443	WVR-50	WVR-50	WVR-50	WVR-47	WVR-443	WVR-53	WVR-54	WVR-443	WVR-56	WVR-280	WVR-56	WVR-56	WVR-17	WVR-17	WVR-59	WVR-1	Lakeville
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area	acres	26.7	3.4	1.3	211.2	56.7	97.4	14.1	30.2	117.3	136.0	141.7	106.3	130.1	171.5	80.3	19.8	4.3	15.3	22.1	3.4	4.2
Total watershed area (w/o wat	acres	26.7	3.4	1.3	211.2	54.9	97.4	14.1	30.0	117.3	136.0	141.7	106.3	129.1	171.5	79.3	19.8	4.3	10.9	18.1	3.0	4.2
basin area	acres	0.00	0.00	0.00	0.00	1.81	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.99	0.00	1.02	0.00	0.00	4.31	4.00	0.36	0.00
basin volume	acre-ft	0.00	0.00	0.00	0.00	9.58	0.00	0.00	0.20	0.00	0.00	0.00	0.00	3.97	0.00	1.94	0.00	0.00	12.93	8.00	0.35	0.00
Row Crop Agriculture		59%	100%	100%	48%	0%	0%	0%	0%	35%	29%	88%	72%	18%	32%	0%	0%	0%	0%	0%	0%	0%
Farmstead		26%	0%	0%	0%	0%	0%	0%	0%	0%	8%	2%	1%	0%	4%	1%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	9%	0%	0%	0%	0%	0%	59%	5%	1%	3%	48%	4%	3%	0%	0%	0%	0%	0%
Low Density Residential		0%	0%	0%	3%	5%	38%	0%	90%	46%	0%	0%	0%	0%	0%	16%	0%	0%	47%	13%	100%	0%
Medium Density Residential		0%	0%	0%	0%	46%	42%	12%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	35%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	62%	5%	0%	96%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	51%	0%	0%	0%	0%	0%	0%
Open Space		12%	0%	0%	0%	9%	20%	88%	9%	2%	2%	0%	24%	13%	11%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		4%	0%	0%	5%	10%	0%	0%	2%	15%	2%	5%	1%	4%	0%	0%	0%	0%	0%	0%	0%	100%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	53%	87%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	26.71	3.42	1.33	211.18	127.13	127.35	14.11	29.95	385.93	136.00	277.66	383.96	129.15	399.79	79.28	19.83	4.31	29.01	18.07	3.00	4.23
tributary water area	ac	0.00	0.00	0.00	0.00	3.32	0.26	0.00	0.26	3.58	0.00	0.00	0.00	0.99	2.01	1.02	0.00	0.00	8.31	4.00	0.36	0.00
direct and ponded area	ac	26.71	3.42	1.33	211.18	130.45	127.61	14.11	30.21	389.51	136.00	277.66	383.96	130.14	401.80	80.30	19.83	4.31	37.32	22.07	3.36	4.23
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	446.31	539.99	539.98	414.49	393.31	399.77	230.38	427.14	467.21	195.49	501.81	444.98	356.90	224.99	301.22	339.83	250.00	344.73	276.43	450.00	400.00
runoff ortho p/total p	-	0.33	0.20	0.20	0.23	0.33	0.36	0.56	0.33	0.27	0.12	0.20	0.30	0.31	0.16	0.29	0.29	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	4.24	4.85	4.85	8.23	9.90	7.63	2.81	6.98	6.77	1.87	4.83	4.04	12.61	2.75	6.05	17.32	4.29	5.79	4.71	7.45	9.55
unit export	lbs/ac-y	0.46	0.59	0.59	0.76	0.91	0.76	0.20	0.70	0.70	0.21	0.57	0.46	1.03	0.28	0.47	1.37	0.24	0.49	0.31	0.76	0.87
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	9.45	1.38	0.54	144.86	45.29	61.96	3.30	17.41	66.19	21.23	56.97	35.79	135.68	39.29	39.97	28.63	1.54	5.28	7.09	1.86	3.37
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	76.11	17.41	0.00	0.00	204.08	0.00	21.23	78.21	0.00	204.28	0.00	0.00	0.00	7.09	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**9.45**	**1.38**	**0.54**	**144.86**	**121.40**	**79.38**	**3.30**	**17.41**	**270.27**	**21.23**	**78.21**	**114.00**	**135.68**	**243.57**	**39.97**	**28.63**	**1.54**	**12.37**	**7.09**	**1.86**	**3.37**
outflow	ac-ft/yr	9.45	1.38	0.54	144.86	121.40	79.38	3.30	17.41	270.27	21.23	78.21	114.00	135.68	243.57	39.97	28.63	1.54	12.37	7.09	1.86	3.37
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	12.19	2.03	0.79	161.04	49.92	73.85	2.83	20.99	82.68	28.55	80.99	48.53	133.51	47.68	37.26	27.25	1.05	5.33	5.63	2.28	3.66
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	37.18	15.16	0.00	0.00	134.20	0.00	28.54	109.53	0.00	121.88	0.00	0.00	0.00	2.64	0.00	0.00	0.00
total inflow	**lbs/yr**	**12.19**	**2.03**	**0.79**	**161.04**	**87.11**	**89.01**	**2.83**	**20.99**	**216.88**	**28.55**	**109.53**	**158.06**	**133.51**	**169.56**	**37.26**	**27.25**	**1.05**	**7.98**	**5.63**	**2.28**	**3.66**
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	44.74	0.00	0.00	5.82	0.00	0.00	0.00	0.00	59.26	0.00	16.88	0.00	0.00	4.45	2.98	1.07	0.00
outflow	lbs/yr	12.19	2.02	0.79	161.04	42.36	89.01	2.82	15.16	216.88	28.54	109.53	158.06	74.25	169.55	20.38	27.25	1.05	3.53	2.64	1.21	3.66
p removal efficiency	%	0.01	0.11	0.28	0.00	51.37	0.00	0.01	27.75	0.00	0.01	0.00	0.00	44.39	0.00	45.31	0.00	0.03	55.81	53.00	46.79	0.02
upstream w-shed p load	lbs/yr	12.19	2.03	0.79	161.04	125.94	94.84	2.83	20.99	306.29	28.55	109.53	158.07	133.51	245.70	37.26	27.25	1.05	10.96	5.63	2.28	3.66
total removal %	%	0.01	0.11	0.28	0.00	66.36	6.14	0.01	27.75	29.19	0.01	0.00	0.00	44.39	30.99	45.31	0.00	0.03	67.83	53.00	46.79	0.02
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.10	0.10	0.10	0.10	5.30	0.10	0.10	0.77	0.10	0.10	0.10	0.10	4.02	0.10	1.89	0.10	0.10	3.00	2.00	0.96	0.10
relative volume	inches	0.00	0.00	0.00	0.00	7.32	0.00	0.00	0.40	0.00	0.00	0.00	0.00	1.01	0.00	1.68	0.00	0.00	84.85	39.04	6.46	0.00
residence time	years	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.05	0.00	0.00	1.05	1.13	0.19	0.00
residence time	days	0.00	0.00	0.01	0.00	28.81	0.00	0.00	4.21	0.00	0.00	0.00	0.00	10.67	0.00	17.72	0.00	0.00	381.56	411.58	68.10	0.00
overflow rate	ft/yr	94462.81	13806.28	5368.81	1448635.28	67.15	793753.58	33034.09	66.97	2702730.21	212333.58	782061.18	1139990.23	137.46	2435656.25	39.04	286264.09	15418.64	2.87	1.77	5.14	33682.20
inflow phos conc	ppb	474.93	540.02	540.00	409.00	263.98	412.59	314.66	443.44	295.24	494.62	515.28	510.12	362.04	256.12	342.92	350.28	250.02	237.27	291.79	450.02	400.02
outflow phos conc	ppb	474.89	539.43	538.50	409.00	128.39	412.58	314.63	320.41	295.24	494.56	515.27	510.11	201.35	256.12	187.54	350.27	249.95	104.85	137.14	239.44	399.93
p reaction rate	-	0.00	0.00	0.00	0.00	2.17	0.00	0.00	0.53	0.00	0.00	0.00	0.00	1.44	0.00	1.51	0.00	0.00	2.86	2.40	1.65	0.00
1-rp	-	1.00	1.00	1.00	1.00	0.49	1.00	1.00	0.72	1.00	1.00	1.00	1.00	0.56	1.00	0.55	1.00	1.00	0.44	0.47	0.53	1.00
vlawmo pond volume	acre-ft	0.68	0.10	0.04	10.46	3.27	4.47	0.24	1.26	4.78	1.53	4.11	2.58	9.80	2.84	2.89	2.07	0.11	0.38	0.51	0.13	0.24
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	446.31	539.99	539.98	414.49	393.31	399.77	230.38	427.14	467.21	195.49	501.81	444.98	356.90	224.99	301.22	339.83	250.00	344.73	276.43	450.00	400.00
runoff coefficient		0.12	0.14	0.14	0.24	0.29	0.22	0.08	0.20	0.20	0.05	0.14	0.12	0.36	0.08	0.17	0.50	0.12	0.17	0.14	0.22	0.28
dissolved/total P		0.33	0.20	0.20	0.23	0.33	0.36	0.56	0.33	0.27	0.12	0.20	0.30	0.31	0.16	0.29	0.29	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	181.96	163.00	163.00	138.30	146.71	155.23	206.76	146.70	149.81	71.19	154.37	174.11	150.37	90.96	174.41	135.67	216.00	180.00	205.96	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	4454.80	609.86	237.15	57488.08	17331.78	24088.44	1621.69	6685.01	26221.09	9715.27	24879.58	16355.76	52564.34	17215.49	17495.67	10863.30	902.53	2426.56	3847.72	706.36	1277.91
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	4341.43	3008.25	0.00	0.00	31969.36	0.00	9715.27	34594.85	0.00	31531.39	0.00	0.00	0.00	384.77	0.00	0.00	0.00
total inflow	**lbs/yr**	**4454.80**	**609.86**	**237.15**	**57488.08**	**21673.21**	**27096.69**	**1621.69**	**6685.01**	**58190.44**	**9715.27**	**34594.85**	**50950.61**	**52564.34**	**48746.89**	**17495.67**	**10863.30**	**902.53**	**2811.33**	**3847.72**	**706.36**	**1277.91**
p removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	52.00	0.00	0.00	28.00	0.00	0.00	0.00	0.00	45.00	0.00	46.00	0.00	0.00	56.00	54.00	47.00	0.00
tss removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	85.00	0.00	0.00	55.00	0.00	0.00	0.00	0.00	70.00	0.00	72.00	0.00	0.00	93.00	90.00	74.00	0.00
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	18422.23	0.00	0.00	3676.75	0.00	0.00	0.00	0.00	36795.04	0.00	12596.88	0.00	0.00	2614.54	3462.95	522.71	0.00
outflow	lbs/yr	4454.80	609.86	237.15	57488.08	3250.98	27096.69	1621.69	3008.25	58190.44	9715.27	34594.85	50950.61	15769.30	48746.89	4898.79	10863.30	902.53	196.79	384.77	183.65	1277.91
tss removal efficiency (inf)		0.00	0.00	0.00	0.00	85.00	0.00	0.00	55.00	0.00	0.00	0.00	0.00	70.00	0.00	72.00	0.00	0.00	93.00	90.00	74.00	0.00
upstream watershed tss load	lbs/yr	4454.80	609.86	237.15	57488.08	46274.67	30773.44	1621.69	6685.01	104890.88	9715.27	34594.85	50950.61	52564.34	98138.80	17495.67	10863.30	902.53	6274.28	3847.72	706.36	1277.91
tss total removal efficiency	%	0.00	0.00	0.00	0.00	92.97	11.95	0.00	55.00	44.52	0.00	0.00	0.00	70.00	50.33	72.00	0.00	0.00	96.86	90.00	74.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**9.45**	**1.38**	**0.54**	**144.86**	**121.40**	**79.38**	**3.30**	**17.41**	**270.27**	**21.23**	**78.21**	**114.00**	**135.68**	**243.57**	**39.97**	**28.63**	**1.54**	**12.37**	**7.09**	**1.86**	**3.37**
Adjusted TP outflow	**lbs/yr**	**12.19**	**2.02**	**0.79**	**161.04**	**42.36**	**89.01**	**2.82**	**15.16**	**216.88**	**28.54**	**109.53**	**158.06**	**74.25**	**169.55**	**20.38**	**27.25**	**1.05**	**3.53**	**2.64**	**1.21**	**3.66**
Adjusted TSS outflow	**lbs/yr**	**4454.80**	**609.86**	**237.15**	**57488.08**	**3250.98**	**27096.69**	**1621.69**	**3008.25**	**58190.44**	**9715.27**	**34594.85**	**50950.61**	**15769.30**	**48746.89**	**4898.79**	**10863.30**	**902.53**	**196.79**	**384.77**	**183.65**	**1277.91**

Apple Valley Loading Assessment
68-07360
Baseline (1990) TP LOADS

		exit 2	exit 3a	exit 3b	exit 4	exit 5	exit 6	exit 7	AL-LL	BD-LL	EVR-LL	WVR-LL	Lakeville	Burnsville	Rosemount	Eagan
Routed TO:		Burnsville	Burnsville	exit 4	Eagan	Eagan	Eagan	Rosemount	AL-9	Burnsville	Lakeville	Lakeville				
INPUT VARIABLES....	UNITS															
case label	-															
Total watershed area	acres	3.6	9.0	9.4	23.1	0.7	884.6	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total watershed area (w/o wat	acres	3.6	9.0	9.4	23.1	0.7	884.6	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
basin area	acres	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
basin volume	acre-ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	0%	32%	17%	100%	6%	12%	0%	0%	0%	0%	0%	0%	0%	0%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	24%	0%	0%	28%	58%	100%	100%	100%	100%	100%	100%	100%	100%
Golf Course		0%	0%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		100%	100%	44%	83%	0%	1%	30%	0%	0%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	46%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING…….																
tributary land area	ac	3.57	9.00	9.44	32.51	0.73	884.56	13.92	16.29	46.91	89.37	103.42	8587.75	1261.04	64.22	917.80
tributary water area	ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	2.24	5.81	3.54	276.97	74.84	4.84	0.00
direct and ponded area	ac	3.57	9.00	9.44	32.51	0.73	884.56	13.92	16.86	49.16	95.18	106.96	8864.73	1335.88	69.06	917.80
ASSUMED EXPORT FACTORS.....																
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	400.00	400.00	368.29	408.53	449.98	304.21	289.13	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
runoff ortho p/total p	-	0.30	0.30	0.37	0.30	0.30	0.46	0.48	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
unit runoff	in/yr	9.55	9.55	7.01	9.19	7.45	3.66	4.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
unit export	lbs/ac-y	0.87	0.87	0.64	0.85	0.76	0.27	0.39	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
POND WATER BUDGETS.....																
runoff	ac-ft/yr	2.84	7.16	5.52	17.66	0.45	270.08	5.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream pond	ac-ft/yr	0.00	0.00	0.00	5.52	0.00	0.00	0.00	8.05	30.49	41.22	55.72	4614.33	788.29	33.08	293.71
total inflow	**ac-ft/yr**	**2.84**	**7.16**	**5.52**	**23.18**	**0.45**	**270.08**	**5.48**	**8.05**	**30.49**	**41.22**	**55.72**	**4614.33**	**788.29**	**33.08**	**293.71**
outflow	ac-ft/yr	2.84	7.16	5.52	23.18	0.45	270.08	5.48	8.05	30.49	41.22	55.72	4614.33	788.29	33.08	293.71
POND PHOSPHORUS BUDGETS.....																
runoff	lbs/yr	3.09	7.79	6.08	19.53	0.55	235.89	5.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream pond	lbs/yr	0.00	0.00	0.00	6.08	0.00	0.00	0.00	6.84	22.59	29.25	41.94	3373.31	629.23	12.48	262.05
total inflow	**lbs/yr**	**3.09**	**7.79**	**6.08**	**25.61**	**0.55**	**235.89**	**5.46**	**6.84**	**22.59**	**29.25**	**41.94**	**3373.31**	**629.23**	**12.48**	**262.05**
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	3.09	7.79	6.08	25.61	0.55	235.89	5.46	6.84	22.59	29.25	41.94	3373.31	629.23	12.48	262.05
p removal efficiency	%	0.03	0.01	0.01	0.00	0.18	0.00	0.01	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00
upstream w-shed p load	lbs/yr	3.09	7.79	6.08	25.61	0.55	235.89	5.46	10.27	36.30	46.39	63.81	5367.16	927.58	38.25	262.05
total removal %	%	0.03	0.01	0.01	0.01	0.18	0.00	0.01	33.38	37.76	36.95	34.27	37.15	32.16	67.38	0.00
HYDRAULIC PARAMETERS.....																
pond mean depth	feet	0.10	0.10	0.10	0.10	0.10	0.10	0.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
relative volume	inches	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00	240.00	240.00	240.00	240.00	240.00	240.00	240.00
residence time	years	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
residence time	days	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
overflow rate	ft/yr	28422.74	71612.41	55177.99	231780.44	4537.28	2700781.16	54831.14	80475.80	304869.90	412236.48	557225.83	46143272.00	7882914.04	330754.00	2937099.02
inflow phos conc	ppb	400.02	400.02	405.21	406.54	450.01	321.34	366.68	312.84	272.65	261.10	276.92	268.97	293.68	138.82	328.26
outflow phos conc	ppb	399.92	399.98	405.16	406.52	449.19	321.34	366.65	312.73	272.63	261.08	276.90	268.97	293.68	138.82	328.26
p reaction rate	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-rp	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
vlawmo pond volume	acre-ft	0.21	0.52	0.40	1.28	0.03	19.50	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LAND USE PARAMETERS.....																
runoff total P conc	ppb	400.00	400.00	368.29	408.53	449.98	304.21	289.13	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
runoff coefficient		0.28	0.28	0.20	0.27	0.22	0.11	0.14	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
dissolved/total P		0.30	0.30	0.37	0.30	0.30	0.46	0.48	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
runoff TSS conc	ppm	140.00	140.00	158.11	140.02	140.00	210.23	184.42	216.00	216.00	216.00	216.00	216.00	216.00	216.00	216.00
POND TSS BUDGETS.....																
runoff	lbs/yr	1078.36	2716.98	2160.30	6700.45	172.15	148972.71	2322.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
upstream pond	lbs/yr	0.00	0.00	0.00	2160.30	0.00	0.00	0.00	1340.59	4548.53	7352.23	8660.25	864762.77	155368.24	2889.52	158005.61
total inflow	**lbs/yr**	**1078.36**	**2716.98**	**2160.30**	**8860.75**	**172.15**	**148972.71**	**2322.01**	**1340.59**	**4548.54**	**7352.23**	**8660.26**	**864762.78**	**155368.25**	**2889.53**	**158005.62**
p removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	1078.36	2716.98	2160.30	8860.75	172.15	148972.71	2322.01	1340.59	4548.54	7352.23	8660.26	864762.78	155368.25	2889.53	158005.62
tss removal efficiency (inf)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream watershed tss load	lbs/yr	1078.36	2716.98	2160.30	8860.75	172.15	148972.71	2322.01	3384.09	11610.58	17204.13	22774.48	1840733.38	303273.64	13032.88	158005.62
tss total removal efficiency	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.39	60.82	57.26	61.97	53.02	48.77	77.83	0.00
INFILTRATION BMP/POND……																
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**2.84**	**7.16**	**5.52**	**23.18**	**0.45**	**270.08**	**5.48**	**8.05**	**30.49**	**41.22**	**55.72**	**4614.33**	**788.29**	**33.08**	**293.71**
Adjusted TP outflow	**lbs/yr**	**3.09**	**7.79**	**6.08**	**25.61**	**0.55**	**235.89**	**5.46**	**6.84**	**22.59**	**29.25**	**41.94**	**3373.31**	**629.23**	**12.48**	**262.05**
Adjusted TSS outflow	**lbs/yr**	**1078.36**	**2716.98**	**2160.30**	**8860.75**	**172.15**	**148972.71**	**2322.01**	**1340.59**	**4548.54**	**7352.23**	**8660.26**	**864762.78**	**155368.25**	**2889.53**	**158005.62**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

Lake Alimagnet

		AL-1	AL-100	AL-2	AL-200	AL-201	AL-202	AL-3	AL-4	AL-5	AL-6	AL-7	AL-8	AL-9	AL-11	AL-12	AL-13	AL-14	BD-1	BD-10	BD-100	BD-101
Routed TO:		AL-2	AL-1	AL-8	AL-2	AL-2	AL-2	AL-8	AL-5	AL-6	AL-7	AL-8	AL-9	WVR-40	AL-13	AL-LL	AL-5	AL-LL	BD-102	BD-11	BD-102	BD-LL
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		3.8	11.1	56.7	1.9	4.2	10.2	11.6	13.0	40.9	22.4	2.6	42.6	194.3	21.0	9.5	7.9	7.4	30.6	32.1	3.0	1.6
Total watershed area (w/o wat	acres	3.3	10.7	55.7	1.8	4.2	9.7	11.3	12.7	40.0	21.7	2.1	41.7	150.2	20.5	9.0	7.5	7.2	30.5	30.9	2.8	1.6
basin area	acres	0.50	0.39	0.98	0.10	0.08	0.53	0.29	0.30	0.89	0.67	0.53	0.87	44.00	0.48	0.43	0.42	0.14	0.09	1.27	0.18	0.00
basin volume	acre-ft	0.59	0.39	1.80	0.04	0.03	0.65	0.24	0.13	1.74	1.76	0.54	1.41	0.00	0.55	0.46	0.44	0.07	0.03	2.78	0.11	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	3%	2%	0%	0%	0%	11%	95%	92%	95%	100%	55%	47%	60%	34%	18%	99%	100%	86%	100%	100%
Medium Density Residential		100%	97%	68%	70%	46%	73%	83%	0%	0%	0%	0%	29%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	8%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	4%	0%	0%	1%	0%	0%	14%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	48%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	40%	66%	81%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	23%	16%	54%	27%	6%	3%	5%	5%	0%	10%	0%	1%	0%	1%	1%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING…….																						
tributary land area	ac	13.93	10.68	85.27	1.79	4.17	9.66	11.28	12.68	80.60	102.28	104.39	242.65	409.17	20.49	9.05	27.95	7.24	30.52	199.63	2.84	1.63
tributary water area	ac	0.89	0.39	2.58	0.10	0.08	0.53	0.29	0.30	2.08	2.76	3.29	7.02	51.59	0.48	0.43	0.89	0.14	0.09	2.26	0.18	0.00
direct and ponded area	ac	14.82	11.07	87.85	1.89	4.25	10.19	11.57	12.98	82.68	105.04	107.68	249.67	460.76	20.96	9.48	28.85	7.38	30.61	201.89	3.02	1.63
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	450.00	450.00	430.82	428.20	422.94	436.37	447.14	446.83	446.63	447.57	449.97	430.61	320.76	489.27	515.57	529.50	449.38	450.00	422.19	449.99	449.99
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.32	0.44	0.46	0.56	0.62	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	10.60	10.52	10.63	11.01	10.03	10.31	10.19	7.69	7.44	7.55	7.45	8.24	4.52	5.80	4.69	4.03	7.47	7.45	6.86	7.45	7.45
unit export	lbs/ac-y	1.08	1.07	1.03	1.06	0.96	1.02	1.03	0.77	0.75	0.76	0.76	0.82	0.41	0.62	0.53	0.47	0.76	0.76	0.68	0.76	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	2.87	9.36	49.36	1.65	3.48	8.30	9.58	8.13	24.79	13.64	1.31	28.63	56.57	9.90	3.54	2.51	4.51	18.94	17.65	1.76	1.01
upstream pond	ac-ft/yr	9.36	0.00	25.67	0.00	0.00	0.00	0.00	0.00	20.53	45.32	58.97	144.88	181.56	0.00	0.00	9.90	0.00	0.00	102.07	0.00	0.00
total inflow	**ac-ft/yr**	**12.23**	**9.36**	**75.03**	**1.65**	**3.48**	**8.30**	**9.58**	**8.13**	**45.32**	**58.97**	**60.27**	**173.51**	**238.13**	**9.90**	**3.54**	**12.40**	**4.51**	**18.94**	**119.72**	**1.76**	**1.01**
outflow	ac-ft/yr	12.23	9.36	75.03	1.65	3.48	8.30	9.58	8.13	45.32	58.97	60.27	173.51	238.13	9.90	3.54	12.40	4.51	18.94	119.72	1.76	1.01
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	3.51	11.45	57.54	1.90	4.02	9.87	11.65	9.81	30.07	16.57	1.60	34.35	61.09	12.69	4.76	3.50	5.51	23.17	20.96	2.15	1.24
upstream pond	lbs/yr	6.64	0.00	16.06	0.00	0.00	0.00	0.00	0.00	15.69	25.61	26.23	76.19	97.07	0.00	0.00	7.78	0.00	0.00	96.18	0.00	0.00
total inflow	**lbs/yr**	**10.15**	**11.45**	**73.60**	**1.90**	**4.02**	**9.87**	**11.65**	**9.81**	**45.76**	**42.18**	**27.83**	**110.53**	**158.17**	**12.69**	**4.76**	**11.28**	**5.51**	**23.17**	**117.15**	**2.15**	**1.24**
net sedimentation	lbs/yr	3.86	4.81	28.51	0.53	0.82	4.66	4.23	2.64	20.15	15.96	4.14	20.30	0.00	4.91	1.84	2.76	1.59	2.38	46.02	0.80	0.00
outflow	lbs/yr	6.29	6.64	45.09	1.37	3.19	5.21	7.41	7.17	25.61	26.23	23.68	90.23	158.17	7.78	2.92	8.52	3.92	20.79	71.13	1.35	1.24
p removal efficiency	%	38.06	42.04	38.74	27.86	20.51	47.23	36.35	26.91	44.03	37.83	14.89	18.37	0.00	38.68	38.58	24.49	28.85	10.27	39.28	37.18	0.08
upstream w-shed p load	lbs/yr	14.96	11.45	88.29	1.90	4.02	9.87	11.65	9.81	56.07	72.64	74.24	208.53	279.89	12.69	4.76	16.19	5.51	23.17	144.74	2.15	1.24
total removal %	%	57.98	42.04	48.93	27.86	20.51	47.23	36.35	26.91	54.32	63.89	68.10	56.73	43.49	38.68	38.58	47.38	28.85	10.27	50.86	37.18	0.08
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.19	1.01	1.84	0.41	0.36	1.23	0.83	0.43	1.96	2.61	1.02	1.62	0.00	1.15	1.08	1.05	0.52	0.39	2.18	0.60	0.10
relative volume	inches	7.14	1.45	1.27	0.84	0.28	2.72	0.86	0.55	2.43	4.47	14.28	1.70	0.00	1.92	4.54	6.03	0.55	0.06	5.45	2.09	0.00
residence time	years	0.05	0.04	0.02	0.02	0.01	0.08	0.02	0.02	0.04	0.03	0.01	0.01	0.00	0.06	0.13	0.04	0.02	0.00	0.02	0.06	0.00
residence time	days	17.68	15.32	8.78	8.87	2.99	28.69	9.07	5.84	14.01	10.89	3.27	2.97	0.00	20.22	47.84	12.87	5.84	0.67	8.47	22.04	0.00
overflow rate	ft/yr	24.47	24.00	76.56	16.80	43.56	15.67	33.26	26.74	51.10	87.49	114.37	199.44	5.41	20.75	8.21	29.82	32.22	210.47	94.12	9.95	10122.47
inflow phos conc	ppb	305.25	450.02	360.93	424.55	424.26	437.41	447.34	444.11	371.44	263.21	169.86	234.38	244.37	471.64	495.24	334.54	449.23	450.02	360.01	450.02	450.02
outflow phos conc	ppb	189.08	260.83	221.12	306.29	337.25	230.83	284.73	324.59	207.91	163.65	144.56	191.34	244.37	289.20	304.16	252.61	319.64	403.80	218.59	282.71	449.64
p reaction rate	-	0.99	1.25	1.03	0.54	0.32	1.70	0.90	0.50	1.41	0.98	0.21	0.28	0.00	1.03	1.02	0.43	0.57	0.13	1.07	0.94	0.00
1-rp	-	0.62	0.58	0.61	0.72	0.79	0.53	0.64	0.73	0.56	0.62	0.85	0.82	1.00	0.61	0.61	0.76	0.71	0.90	0.61	0.63	1.00
vlawmo pond volume	acre-ft	0.21	0.68	3.56	0.12	0.25	0.60	0.69	0.59	1.79	0.99	0.09	2.07	4.09	0.71	0.26	0.18	0.33	1.37	1.27	0.13	0.07
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	450.00	450.00	430.82	428.20	422.94	436.37	447.14	446.83	446.63	447.57	449.97	430.61	320.76	489.27	515.57	529.50	449.38	450.00	422.19	449.99	449.99
runoff coefficient		0.31	0.30	0.31	0.32	0.29	0.30	0.29	0.22	0.22	0.22	0.22	0.24	0.13	0.17	0.14	0.12	0.22	0.22	0.20	0.22	0.22
dissolved/total P		0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.32	0.44	0.46	0.56	0.62	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	142.12	140.00	140.00	144.45	179.90	170.09	189.91	202.03	140.00	140.00	150.57	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	1089.80	3551.23	18726.99	624.46	1322.14	3150.33	3634.23	3084.26	9467.87	5175.46	496.65	10935.03	23977.90	4205.99	1672.76	1290.88	1711.33	7186.67	6936.93	668.23	384.05
upstream pond	lbs/yr	1112.72	0.00	2584.72	0.00	0.00	0.00	0.00	0.00	2854.66	3696.76	3194.00	11406.99	15344.26	0.00	0.00	1472.09	0.00	0.00	23071.31	0.00	0.00
total inflow	**lbs/yr**	**2202.51**	**3551.23**	**21311.72**	**624.46**	**1322.14**	**3150.33**	**3634.23**	**3084.26**	**12322.53**	**8872.22**	**3690.65**	**22342.02**	**39322.16**	**4205.99**	**1672.76**	**2762.98**	**1711.33**	**7186.67**	**30008.24**	**668.23**	**384.05**
p removal efficiency (no inf)	%	39.00	43.00	39.00	28.00	21.00	48.00	37.00	27.00	45.00	38.00	15.00	19.00	0.00	39.00	39.00	25.00	29.00	11.00	40.00	38.00	0.00
tss removal efficiency (no inf)	%	65.00	68.67	65.00	55.00	41.25	76.00	63.00	53.04	70.00	64.00	29.46	37.32	0.00	65.00	65.00	49.11	55.88	21.61	66.00	64.00	0.00
net sedimentation	lbs/yr	1431.63	2438.51	13852.62	343.45	545.38	2394.25	2289.56	1635.76	8625.77	5678.22	1087.42	8338.36	0.00	2733.89	1087.30	1356.82	956.20	1552.83	19805.44	427.67	0.00
outflow	lbs/yr	770.88	1112.72	7459.10	281.01	776.76	756.08	1344.66	1448.50	3696.76	3194.00	2603.23	14003.66	39322.16	1472.09	585.47	1406.16	755.12	5633.84	10202.80	240.56	384.05
tss removal efficiency (inf)	%	65.00	68.67	65.00	55.00	41.25	76.00	63.00	53.04	70.00	64.00	29.46	37.32	0.00	65.00	65.00	49.11	55.88	21.61	66.00	64.00	0.00
upstream watershed tss load	lbs/yr	4641.02	3551.23	28464.95	624.46	1322.14	3150.33	3634.23	3084.26	18049.01	23224.46	23721.12	66755.32	94117.32	4205.99	1672.76	5496.87	1711.33	7186.67	45997.77	668.23	384.05
tss total removal efficiency	%	83.39	68.67	73.80	55.00	41.25	76.00	63.00	53.04	79.52	86.25	89.03	79.02	58.22	65.00	65.00	74.42	55.88	21.61	77.82	64.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**12.23**	**9.36**	**75.03**	**1.65**	**3.48**	**8.30**	**9.58**	**8.13**	**45.32**	**58.97**	**60.27**	**173.51**	**238.13**	**9.90**	**3.54**	**12.40**	**4.51**	**18.94**	**119.72**	**1.76**	**1.01**
Adjusted TP outflow	**lbs/yr**	**6.29**	**6.64**	**45.09**	**1.37**	**3.19**	**5.21**	**7.41**	**7.17**	**25.61**	**26.23**	**23.68**	**90.23**	**158.17**	**7.78**	**2.92**	**8.52**	**3.92**	**20.79**	**71.13**	**1.35**	**1.24**
Adjusted TSS outflow	**lbs/yr**	**770.88**	**1112.72**	**7459.10**	**281.01**	**776.76**	**756.08**	**1344.66**	**1448.50**	**3696.76**	**3194.00**	**2603.23**	**14003.66**	**39322.16**	**1472.09**	**585.47**	**1406.16**	**755.12**	**5633.84**	**10202.80**	**240.56**	**384.05**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		BD-102	BD-103	BD-104	BD-11	BD-110	BD-12	BD-120	BD-13	BD-14	BD-140	BD-15	BD-150	BD-2	BD-3	BD-4	BD-5	BD-6	BD-61	BD-7	BD-70	BD-71
Routed TO:		BD-10	BD-LL	BD-LL	Burnsville	BD-LL	BD-11	BD-LL	BD-LL	Burnsville	BD-14	BD-14	BD-LL	BD-LL	BD-102	BD-5	BD-7	BD-11	BD-6	BD-102	BD-7	BD-102
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		26.6	2.7	1.6	32.1	3.7	3.1	2.0	9.4	43.8	18.8	47.5	6.8	21.3	5.6	6.1	25.2	4.6	12.2	63.1	6.2	3.4
Total watershed area (w/o wat	acres	26.4	2.6	1.6	31.2	3.3	2.6	2.0	8.4	42.0	17.9	47.3	6.8	20.6	5.6	6.0	25.0	4.5	12.0	62.9	6.2	3.4
basin area	acres	0.25	0.19	0.00	0.84	0.39	0.49	0.00	0.96	1.78	0.88	0.14	0.05	0.66	0.00	0.09	0.15	0.12	0.25	0.24	0.00	0.00
basin volume	acre-ft	0.19	0.12	0.00	2.77	0.39	0.57	0.00	1.74	2.41	1.52	0.07	0.01	0.93	0.00	0.03	0.08	0.06	0.18	0.17	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		99%	100%	44%	87%	32%	100%	34%	100%	88%	78%	96%	50%	80%	100%	100%	100%	100%	100%	94%	42%	100%
Medium Density Residential		0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	5%	0%	0%	0%	0%	8%	8%	1%	0%	0%	0%	0%	0%	0%	0%	2%	58%	0%
Open Space		1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	56%	6%	68%	0%	66%	0%	4%	14%	3%	50%	7%	0%	0%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	168.76	2.56	1.58	273.46	3.29	2.57	1.98	8.45	107.23	17.91	47.33	6.80	20.64	5.55	6.03	31.05	16.48	11.98	100.13	6.17	3.36
tributary water area	ac	0.99	0.19	0.00	6.04	0.39	0.49	0.00	0.96	2.81	0.88	0.14	0.05	0.66	0.00	0.09	0.23	0.37	0.25	0.47	0.00	0.00
direct and ponded area	ac	169.75	2.74	1.58	279.50	3.68	3.06	1.98	9.41	110.04	18.79	47.47	6.85	21.30	5.55	6.11	31.28	16.85	12.23	100.60	6.17	3.36
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	448.69	449.99	421.81	436.21	416.22	449.99	416.83	450.00	432.52	427.51	445.84	424.85	446.43	450.00	450.00	450.00	450.00	450.00	436.28	333.52	450.00
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30
unit runoff	in/yr	7.42	7.45	8.63	7.41	8.87	7.45	8.84	7.45	7.20	7.41	7.45	8.50	8.01	7.45	7.45	7.45	7.45	7.45	7.19	5.00	7.45
unit export	lbs/ac-y	0.76	0.76	0.82	0.74	0.83	0.76	0.83	0.76	0.72	0.73	0.75	0.81	0.81	0.76	0.76	0.76	0.76	0.76	0.72	0.42	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	16.29	1.59	1.13	19.26	2.43	1.59	1.46	5.24	25.21	11.05	29.39	4.82	13.77	3.44	3.74	15.53	2.79	7.44	37.70	2.57	2.09
upstream pond	ac-ft/yr	85.77	0.00	0.00	148.13	0.00	0.00	0.00	0.00	40.44	0.00	0.00	0.00	0.00	0.00	0.00	3.74	7.44	0.00	21.84	0.00	0.00
total inflow	**ac-ft/yr**	**102.07**	**1.59**	**1.13**	**167.39**	**2.43**	**1.59**	**1.46**	**5.24**	**65.65**	**11.05**	**29.39**	**4.82**	**13.77**	**3.44**	**3.74**	**19.27**	**10.23**	**7.44**	**59.54**	**2.57**	**2.09**
outflow	ac-ft/yr	102.07	1.59	1.13	167.39	2.43	1.59	1.46	5.24	65.65	11.05	29.39	4.82	13.77	3.44	3.74	19.27	10.23	7.44	59.54	2.57	2.09
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	19.92	1.94	1.29	23.11	2.73	1.95	1.64	6.41	30.18	13.05	35.71	5.52	16.69	4.21	4.57	19.00	3.42	9.10	45.59	2.62	2.55
upstream pond	lbs/yr	86.72	0.00	0.00	88.45	0.00	0.00	0.00	0.00	37.09	0.00	0.00	0.00	0.00	0.00	0.00	3.57	5.88	0.00	21.39	0.00	0.00
total inflow	**lbs/yr**	**106.63**	**1.94**	**1.29**	**111.56**	**2.73**	**1.95**	**1.64**	**6.41**	**67.27**	**13.05**	**35.71**	**5.52**	**16.69**	**4.21**	**4.57**	**22.56**	**9.29**	**9.10**	**66.98**	**2.62**	**2.55**
net sedimentation	lbs/yr	10.45	0.74	0.00	33.72	1.25	0.99	0.00	3.66	27.60	6.99	4.67	0.64	8.09	0.00	1.01	3.79	1.48	3.22	9.16	0.00	0.00
outflow	lbs/yr	96.18	1.20	1.29	77.84	1.48	0.96	1.64	2.75	39.67	6.06	31.03	4.89	8.59	4.21	3.57	18.77	7.81	5.88	57.81	2.62	2.55
p removal efficiency	%	9.80	38.19	0.07	30.23	45.82	50.78	0.05	57.13	41.03	53.58	13.08	11.56	48.50	0.02	21.99	16.79	15.94	35.39	13.68	0.03	0.04
upstream w-shed p load	lbs/yr	123.78	1.94	1.29	202.07	2.73	1.95	1.64	6.41	78.93	13.05	35.71	5.52	16.69	4.21	4.57	23.57	12.51	9.10	71.77	2.62	2.55
total removal %	%	22.29	38.19	0.07	61.48	45.82	50.78	0.05	57.13	49.74	53.58	13.08	11.56	48.50	0.02	21.99	20.34	37.57	35.39	19.45	0.03	0.04
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.76	0.62	0.10	3.30	1.01	1.17	0.10	1.82	1.35	1.72	0.52	0.26	1.42	0.10	0.37	0.53	0.47	0.75	0.73	0.10	0.10
relative volume	inches	0.41	2.52	0.00	4.97	5.60	12.45	0.00	11.52	3.30	4.77	0.09	0.09	2.35	0.00	0.30	0.17	0.69	0.85	0.16	0.00	0.00
residence time	years	0.00	0.07	0.00	0.02	0.16	0.36	0.00	0.33	0.04	0.14	0.00	0.00	0.07	0.00	0.01	0.00	0.01	0.02	0.00	0.00	0.00
residence time	days	0.68	26.54	0.00	6.04	59.09	131.22	0.00	121.45	13.38	50.25	0.92	1.00	24.74	0.00	3.14	1.46	2.00	9.00	1.06	0.00	0.00
overflow rate	ft/yr	405.03	8.53	11344.10	199.27	6.22	3.25	14551.19	5.46	36.80	12.50	206.98	96.36	20.93	34442.35	43.48	131.98	85.23	30.23	251.23	25708.44	20852.01
inflow phos conc	ppb	384.38	450.02	418.84	245.21	413.65	450.02	414.20	450.02	376.98	434.34	446.97	421.79	445.77	450.02	450.02	430.82	334.24	450.02	413.87	374.44	450.02
outflow phos conc	ppb	346.71	278.17	418.55	171.09	224.13	221.50	413.98	192.92	222.30	201.63	388.50	373.04	229.57	449.91	351.07	358.47	280.97	290.77	357.24	374.33	449.84
p reaction rate	-	0.12	1.00	0.00	0.62	1.56	2.10	0.00	3.11	1.18	2.49	0.17	0.15	1.83	0.00	0.36	0.24	0.23	0.85	0.18	0.00	0.00
1-rp	-	0.90	0.62	1.00	0.70	0.54	0.49	1.00	0.43	0.59	0.46	0.87	0.88	0.51	1.00	0.78	0.83	0.84	0.65	0.86	1.00	1.00
vlawmo pond volume	acre-ft	1.18	0.11	0.08	1.39	0.18	0.12	0.11	0.38	1.82	0.80	2.12	0.35	0.99	0.25	0.27	1.12	0.20	0.54	2.72	0.19	0.15
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	448.69	449.99	421.81	436.21	416.22	449.99	416.83	450.00	432.52	427.51	445.84	424.85	446.43	450.00	450.00	450.00	450.00	450.00	436.28	333.52	450.00
runoff coefficient		0.21	0.22	0.25	0.21	0.26	0.22	0.26	0.22	0.21	0.21	0.22	0.25	0.23	0.22	0.22	0.22	0.22	0.22	0.21	0.14	0.22
dissolved/total P		0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30
runoff TSS conc	ppm	140.40	140.00	140.00	144.07	140.00	140.00	140.00	140.00	145.89	145.94	141.02	140.00	140.00	140.00	140.00	140.00	140.00	140.00	144.20	184.26	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	6186.34	602.30	430.40	7401.67	920.90	604.89	552.08	1988.35	9746.47	4270.45	11186.15	1827.97	5225.08	1306.75	1418.58	5891.97	1059.30	2821.11	14435.71	1175.48	791.13
upstream pond	lbs/yr	22524.63	0.00	0.00	12891.30	0.00	0.00	0.00	0.00	8537.00	0.00	0.00	0.00	0.00	0.00	0.00	805.55	1072.02	0.00	5636.51	0.00	0.00
total inflow	**lbs/yr**	**28710.96**	**602.30**	**430.40**	**20292.97**	**920.90**	**604.89**	**552.08**	**1988.35**	**18283.48**	**4270.45**	**11186.15**	**1827.97**	**5225.08**	**1306.75**	**1418.58**	**6697.53**	**2131.32**	**2821.11**	**20072.22**	**1175.48**	**791.13**
p removal efficiency (no inf)	%	10.00	39.00	0.00	31.00	46.00	51.00	0.00	58.00	42.00	54.00	14.00	12.00	49.00	0.00	22.00	17.00	16.00	36.00	14.00	0.00	0.00
tss removal efficiency (no inf)	%	19.64	65.00	0.00	57.63	72.00	83.00	0.00	93.00	68.00	90.00	27.50	23.57	78.50	0.00	43.21	33.39	31.43	62.00	27.50	0.00	0.00
net sedimentation	lbs/yr	5639.65	391.50	0.00	11693.83	663.05	502.06	0.00	1849.17	12432.76	3843.40	3076.19	430.88	4101.69	0.00	613.03	2236.50	669.84	1749.09	5519.86	0.00	0.00
outflow	lbs/yr	23071.31	210.81	430.40	8599.15	257.85	102.83	552.08	139.18	5850.71	427.04	8109.96	1397.09	1123.39	1306.75	805.55	4461.03	1461.47	1072.02	14552.36	1175.48	791.13
tss removal efficiency (inf)	%	19.64	65.00	0.00	57.63	72.00	83.00	0.00	93.00	68.00	90.00	27.50	23.57	78.50	0.00	43.21	33.39	31.43	62.00	27.50	0.00	0.00
upstream watershed tss load	lbs/yr	39060.85	602.30	430.40	64176.38	920.90	604.89	552.08	1988.35	25203.07	4270.45	11186.15	1827.97	5225.08	1306.75	1418.58	7310.56	3880.40	2821.11	22921.74	1175.48	791.13
tss total removal efficiency	%	40.93	65.00	0.00	86.60	72.00	83.00	0.00	93.00	76.79	90.00	27.50	23.57	78.50	0.00	43.21	38.98	62.34	62.00	36.51	0.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**102.07**	**1.59**	**1.13**	**167.39**	**2.43**	**1.59**	**1.46**	**5.24**	**65.65**	**11.05**	**29.39**	**4.82**	**13.77**	**3.44**	**3.74**	**19.27**	**10.23**	**7.44**	**59.54**	**2.57**	**2.09**
Adjusted TP outflow	**lbs/yr**	**96.18**	**1.20**	**1.29**	**77.84**	**1.48**	**0.96**	**1.64**	**2.75**	**39.67**	**6.06**	**31.03**	**4.89**	**8.59**	**4.21**	**3.57**	**18.77**	**7.81**	**5.88**	**57.81**	**2.62**	**2.55**
Adjusted TSS outflow	**lbs/yr**	**23071.31**	**210.81**	**430.40**	**8599.15**	**257.85**	**102.83**	**552.08**	**139.18**	**5850.71**	**427.04**	**8109.96**	**1397.09**	**1123.39**	**1306.75**	**805.55**	**4461.03**	**1461.47**	**1072.02**	**14552.36**	**1175.48**	**791.13**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		BD-8	BD-9	BD-90	EVR-1	EVR-2	EVR-3	EVR-4	EVR-5	EVR-6	EVR-7	EVR-8	EVR-10	EVR-11	EVR-12	EVR-13	EVR-14	EVR-15	EVR-150	EVR-151	EVR-16	EVR-160
Routed TO:		BD-11	BD-11	BD-9	EVR-13	EVR-7	EVR-LL	EVR-7	EVR-7	EVR-7	EVR-8	EVR-11	EVR-170	EVR-12	EVR-17	EVR-17	EVR-17	EVR-LL	EVR-15	EVR-170	EVR-LL	EVR-LL
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		8.5	8.1	9.0	19.1	84.2	15.8	84.2	79.3	16.6	79.9	28.7	74.1	15.8	61.0	84.3	25.8	12.1	7.8	23.5	7.1	6.8
Total watershed area (w/o wat	acres	8.1	7.3	8.2	18.2	76.5	15.4	83.4	78.8	16.0	79.0	28.4	73.6	15.5	55.4	83.9	23.0	12.1	6.8	23.3	6.9	6.7
basin area	acres	0.41	0.85	0.83	0.87	7.68	0.43	0.84	0.48	0.58	0.94	0.25	0.46	0.29	5.64	0.32	2.72	0.00	0.99	0.14	0.16	0.13
basin volume	acre-ft	0.43	1.41	1.37	1.48	35.26	0.46	1.40	0.55	0.76	1.04	0.19	0.52	0.24	9.98	0.16	9.91	0.00	1.83	0.07	0.09	0.06
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		66%	96%	26%	39%	97%	25%	90%	96%	24%	93%	87%	89%	96%	89%	53%	99%	100%	100%	99%	100%	97%
Medium Density Residential		34%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	38%	3%	0%	1%	0%	0%	3%	0%	0%	0%	0%	32%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	1%	75%	0%	4%	65%	4%	0%	0%	0%	10%	13%	1%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	3%	0%	0%	0%	0%	10%	0%	13%	0%	4%	1%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	4%	57%	21%	0%	0%	9%	0%	0%	0%	0%	11%	0%	0%	1%	0%	0%	0%	1%	0%	3%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	8.13	15.44	8.16	18.23	76.49	15.39	83.38	78.79	16.03	333.66	362.08	73.60	377.59	432.95	233.48	23.05	18.92	6.79	23.34	6.93	6.68
tributary water area	ac	0.41	1.68	0.83	0.87	7.68	0.43	0.84	0.48	0.58	10.52	10.78	0.46	11.07	16.71	10.52	2.72	0.99	0.99	0.14	0.16	0.13
direct and ponded area	ac	8.54	17.11	8.99	19.10	84.17	15.82	84.22	79.27	16.61	344.18	372.85	74.06	388.66	449.66	244.00	25.77	19.91	7.78	23.48	7.09	6.81
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	450.00	448.16	421.74	394.89	446.17	300.88	444.30	441.22	293.52	438.95	418.14	443.52	440.15	428.43	389.96	447.81	450.00	450.00	449.43	450.00	448.43
runoff ortho p/total p	-	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.33	0.30	0.34	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	8.52	7.52	9.20	9.32	7.53	4.31	7.71	7.26	4.11	7.39	6.72	7.64	7.22	6.99	8.23	7.40	7.45	7.45	7.47	7.45	7.51
unit export	lbs/ac-y	0.87	0.76	0.88	0.82	0.76	0.33	0.77	0.73	0.31	0.74	0.67	0.77	0.73	0.70	0.73	0.75	0.76	0.76	0.76	0.76	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	5.77	4.56	6.26	14.16	47.99	5.53	53.57	47.68	5.49	48.64	15.91	46.88	9.33	32.26	57.58	14.21	7.53	4.21	14.53	4.30	4.18
upstream pond	ac-ft/yr	0.00	6.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	154.73	203.37	0.00	219.28	228.61	95.65	0.00	4.21	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**5.77**	**10.82**	**6.26**	**14.16**	**47.99**	**5.53**	**53.57**	**47.68**	**5.49**	**203.37**	**219.28**	**46.88**	**228.61**	**260.87**	**153.24**	**14.21**	**11.74**	**4.21**	**14.53**	**4.30**	**4.18**
outflow	ac-ft/yr	5.77	10.82	6.26	14.16	47.99	5.53	53.57	47.68	5.49	203.37	219.28	46.88	228.61	260.87	153.24	14.21	11.74	4.21	14.53	4.30	4.18
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	7.05	5.55	7.15	15.04	58.11	5.08	64.39	57.81	5.01	58.43	19.10	56.44	11.36	38.61	61.54	17.35	9.21	5.15	17.74	5.26	5.10
upstream pond	lbs/yr	0.00	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.03	130.85	0.00	145.08	149.86	31.96	0.00	2.17	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**7.05**	**8.85**	**7.15**	**15.04**	**58.11**	**5.08**	**64.39**	**57.81**	**5.01**	**155.46**	**149.96**	**56.44**	**156.44**	**188.47**	**93.50**	**17.35**	**11.38**	**5.15**	**17.74**	**5.26**	**5.10**
net sedimentation	lbs/yr	3.20	4.15	3.85	7.54	40.56	2.10	27.32	18.22	2.20	24.61	4.88	17.35	6.58	71.01	3.48	11.66	0.00	2.98	3.40	1.66	1.43
outflow	lbs/yr	3.86	4.70	3.30	7.49	17.55	2.99	37.08	39.59	2.81	130.85	145.08	39.09	149.86	117.46	90.02	5.69	11.38	2.17	14.34	3.61	3.67
p removal efficiency	%	45.32	46.92	53.89	50.16	69.80	41.24	42.42	31.52	43.95	15.83	3.25	30.74	4.21	37.68	3.72	67.21	0.01	57.83	19.16	31.47	28.04
upstream w-shed p load	lbs/yr	7.05	12.70	7.15	15.04	58.11	5.08	64.39	57.81	5.01	243.77	262.87	56.44	274.23	312.84	171.62	17.35	14.36	5.15	17.74	5.26	5.10
total removal %	%	45.32	63.03	53.89	50.16	69.80	41.24	42.42	31.52	43.95	46.32	44.81	30.74	45.35	62.45	47.55	67.21	20.75	57.83	19.16	31.47	28.04
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.04	1.67	1.65	1.70	4.59	1.07	1.66	1.15	1.31	1.11	0.76	1.13	0.84	1.77	0.51	3.64	0.10	1.85	0.52	0.56	0.49
relative volume	inches	2.56	10.74	7.59	3.62	25.44	2.87	0.90	0.40	4.78	0.74	0.42	0.38	0.91	10.71	0.10	24.14	0.00	15.08	0.17	0.72	0.53
residence time	years	0.07	0.13	0.22	0.10	0.73	0.08	0.03	0.01	0.14	0.01	0.00	0.01	0.00	0.04	0.00	0.70	0.00	0.44	0.00	0.02	0.02
residence time	days	27.02	47.74	79.98	38.20	268.16	30.23	9.53	4.24	50.36	1.87	0.32	4.05	0.39	13.96	0.38	254.47	0.00	159.04	1.81	7.64	5.57
overflow rate	ft/yr	14.06	12.79	7.54	16.27	6.25	12.93	63.77	99.34	9.47	216.35	866.70	101.91	780.24	46.25	484.92	5.23	117387.95	4.25	103.77	26.88	32.19
inflow phos conc	ppb	450.02	300.95	420.68	390.70	445.50	337.87	442.28	446.10	336.03	281.25	251.61	443.01	251.77	265.81	224.49	449.06	356.66	450.02	449.30	450.02	448.03
outflow phos conc	ppb	246.07	159.74	193.97	194.74	134.54	198.55	254.66	305.48	188.34	236.73	243.43	306.81	241.17	165.66	216.14	147.24	356.64	189.77	363.21	308.41	322.40
p reaction rate	-	1.52	1.67	2.53	2.02	7.65	1.19	1.28	0.67	1.40	0.22	0.03	0.64	0.05	0.97	0.04	6.25	0.00	3.25	0.29	0.67	0.54
1-rp	-	0.55	0.53	0.46	0.50	0.30	0.59	0.58	0.68	0.56	0.84	0.97	0.69	0.96	0.62	0.96	0.33	1.00	0.42	0.81	0.69	0.72
vlawmo pond volume	acre-ft	0.42	0.33	0.45	1.02	3.47	0.40	3.87	3.44	0.40	3.51	1.15	3.39	0.67	2.33	4.16	1.03	0.54	0.30	1.05	0.31	0.30
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	450.00	448.16	421.74	394.89	446.17	300.88	444.30	441.22	293.52	438.95	418.14	443.52	440.15	428.43	389.96	447.81	450.00	450.00	449.43	450.00	448.43
runoff coefficient		0.25	0.22	0.27	0.27	0.22	0.12	0.22	0.21	0.12	0.21	0.19	0.22	0.21	0.20	0.24	0.21	0.22	0.22	0.22	0.22	0.22
dissolved/total P		0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.33	0.30	0.34	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	140.00	140.00	140.00	142.06	140.47	196.67	140.00	143.34	197.50	143.14	149.68	140.41	142.99	148.05	150.54	140.83	140.00	140.00	140.00	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	2187.81	1730.38	2373.44	5386.67	18233.04	2738.12	20323.62	18283.21	2715.38	18635.54	6143.34	17803.12	3559.72	12554.33	22509.21	5407.05	2855.95	1597.75	5511.85	1631.89	1587.62
upstream pond	lbs/yr	0.00	237.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16064.63	23794.40	0.00	27585.49	28086.30	1949.40	0.00	111.84	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**2187.81**	**1967.73**	**2373.44**	**5386.67**	**18233.04**	**2738.12**	**20323.62**	**18283.21**	**2715.38**	**34700.17**	**29937.74**	**17803.12**	**31145.20**	**40640.63**	**24458.62**	**5407.05**	**2967.80**	**1597.75**	**5511.85**	**1631.89**	**1587.62**
p removal efficiency (no inf)	%	46.00	47.00	54.00	51.00	70.00	42.00	43.00	32.00	44.00	16.00	4.00	31.00	5.00	38.00	4.00	68.00	0.00	58.00	20.00	32.00	29.00
tss removal efficiency (no inf)	%	72.00	74.00	90.00	83.00	93.00	68.00	68.67	58.50	69.33	31.43	7.86	57.63	9.82	64.00	7.86	93.00	0.00	93.00	39.29	58.50	55.88
net sedimentation	lbs/yr	1575.22	1456.12	2136.10	4470.93	16956.73	1861.92	13955.55	10695.68	1882.66	10905.77	2352.25	10259.05	3058.90	26010.00	1921.75	5028.56	0.00	1485.91	2165.37	954.66	887.08
outflow	lbs/yr	612.59	511.61	237.34	915.73	1276.31	876.20	6368.07	7587.53	832.72	23794.40	27585.49	7544.07	28086.30	14630.63	22536.87	378.49	2967.80	111.84	3346.48	677.23	700.54
tss removal efficiency (inf)	%	72.00	74.00	90.00	83.00	93.00	68.00	68.67	58.50	69.33	31.43	7.86	57.63	9.82	64.00	7.86	93.00	0.00	93.00	39.29	58.50	55.88
upstream watershed tss load	lbs/yr	2187.81	4103.83	2373.44	5386.67	18233.04	2738.12	20323.62	18283.21	2715.38	78190.79	84334.13	17803.12	87893.85	100448.17	59528.22	5407.05	4453.70	1597.75	5511.85	1631.89	1587.62
tss total removal efficiency	%	72.00	87.53	90.00	83.00	93.00	68.00	68.67	58.50	69.33	69.57	67.29	57.63	68.05	85.43	62.14	93.00	33.36	93.00	39.29	58.50	55.88
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**5.77**	**10.82**	**6.26**	**14.16**	**47.99**	**5.53**	**53.57**	**47.68**	**5.49**	**203.37**	**219.28**	**46.88**	**228.61**	**260.87**	**153.24**	**14.21**	**11.74**	**4.21**	**14.53**	**4.30**	**4.18**
Adjusted TP outflow	**lbs/yr**	**3.86**	**4.70**	**3.30**	**7.49**	**17.55**	**2.99**	**37.08**	**39.59**	**2.81**	**130.85**	**145.08**	**39.09**	**149.86**	**117.46**	**90.02**	**5.69**	**11.38**	**2.17**	**14.34**	**3.61**	**3.67**
Adjusted TSS outflow	**lbs/yr**	**612.59**	**511.61**	**237.34**	**915.73**	**1276.31**	**876.20**	**6368.07**	**7587.53**	**832.72**	**23794.40**	**27585.49**	**7544.07**	**28086.30**	**14630.63**	**22536.87**	**378.49**	**2967.80**	**111.84**	**3346.48**	**677.23**	**700.54**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS Long Lake

		EVR-17	EVR-170	EVR-18	EVR-180	EVR-19	EVR-190	EVR-20	EVR-21	EVR-210	EVR-211	EVR-22	EVR-220	EVR-221	EVR-24	EVR-25	EVR-26	EVR-27	EVR-28	EVR-280	EVR-29	EVR-290
Routed TO:		EVR-35	EVR-17	EVR-210	EVR-18	EVR-210	EVR-19	EVR-210	EVR-35	EVR-21	EVR-210	EVR-350	EVR-22	EVR-220	EVR-26	EVR-26	EVR-29	EVR-29	EVR-LL	EVR-LL	EVR-352	EVR-352
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		83.4	95.7	66.3	13.1	169.6	46.5	29.3	63.9	57.8	6.0	36.4	3.6	7.0	11.9	14.3	78.3	90.7	5.7	6.2	113.0	9.5
Total watershed area (w/o wat	acres	49.4	88.2	64.1	12.5	164.9	46.4	27.7	62.6	57.1	6.0	33.5	3.3	7.0	11.8	14.1	76.3	90.2	5.7	5.7	110.8	8.9
basin area	acres	34.00	7.46	2.22	0.57	4.76	0.12	1.61	1.31	0.75	0.00	2.85	0.33	0.00	0.12	0.19	2.00	0.50	0.09	0.47	2.23	0.61
basin volume	acre-ft	0.00	10.70	2.26	0.73	13.03	0.06	4.12	3.64	0.80	0.00	8.55	0.30	0.00	0.06	0.12	5.10	0.59	0.03	0.54	9.32	0.82
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		87%	77%	72%	6%	35%	0%	100%	72%	91%	0%	99%	72%	0%	100%	2%	57%	89%	94%	83%	82%	100%
Medium Density Residential		0%	0%	1%	0%	2%	6%	0%	0%	0%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	17%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		1%	0%	8%	92%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	32%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	9%	6%	0%	0%	0%	0%
Open Space		0%	0%	5%	0%	34%	94%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	4%	0%	0%	8%	0%
Golf Course		0%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	84%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		1%	20%	13%	2%	11%	0%	0%	11%	3%	0%	1%	28%	16%	0%	1%	2%	1%	6%	17%	10%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	924.09	185.16	76.62	12.55	211.23	46.38	27.70	441.17	378.60	5.99	44.62	10.31	6.99	11.77	14.12	102.23	90.19	5.66	5.69	303.21	8.89
tributary water area	ac	72.01	8.06	2.79	0.57	4.88	0.12	1.61	11.34	10.03	0.00	3.18	0.33	0.00	0.12	0.19	2.31	0.50	0.09	0.47	5.04	0.61
direct and ponded area	ac	996.09	193.22	79.41	13.11	216.11	46.50	29.31	452.51	388.63	5.99	47.80	10.64	6.99	11.89	14.31	104.54	90.69	5.75	6.16	308.25	9.50
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	425.62	433.72	423.33	357.13	376.85	214.95	449.91	444.49	448.34	423.07	449.62	436.12	525.65	450.00	339.91	398.33	426.98	446.75	441.70	424.91	450.00
runoff ortho p/total p	-	0.30	0.30	0.31	0.30	0.48	0.58	0.30	0.30	0.30	0.33	0.30	0.30	0.64	0.30	0.30	0.30	0.31	0.30	0.30	0.32	0.30
unit runoff	in/yr	7.00	7.76	7.86	11.35	5.02	2.26	7.45	8.94	7.96	9.64	7.46	8.03	4.27	7.45	10.48	8.43	6.98	7.58	7.80	7.20	7.45
unit export	lbs/ac-y	0.69	0.76	0.76	0.91	0.48	0.14	0.76	0.90	0.81	0.97	0.76	0.79	0.48	0.76	0.83	0.76	0.70	0.77	0.78	0.72	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	28.87	57.04	41.96	11.87	69.00	8.74	17.20	46.61	37.83	4.82	20.85	2.22	2.48	7.30	12.34	53.62	52.48	3.57	3.70	66.52	5.52
upstream pond	ac-ft/yr	546.76	61.40	11.87	0.00	8.74	0.00	0.00	191.41	153.58	0.00	5.20	2.48	0.00	0.00	0.00	19.64	0.00	0.00	0.00	125.74	0.00
total inflow	**ac-ft/yr**	**575.62**	**118.44**	**53.83**	**11.87**	**77.74**	**8.74**	**17.20**	**238.03**	**191.41**	**4.82**	**26.04**	**4.71**	**2.48**	**7.30**	**12.34**	**73.26**	**52.48**	**3.57**	**3.70**	**192.25**	**5.52**
outflow	ac-ft/yr	575.62	118.44	53.83	11.87	77.74	8.74	17.20	238.03	191.41	4.82	26.04	4.71	2.48	7.30	12.34	73.26	52.48	3.57	3.70	192.25	5.52
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	34.33	67.43	48.69	11.45	79.13	6.41	21.03	56.28	46.07	5.83	25.47	2.62	3.35	8.93	11.67	57.98	62.90	4.33	4.42	79.27	6.75
upstream pond	lbs/yr	277.12	53.43	6.53	0.00	5.86	0.00	0.00	117.80	89.50	0.00	3.97	3.35	0.00	0.00	0.00	15.96	0.00	0.00	0.00	79.54	0.00
total inflow	**lbs/yr**	**311.45**	**120.86**	**55.22**	**11.45**	**84.99**	**6.41**	**21.03**	**174.08**	**135.57**	**5.83**	**29.44**	**5.96**	**3.35**	**8.93**	**11.67**	**73.93**	**62.90**	**4.33**	**4.42**	**158.81**	**6.75**
net sedimentation	lbs/yr	0.00	56.91	21.18	4.92	43.60	0.56	12.78	52.55	17.77	0.00	18.37	2.59	0.00	2.01	2.63	38.12	19.17	0.99	2.14	74.93	3.46
outflow	lbs/yr	311.45	63.95	34.03	6.53	41.39	5.86	8.25	121.53	117.80	5.83	11.07	3.37	3.35	6.92	9.04	35.81	43.73	3.34	2.28	83.89	3.29
p removal efficiency	%	0.00	47.09	38.36	42.96	51.30	8.67	60.77	30.19	13.11	0.02	62.40	43.44	0.02	22.50	22.57	51.57	30.48	22.91	48.38	47.18	51.23
upstream w-shed p load	lbs/yr	677.75	141.61	60.13	11.45	85.55	6.41	21.03	274.88	218.60	5.83	32.04	5.96	3.35	8.93	11.67	78.58	62.90	4.33	4.42	220.75	6.75
total removal %	%	54.05	54.84	43.40	42.96	51.62	8.67	60.77	55.79	46.11	0.02	65.44	43.45	0.02	22.50	22.57	54.43	30.48	22.91	48.38	62.00	51.23
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.00	1.43	1.02	1.29	2.74	0.47	2.55	2.78	1.07	0.10	3.00	0.90	0.10	0.47	0.63	2.55	1.19	0.39	1.14	4.18	1.35
relative volume	inches	0.00	6.49	1.86	2.13	6.54	0.22	8.29	2.70	0.73	0.00	14.20	4.65	0.00	0.27	0.34	3.29	0.39	0.34	5.01	4.85	5.17
residence time	years	0.00	0.09	0.04	0.06	0.17	0.01	0.24	0.02	0.00	0.00	0.33	0.06	0.00	0.01	0.01	0.07	0.01	0.01	0.14	0.05	0.15
residence time	days	0.00	32.97	15.32	22.44	61.18	2.33	87.43	5.58	1.53	0.00	119.83	23.12	0.00	2.79	3.54	25.41	4.12	3.55	52.84	17.69	54.50
overflow rate	ft/yr	16.93	15.87	24.25	20.93	16.33	72.84	10.65	181.70	255.22	48161.88	9.14	14.26	24846.17	60.85	64.93	36.63	104.95	39.72	7.86	86.21	9.04
inflow phos conc	ppb	199.07	375.43	377.39	354.88	402.23	270.03	449.91	269.07	260.57	445.17	415.94	466.23	495.55	450.02	348.00	371.30	441.04	445.94	439.86	303.92	450.02
outflow phos conc	ppb	199.07	198.66	232.61	202.41	195.89	246.63	176.50	187.84	226.42	445.10	156.38	263.70	495.46	348.77	269.44	179.84	306.62	343.78	227.07	160.53	219.49
p reaction rate	-	0.00	1.68	1.01	1.32	2.16	0.10	3.95	0.62	0.17	0.00	4.41	1.36	0.00	0.37	0.38	2.20	0.63	0.39	1.82	1.69	2.15
1-rp	-	1.00	0.53	0.62	0.57	0.49	0.91	0.39	0.70	0.87	1.00	0.38	0.57	1.00	0.78	0.77	0.48	0.70	0.77	0.52	0.53	0.49
vlawmo pond volume	acre-ft	2.08	4.12	3.03	0.86	4.98	0.63	1.24	3.37	2.73	0.35	1.51	0.16	0.18	0.53	0.89	3.87	3.79	0.26	0.27	4.80	0.40
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	425.62	433.72	423.33	357.13	376.85	214.95	449.91	444.49	448.34	423.07	449.62	436.12	525.65	450.00	339.91	398.33	426.98	446.75	441.70	424.91	450.00
runoff coefficient		0.20	0.22	0.23	0.33	0.15	0.07	0.22	0.26	0.23	0.28	0.22	0.23	0.12	0.22	0.30	0.24	0.20	0.22	0.23	0.21	0.22
dissolved/total P		0.30	0.30	0.31	0.30	0.48	0.58	0.30	0.30	0.30	0.33	0.30	0.30	0.64	0.30	0.30	0.30	0.31	0.30	0.30	0.32	0.30
runoff TSS conc	ppm	148.84	142.18	143.52	140.00	179.86	211.45	140.00	140.04	140.00	148.18	140.00	140.00	203.66	140.00	149.59	147.13	147.73	140.00	140.00	146.08	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	11271.88	21771.32	16008.56	4502.58	29522.63	4611.51	6524.19	17687.15	14352.27	1846.43	7909.80	842.66	1268.54	2770.25	4779.98	20738.87	20322.21	1356.32	1402.19	25499.65	2092.65
upstream pond	lbs/yr	45384.84	10890.55	1410.81	0.00	3796.26	0.00	0.00	20118.75	13397.74	0.00	833.46	1268.54	0.00	0.00	0.00	4139.14	0.00	0.00	0.00	12343.24	0.00
total inflow	**lbs/yr**	**56656.71**	**32661.87**	**17419.37**	**4502.58**	**33318.90**	**4611.51**	**6524.19**	**37805.90**	**27750.00**	**1846.43**	**8743.26**	**2111.20**	**1268.54**	**2770.25**	**4779.98**	**24878.01**	**20322.21**	**1356.32**	**1402.19**	**37842.89**	**2092.65**
p removal efficiency (no inf)	%	0.00	48.00	39.00	43.00	52.00	9.00	61.00	31.00	14.00	0.00	63.00	44.00	0.00	23.00	23.00	52.00	31.00	23.00	49.00	48.00	52.00
tss removal efficiency (no inf)	%	0.00	76.00	65.00	68.67	85.00	17.68	93.00	57.63	27.50	0.00	93.00	69.33	0.00	45.18	45.18	85.00	57.63	45.18	78.50	76.00	85.00
net sedimentation	lbs/yr	0.00	24823.02	11322.59	3091.77	28321.06	815.25	6067.50	21785.65	7631.25	0.00	8131.24	1463.77	0.00	1251.56	2159.53	21146.31	11710.67	612.77	1100.72	28760.60	1778.75
outflow	lbs/yr	56656.71	7838.85	6096.78	1410.81	4997.83	3796.26	456.69	16020.25	20118.75	1846.43	612.03	647.44	1268.54	1518.69	2620.45	3731.70	8611.54	743.55	301.47	9082.29	313.90
tss removal efficiency (inf)	%	0.00	76.00	65.00	68.67	85.00	17.68	93.00	57.63	27.50	0.00	93.00	69.33	0.00	45.18	45.18	85.00	57.63	45.18	78.50	76.00	85.00
upstream watershed tss load	lbs/yr	221741.60	45086.29	20511.15	4502.58	34134.14	4611.51	6524.19	95055.33	77368.18	1846.43	10207.03	2111.20	1268.54	2770.25	4779.98	28289.10	20322.21	1356.32	1402.19	74110.96	2092.65
tss total removal efficiency	%	74.45	82.61	70.28	68.67	85.36	17.68	93.00	83.15	74.00	0.00	94.00	69.33	0.00	45.18	45.18	86.81	57.63	45.18	78.50	87.75	85.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**575.62**	**118.44**	**53.83**	**11.87**	**77.74**	**8.74**	**17.20**	**238.03**	**191.41**	**4.82**	**26.04**	**4.71**	**2.48**	**7.30**	**12.34**	**73.26**	**52.48**	**3.57**	**3.70**	**192.25**	**5.52**
Adjusted TP outflow	**lbs/yr**	**311.45**	**63.95**	**34.03**	**6.53**	**41.39**	**5.86**	**8.25**	**121.53**	**117.80**	**5.83**	**11.07**	**3.37**	**3.35**	**6.92**	**9.04**	**35.81**	**43.73**	**3.34**	**2.28**	**83.89**	**3.29**
Adjusted TSS outflow	**lbs/yr**	**56656.71**	**7838.85**	**6096.78**	**1410.81**	**4997.83**	**3796.26**	**456.69**	**16020.25**	**20118.75**	**1846.43**	**612.03**	**647.44**	**1268.54**	**1518.69**	**2620.45**	**3731.70**	**8611.54**	**743.55**	**301.47**	**9082.29**	**313.90**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

Farquar Lake

Cobblestone Lake

		EVR-30	EVR-31	EVR-32	EVR-33	EVR-34	EVR-35	EVR-350	EVR-351	EVR-352	EVR-36	EVR-37	EVR-38	EVR-39	EVR-40	EVR-400	EVR-41	EVR-42	EVR-43	EVR-430	EVR-44	EVR-440
Routed TO:		EVR-352	EVR-352	EVR-352	EVR-LL	EVR-LL	EVR-39	EVR-35	EVR-352	EVR-35	EVR-37	EVR-39	EVR-39	EVR-40	EVR-43	EVR-40	EVR-44	EVR-44	EVR-44	EVR-43	Lakeville	EVR-44
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		37.8	6.1	2.8	7.1	14.2	142.2	42.4	21.5	6.8	79.8	25.4	14.3	221.3	116.9	8.9	68.9	169.3	89.8	13.2	334.4	19.9
Total watershed area (w/o wat	acres	36.9	6.0	2.5	5.9	12.3	75.2	42.2	21.5	4.8	79.1	25.3	13.8	217.7	113.4	8.9	65.5	169.3	89.3	13.2	300.8	19.9
basin area	acres	0.85	0.13	0.33	1.25	1.89	67.00	0.20	0.00	2.01	0.64	0.17	0.46	3.53	3.50	0.00	3.41	0.00	0.52	0.00	33.60	0.00
basin volume	acre-ft	1.43	0.06	0.30	2.70	5.35	0.00	0.13	0.00	3.65	1.36	0.10	0.51	3.07	10.51	0.00	25.67	0.00	0.63	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	7%	0%	0%	0%	2%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	5%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	0%	0%	60%	0%
Low Density Residential		100%	91%	84%	100%	99%	82%	78%	97%	90%	66%	55%	0%	69%	87%	47%	84%	14%	87%	52%	26%	1%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	100%	8%	0%	0%	0%	0%	0%	0%	5%	28%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	6%	0%	0%	0%	0%	0%	0%	3%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	11%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	11%	0%	1%	0%	0%	0%	2%	0%	0%	0%	38%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	10%	21%	0%	0%	3%	0%	0%	5%	0%	0%	0%	0%	12%	0%	1%	0%
Open Space		0%	9%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	4%	11%	53%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	16%	0%	1%	8%	1%	2%	10%	7%	19%	0%	0%	2%	0%	1%	7%	0%	48%	5%	26%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	36.92	5.99	2.45	5.88	12.27	1911.00	86.83	21.53	383.75	79.14	104.42	13.84	2246.99	2369.31	8.89	65.46	169.32	2471.81	13.23	3184.33	19.91
tributary water area	ac	0.85	0.13	0.33	1.25	1.89	162.70	3.38	0.00	8.97	0.64	0.81	0.46	167.50	171.00	0.00	3.41	0.00	171.52	0.00	211.50	0.00
direct and ponded area	ac	37.77	6.13	2.79	7.13	14.16	2073.69	90.20	21.53	392.72	79.79	105.24	14.29	2414.48	2540.31	8.89	68.87	169.32	2643.33	13.23	3395.84	19.91
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	450.00	426.31	442.02	449.98	449.67	425.71	407.77	446.58	445.08	416.66	428.95	450.00	421.42	421.80	317.19	441.30	140.29	424.23	425.57	175.18	396.12
runoff ortho p/total p	-	0.30	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.33	0.46	0.30	0.09	0.30	0.30	0.12	0.31
unit runoff	in/yr	7.45	6.91	7.78	7.45	7.46	7.20	6.58	7.43	7.65	8.44	9.23	10.60	8.21	6.87	4.42	8.20	2.28	6.91	8.46	3.40	10.22
unit export	lbs/ac-y	0.76	0.69	0.78	0.76	0.76	0.71	0.64	0.75	0.77	0.79	0.89	1.08	0.80	0.69	0.40	0.80	0.23	0.69	0.81	0.34	0.91
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	22.91	3.45	1.59	3.65	7.63	45.08	23.15	13.32	3.03	55.66	19.45	12.22	148.99	64.91	3.28	44.72	32.14	51.40	9.32	85.28	16.96
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	0.00	1104.91	26.04	0.00	239.04	0.00	55.66	0.00	1237.34	1389.60	0.00	0.00	0.00	1463.83	0.00	1782.29	0.00
total inflow	**ac-ft/yr**	**22.91**	**3.45**	**1.59**	**3.65**	**7.63**	**1150.00**	**49.19**	**13.32**	**242.07**	**55.66**	**75.12**	**12.22**	**1386.32**	**1454.51**	**3.28**	**44.72**	**32.14**	**1515.23**	**9.32**	**1867.58**	**16.96**
outflow	ac-ft/yr	22.91	3.45	1.59	3.65	7.63	1150.00	49.19	13.32	242.07	55.66	75.12	12.22	1386.32	1454.51	3.28	44.72	32.14	1515.23	9.32	1867.58	16.96
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	28.03	4.16	1.90	4.47	9.32	53.36	26.98	16.23	3.66	62.27	22.51	14.95	174.13	77.92	3.54	52.39	38.24	61.24	10.71	102.18	18.16
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	563.53	11.07	0.00	121.47	0.00	36.13	0.00	680.74	798.55	0.00	0.00	0.00	739.20	0.00	972.81	0.00
total inflow	**lbs/yr**	**28.03**	**4.16**	**1.90**	**4.47**	**9.32**	**616.89**	**38.05**	**16.23**	**125.12**	**62.27**	**58.63**	**14.95**	**854.87**	**876.47**	**3.54**	**52.39**	**38.24**	**800.44**	**10.71**	**1074.99**	**18.16**
net sedimentation	lbs/yr	14.00	1.16	0.87	2.70	5.98	0.00	3.61	0.00	29.01	26.14	3.28	6.44	59.86	147.98	0.00	38.70	0.00	11.58	0.00	0.00	0.00
outflow	lbs/yr	14.02	3.00	1.04	1.76	3.34	616.89	34.44	16.23	96.11	36.13	55.35	8.51	795.01	728.49	3.54	13.69	38.24	788.86	10.71	1074.99	18.16
p removal efficiency	%	49.97	27.82	45.58	60.56	64.13	0.00	9.49	0.01	23.18	41.99	5.60	43.10	7.00	16.88	0.01	73.86	0.01	1.45	0.01	0.00	0.00
upstream w-shed p load	lbs/yr	28.03	4.16	1.90	4.47	9.32	1346.48	59.02	16.23	281.48	62.27	84.78	14.95	1620.34	1701.79	3.54	52.39	38.24	1773.74	10.71	2164.14	18.16
total removal %	%	49.97	27.82	45.58	60.56	64.13	54.19	41.64	0.01	65.85	41.99	34.71	43.10	50.94	57.19	0.01	73.86	0.01	55.53	0.01	50.33	0.00
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.68	0.49	0.91	2.16	2.83	0.00	0.64	0.10	1.82	2.11	0.58	1.12	0.87	3.00	0.10	7.53	0.10	1.21	0.10	0.00	0.10
relative volume	inches	2.15	0.65	6.55	25.56	24.27	0.00	0.19	0.00	41.71	0.85	0.17	1.44	0.71	5.61	0.00	19.87	0.00	0.42	0.00	0.00	0.00
residence time	years	0.06	0.02	0.19	0.74	0.70	0.00	0.00	0.00	0.02	0.02	0.00	0.04	0.00	0.01	0.00	0.57	0.00	0.00	0.00	0.00	0.00
residence time	days	22.71	6.84	69.07	269.48	255.86	0.00	0.93	0.00	5.50	8.92	0.47	15.20	0.81	2.64	0.00	209.50	0.00	0.15	0.00	0.00	0.00
overflow rate	ft/yr	26.96	26.33	4.79	2.92	4.04	17.16	250.97	133227.13	120.43	86.44	449.82	26.80	392.73	415.10	32753.92	13.12	321431.94	2919.52	93231.35	55.58	169621.42
inflow phos conc	ppb	450.02	444.08	440.24	450.00	449.61	197.36	284.61	448.30	190.17	411.57	287.18	450.02	226.87	221.70	397.70	431.03	437.72	194.36	422.67	211.78	393.97
outflow phos conc	ppb	225.14	320.53	239.58	177.46	161.29	197.36	257.60	448.27	146.08	238.77	271.10	256.07	210.99	184.27	397.64	112.66	437.68	191.54	422.63	211.78	393.95
p reaction rate	-	2.00	0.53	1.54	3.89	4.98	0.00	0.12	0.00	0.39	1.25	0.06	1.33	0.08	0.24	0.00	10.81	0.00	0.01	0.00	0.00	0.00
1-rp	-	0.50	0.72	0.54	0.39	0.36	1.00	0.91	1.00	0.77	0.58	0.94	0.57	0.93	0.83	1.00	0.26	1.00	0.99	1.00	1.00	1.00
vlawmo pond volume	acre-ft	1.65	0.25	0.11	0.26	0.55	3.26	1.67	0.96	0.22	4.02	1.40	0.88	10.76	4.69	0.24	3.23	2.32	3.71	0.67	6.16	1.22
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	450.00	426.31	442.02	449.98	449.67	425.71	407.77	446.58	445.08	416.66	428.95	450.00	421.42	421.80	317.19	441.30	140.29	424.23	425.57	175.18	396.12
runoff coefficient		0.22	0.20	0.22	0.22	0.22	0.21	0.19	0.21	0.22	0.24	0.27	0.31	0.24	0.20	0.13	0.24	0.07	0.20	0.24	0.10	0.30
dissolved/total P		0.30	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.33	0.46	0.30	0.09	0.30	0.30	0.12	0.31
runoff TSS conc	ppm	140.00	147.20	140.00	140.00	140.00	147.66	155.92	140.77	140.00	142.57	140.00	140.00	147.05	148.30	180.33	140.78	47.10	149.20	140.07	56.83	144.12
POND TSS BUDGETS.....																						
runoff	lbs/yr	8692.79	1325.51	603.56	1385.04	2894.70	17526.01	9273.65	5061.15	1149.42	21268.17	7381.10	4636.85	57410.48	24998.89	1382.92	17027.89	12693.81	20120.88	3537.59	32542.82	6499.04
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	90147.71	612.03	0.00	16874.44	0.00	6805.81	0.00	121610.58	152272.09	0.00	0.00	0.00	121612.72	0.00	181159.21	0.00
total inflow	**lbs/yr**	**8692.79**	**1325.51**	**603.56**	**1385.04**	**2894.70**	**107673.73**	**9885.68**	**5061.15**	**18023.86**	**21268.17**	**14186.91**	**4636.85**	**179021.05**	**177270.98**	**1382.92**	**17027.89**	**12693.81**	**141733.60**	**3537.59**	**213702.04**	**6499.04**
p removal efficiency (no inf)	%	50.00	28.00	46.00	61.00	65.00	0.00	10.00	0.00	24.00	42.00	6.00	44.00	8.00	17.00	0.00	74.00	0.00	2.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	81.00	55.00	72.00	93.00	93.00	0.00	19.64	0.00	47.14	68.00	11.79	69.33	15.71	33.39	0.00	93.00	0.00	3.93	0.00	0.00	0.00
net sedimentation	lbs/yr	7041.16	729.03	434.56	1288.09	2692.07	0.00	1941.83	0.00	8496.96	14462.35	1672.03	3214.89	28131.88	59195.85	0.00	15835.94	0.00	5568.11	0.00	0.00	0.00
outflow	lbs/yr	1651.63	596.48	169.00	96.95	202.63	107673.73	7943.85	5061.15	9526.90	6805.81	12514.88	1421.97	150889.17	118075.14	1382.92	1191.95	12693.81	136165.50	3537.59	213702.04	6499.04
tss removal efficiency (inf)	%	81.00	55.00	72.00	93.00	93.00	0.00	19.64	0.00	47.14	68.00	11.79	69.33	15.71	33.39	0.00	93.00	0.00	3.93	0.00	0.00	0.00
upstream watershed tss load	lbs/yr	8692.79	1325.51	603.56	1385.04	2894.70	446839.66	19480.69	5061.15	93036.03	21268.17	28649.27	4636.85	537536.26	563918.06	1382.92	17027.89	12693.81	587576.53	3537.59	722850.68	6499.04
tss total removal efficiency	%	81.00	55.00	72.00	93.00	93.00	75.90	59.22	0.00	89.76	68.00	56.32	69.33	71.93	79.06	0.00	93.00	0.00	76.83	0.00	70.44	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**22.91**	**3.45**	**1.59**	**3.65**	**7.63**	**1150.00**	**49.19**	**13.32**	**242.07**	**55.66**	**75.12**	**12.22**	**1386.32**	**1454.51**	**3.28**	**44.72**	**32.14**	**1515.23**	**9.32**	**1867.58**	**16.96**
Adjusted TP outflow	**lbs/yr**	**14.02**	**3.00**	**1.04**	**1.76**	**3.34**	**616.89**	**34.44**	**16.23**	**96.11**	**36.13**	**55.35**	**8.51**	**795.01**	**728.49**	**3.54**	**13.69**	**38.24**	**788.86**	**10.71**	**1074.99**	**18.16**
Adjusted TSS outflow	**lbs/yr**	**1651.63**	**596.48**	**169.00**	**96.95**	**202.63**	**107673.73**	**7943.85**	**5061.15**	**9526.90**	**6805.81**	**12514.88**	**1421.97**	**150889.17**	**118075.14**	**1382.92**	**1191.95**	**12693.81**	**136165.50**	**3537.59**	**213702.04**	**6499.04**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

Keller Lake

		EVR-45	EVR-46	EVR-47	EVR-48	EVR-49	EVR-50	EVR-51	EVR-52	EVR-53	EVR-54	EVR-55	EVR-550	EVR-551	EVR-552	EVR-553	EVR-56	KL-1	KL-2	KL-20	KL-3	KL-300
Routed TO:		EVR-46	EVR-47	Rosemount	EVR-44	EVR-22	EVR-51	EVR-55	EVR-53	EVR-55	EVR-55	EVR-13	EVR-LL	EVR-LL	EVR-LL	EVR-LL	EVR-45	KL-2	KL-20	Burnsville	KL-2	KL-2
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		37.6	9.0	8.5	160.0	0.8	39.9	22.8	6.6	14.5	17.0	39.7	2.4	3.1	2.0	4.8	0.0	202.3	226.1	104.8	113.4	82.0
Total watershed area (w/o wat	acres	36.1	7.5	6.6	157.0	0.8	37.5	22.4	5.8	12.6	16.9	36.1	2.1	3.1	1.9	4.4	0.0	200.7	226.1	104.8	110.9	82.0
basin area	acres	1.42	1.50	1.92	2.97	0.00	2.43	0.40	0.80	1.94	0.17	3.59	0.36	0.00	0.11	0.41	0.00	1.61	0.00	0.00	2.47	0.00
basin volume	acre-ft	3.33	3.63	5.49	3.69	0.00	8.08	0.41	1.30	5.59	0.09	17.15	0.34	0.00	0.05	0.42	0.00	7.42	0.00	0.00	8.33	0.00
Row Crop Agriculture		0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		99%	94%	88%	1%	98%	94%	85%	84%	75%	67%	39%	33%	24%	62%	64%	100%	77%	84%	72%	90%	61%
Medium Density Residential		0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	10%	23%	0%	4%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	0%	0%	0%	0%	8%	5%	4%	5%	5%
Open Space		0%	0%	0%	2%	0%	0%	0%	0%	0%	14%	3%	62%	57%	38%	31%	0%	0%	0%	0%	4%	9%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		1%	6%	12%	7%	2%	3%	8%	0%	22%	0%	53%	4%	19%	0%	6%	0%	4%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	2%	7%	16%	4%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	36.18	43.70	50.30	157.02	0.79	37.49	59.89	5.83	18.41	16.88	131.31	2.09	3.13	1.86	4.40	0.04	200.70	619.71	724.50	110.92	82.04
tributary water area	ac	1.42	2.91	4.84	2.97	0.00	2.43	2.83	0.80	2.75	0.17	9.33	0.36	0.00	0.11	0.41	0.00	1.61	4.08	4.08	2.47	0.00
direct and ponded area	ac	37.60	46.61	55.14	160.00	0.79	39.92	62.72	6.63	21.15	17.04	140.64	2.44	3.13	1.97	4.80	0.04	202.31	623.79	728.58	113.39	82.04
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	449.58	447.23	444.07	406.01	449.09	443.82	431.40	417.78	432.09	376.20	404.95	292.53	297.19	355.45	370.28	449.58	421.19	428.48	418.15	428.89	412.85
runoff ortho p/total p	-	0.30	0.30	0.30	0.29	0.30	0.30	0.30	0.30	0.30	0.34	0.31	0.49	0.47	0.41	0.39	0.30	0.30	0.30	0.30	0.31	0.33
unit runoff	in/yr	7.46	7.56	7.70	13.24	7.48	7.45	7.37	6.94	7.79	5.83	8.21	3.99	4.58	5.29	5.81	7.45	7.74	7.68	8.25	7.00	7.57
unit export	lbs/ac-y	0.76	0.76	0.77	1.14	0.76	0.75	0.73	0.68	0.76	0.55	0.77	0.34	0.39	0.50	0.56	0.76	0.74	0.75	0.77	0.70	0.74
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	22.48	4.74	4.23	173.23	0.49	23.27	13.76	3.37	8.17	8.20	24.73	0.69	1.19	0.82	2.13	0.02	129.37	144.69	72.06	64.74	51.73
upstream pond	ac-ft/yr	0.02	22.51	27.24	0.00	0.00	0.00	23.27	0.00	3.37	0.00	56.77	0.00	0.00	0.00	0.00	0.00	0.00	245.83	390.52	0.00	0.00
total inflow	**ac-ft/yr**	**22.51**	**27.24**	**31.48**	**173.23**	**0.49**	**23.27**	**37.03**	**3.37**	**11.54**	**8.20**	**81.50**	**0.69**	**1.19**	**0.82**	**2.13**	**0.02**	**129.37**	**390.52**	**462.58**	**64.74**	**51.73**
outflow	ac-ft/yr	22.51	27.24	31.48	173.23	0.49	23.27	37.03	3.37	11.54	8.20	81.50	0.69	1.19	0.82	2.13	0.02	129.37	390.52	462.58	64.74	51.73
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	27.47	5.75	5.09	179.42	0.60	28.16	16.33	3.94	9.61	9.32	27.69	0.71	1.22	0.94	2.44	0.03	148.88	168.82	81.03	77.80	60.94
upstream pond	lbs/yr	0.03	11.52	9.09	0.00	0.00	0.00	9.93	0.00	1.77	0.00	31.97	0.00	0.00	0.00	0.00	0.00	0.00	156.97	325.79	0.00	0.00
total inflow	**lbs/yr**	**27.50**	**17.27**	**14.19**	**179.42**	**0.60**	**28.16**	**26.26**	**3.94**	**11.38**	**9.32**	**59.66**	**0.71**	**1.22**	**0.94**	**2.44**	**0.03**	**148.88**	**325.79**	**406.82**	**77.80**	**60.94**
net sedimentation	lbs/yr	15.97	8.18	6.36	65.56	0.00	18.23	5.82	2.17	6.91	2.25	35.20	0.26	0.00	0.25	1.04	0.00	83.73	0.00	0.00	46.92	0.00
outflow	lbs/yr	11.52	9.09	7.82	113.86	0.60	9.93	20.43	1.77	4.47	7.07	24.46	0.45	1.22	0.69	1.41	0.03	65.15	325.79	406.82	30.88	60.94
p removal efficiency	%	58.10	47.36	44.86	36.54	0.17	64.73	22.18	54.98	60.73	24.16	59.00	36.46	0.04	26.45	42.38	2.88	56.24	0.00	0.00	60.31	0.00
upstream w-shed p load	lbs/yr	27.50	33.25	38.34	179.42	0.60	28.16	44.49	3.94	13.55	9.32	95.04	0.71	1.22	0.94	2.44	0.03	148.88	456.44	537.48	77.80	60.94
total removal %	%	58.10	72.65	79.60	36.54	0.17	64.73	54.07	54.98	67.01	24.16	74.26	36.46	0.04	26.45	42.38	2.88	56.24	28.62	24.31	60.31	0.00
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	2.35	2.43	2.86	1.24	0.10	3.33	1.02	1.62	2.88	0.57	4.77	0.95	0.10	0.44	1.03	0.10	4.61	0.10	0.10	3.37	0.10
relative volume	inches	5.13	26.51	44.93	0.74	0.00	12.03	1.03	13.33	23.71	0.40	24.01	16.77	0.00	2.04	6.83	0.02	1.99	0.00	0.00	4.46	0.00
residence time	years	0.15	0.13	0.17	0.02	0.00	0.35	0.01	0.39	0.48	0.01	0.21	0.48	0.00	0.06	0.20	0.00	0.06	0.00	0.00	0.13	0.00
residence time	days	53.98	48.62	63.71	7.77	0.01	126.80	4.04	140.53	176.96	4.21	76.82	176.83	0.00	21.52	71.98	0.16	20.94	0.00	0.00	46.98	0.00
overflow rate	ft/yr	15.86	18.22	16.39	58.27	4903.15	9.59	92.57	4.20	5.94	49.69	22.68	1.96	11936.79	7.46	5.25	230.69	80.35	3905177.10	4625782.00	26.20	517286.39
inflow phos conc	ppb	449.48	233.25	165.81	381.05	448.87	445.26	260.88	430.08	362.94	418.22	269.35	377.35	375.81	419.05	422.42	449.68	423.42	306.94	323.57	442.14	433.45
outflow phos conc	ppb	188.34	122.79	91.43	241.82	448.11	157.03	203.02	193.61	142.54	317.18	110.44	239.76	375.67	308.21	243.39	436.71	185.29	306.94	323.57	175.49	433.44
p reaction rate	-	3.31	1.71	1.48	0.91	0.00	5.20	0.37	2.71	3.94	0.42	3.51	0.90	0.00	0.49	1.28	0.03	2.94	0.00	0.00	3.83	0.00
1-rp	-	0.42	0.53	0.55	0.63	1.00	0.35	0.78	0.45	0.39	0.76	0.41	0.64	1.00	0.74	0.58	0.97	0.44	1.00	1.00	0.40	1.00
vlawmo pond volume	acre-ft	1.62	0.34	0.31	12.51	0.04	1.68	0.99	0.24	0.59	0.59	1.79	0.05	0.09	0.06	0.15	0.00	9.34	10.45	5.20	4.67	3.74
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	449.58	447.23	444.07	406.01	449.09	443.82	431.40	417.78	432.09	376.20	404.95	292.53	297.19	355.45	370.28	449.58	421.19	428.48	418.15	428.89	412.85
runoff coefficient		0.22	0.22	0.22	0.38	0.22	0.22	0.21	0.20	0.23	0.17	0.24	0.12	0.13	0.15	0.17	0.22	0.22	0.22	0.24	0.20	0.22
dissolved/total P		0.30	0.30	0.30	0.29	0.30	0.30	0.30	0.30	0.30	0.34	0.31	0.49	0.47	0.41	0.39	0.30	0.30	0.30	0.30	0.31	0.33
runoff TSS conc	ppm	140.00	140.00	140.00	145.31	140.00	141.70	145.64	152.24	142.67	165.33	146.46	187.19	183.53	168.74	163.36	140.07	145.82	144.07	143.28	147.12	150.71
POND TSS BUDGETS.....																						
runoff	lbs/yr	8530.15	1797.73	1606.21	66510.59	186.03	8889.97	5343.07	1348.06	3131.33	3361.39	9558.51	301.89	506.15	332.45	848.10	8.76	49935.12	55543.34	27591.69	25021.08	20079.46
upstream pond	lbs/yr	8.24	597.69	574.90	0.00	0.00	0.00	622.30	0.00	114.59	0.00	5208.22	0.00	0.00	0.00	0.00	0.00	0.00	25326.39	80869.73	0.00	0.00
total inflow	**lbs/yr**	**8538.39**	**2395.42**	**2181.12**	**66510.59**	**186.03**	**8889.97**	**5965.37**	**1348.06**	**3245.92**	**3361.39**	**14766.73**	**301.89**	**506.15**	**332.45**	**848.10**	**8.76**	**49935.12**	**80869.73**	**108461.42**	**25021.08**	**20079.46**
p removal efficiency (no inf)	%	59.00	48.00	45.00	37.00	0.00	65.00	23.00	55.00	61.00	25.00	59.00	37.00	0.00	27.00	43.00	3.00	57.00	0.00	0.00	61.00	0.00
tss removal efficiency (no inf)	%	93.00	76.00	70.00	63.00	0.00	93.00	45.18	91.50	93.00	49.11	93.00	63.00	0.00	53.04	68.67	5.89	93.00	0.00	0.00	93.00	0.00
net sedimentation	lbs/yr	7940.70	1820.52	1526.78	41901.67	0.00	8267.67	2695.07	1233.48	3018.70	1650.68	13733.06	190.19	0.00	176.32	582.36	0.52	46439.66	0.00	0.00	23269.61	0.00
outflow	lbs/yr	597.69	574.90	654.33	24608.92	186.03	622.30	3270.30	114.59	227.21	1710.71	1033.67	111.70	506.15	156.13	265.74	8.24	3495.46	80869.73	108461.42	1751.48	20079.46
tss removal efficiency (inf)	%	93.00	76.00	70.00	63.00	0.00	93.00	45.18	91.50	93.00	49.11	93.00	63.00	0.00	53.04	68.67	5.89	93.00	0.00	0.00	93.00	0.00
upstream watershed tss load	lbs/yr	8538.90	10336.64	11942.85	66510.59	186.03	8889.97	14233.04	1348.06	4479.40	3361.39	31632.34	301.89	506.15	332.45	848.10	8.76	49935.12	150579.00	178170.68	25021.08	20079.46
tss total removal efficiency	%	93.00	94.44	94.52	63.00	0.00	93.00	77.02	91.50	94.93	49.11	96.73	63.00	0.00	53.04	68.67	5.89	93.00	46.29	39.12	93.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**22.51**	**27.24**	**31.48**	**173.23**	**0.49**	**23.27**	**37.03**	**3.37**	**11.54**	**8.20**	**81.50**	**0.69**	**1.19**	**0.82**	**2.13**	**0.02**	**129.37**	**390.52**	**462.58**	**64.74**	**51.73**
Adjusted TP outflow	**lbs/yr**	**11.52**	**9.09**	**7.82**	**113.86**	**0.60**	**9.93**	**20.43**	**1.77**	**4.47**	**7.07**	**24.46**	**0.45**	**1.22**	**0.69**	**1.41**	**0.03**	**65.15**	**325.79**	**406.82**	**30.88**	**60.94**
Adjusted TSS outflow	**lbs/yr**	**597.69**	**574.90**	**654.33**	**24608.92**	**186.03**	**622.30**	**3270.30**	**114.59**	**227.21**	**1710.71**	**1033.67**	**111.70**	**506.15**	**156.13**	**265.74**	**8.24**	**3495.46**	**80869.73**	**108461.42**	**1751.48**	**20079.46**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS Lac Lavon Lake

		KL-4	LL-1	WVR-1	WVR-2	WVR-3	WVR-4	WVR-5	WVR-6	WVR-7	WVR-710	WVR-711	WVR-8	WVR-9	WVR-10	WVR-11	WVR-111	WVR-112	WVR-113	WVR-12	WVR-13	WVR-130
Routed TO:		WVR-46	Burnsville	WVR-2	WVR-5	WVR-5	WVR-5	WVR-17	WVR-111	WVR-711	WVR-7	WVR-LL	WVR-9	WVR-17	WVR-LL	WVR-17	WVR-17	WVR-11	WVR-112	WVR-17	WVR-17	WVR-17
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		73.7	156.2	6.6	4.2	3.2	14.8	51.7	8.4	12.2	8.4	9.2	15.4	39.2	9.5	8.5	12.2	11.3	12.4	2.4	91.0	15.4
Total watershed area (w/o wat	acres	72.2	96.4	6.3	3.7	3.1	14.8	42.8	7.4	12.2	8.4	8.1	15.2	37.9	8.9	8.2	12.0	11.3	12.3	2.2	91.0	15.4
basin area	acres	1.51	59.75	0.36	0.59	0.13	0.00	8.90	0.94	0.00	0.00	1.15	0.29	1.33	0.58	0.33	0.15	0.08	0.12	0.15	0.00	0.08
basin volume	acre-ft	4.37	0.00	0.35	0.78	0.06	0.00	26.70	1.68	0.00	0.00	2.36	0.24	2.98	0.76	0.30	0.08	0.00	0.06	0.08	0.00	0.03
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		3%	87%	100%	100%	100%	85%	75%	87%	93%	51%	14%	100%	100%	97%	58%	99%	100%	99%	13%	40%	46%
Medium Density Residential		4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	69%	1%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	41%	0%	0%	1%	0%	2%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	17%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	7%	0%	0%	0%	0%	8%	0%	7%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	18%
Open Space		0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		26%	1%	0%	0%	0%	15%	3%	13%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	17%	42%	18%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	72.21	96.44	9.26	12.92	3.10	14.76	73.58	7.44	20.65	8.44	28.73	15.16	53.05	8.91	31.76	19.47	23.56	12.31	2.22	91.02	15.35
tributary water area	ac	1.51	59.75	0.72	1.31	0.13	0.00	10.34	0.94	0.00	0.00	1.15	0.29	1.61	0.58	0.53	1.09	0.20	0.12	0.15	0.00	0.08
direct and ponded area	ac	73.72	156.19	9.99	14.23	3.23	14.76	83.92	8.38	20.65	8.44	29.88	15.44	54.66	9.49	32.29	20.56	23.76	12.43	2.37	91.02	15.43
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	369.80	425.50	450.00	450.00	449.99	442.48	431.63	443.67	436.16	351.55	277.95	449.01	449.58	449.73	408.39	449.75	449.82	449.11	441.29	416.49	387.34
runoff ortho p/total p	-	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	13.01	6.99	7.45	7.45	7.45	7.76	8.13	7.71	7.16	5.38	4.74	7.43	7.44	7.67	10.50	7.46	7.46	7.51	12.92	8.76	7.81
unit export	lbs/ac-y	1.07	0.70	0.76	0.76	0.76	0.77	0.81	0.77	0.72	0.48	0.32	0.76	0.76	0.78	0.93	0.76	0.76	0.76	1.30	0.83	0.70
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	78.27	56.17	3.89	2.27	1.92	9.55	29.01	4.78	7.28	3.78	3.19	9.38	23.49	5.69	7.18	7.47	6.99	7.71	2.39	66.42	10.00
upstream pond	ac-ft/yr	0.00	0.00	1.86	5.75	0.00	0.00	19.49	0.00	3.78	0.00	11.06	0.00	9.38	0.00	14.70	4.78	7.71	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**78.27**	**56.17**	**5.75**	**8.02**	**1.92**	**9.55**	**48.49**	**4.78**	**11.06**	**3.78**	**14.25**	**9.38**	**32.86**	**5.69**	**21.88**	**12.26**	**14.70**	**7.71**	**2.39**	**66.42**	**10.00**
outflow	ac-ft/yr	78.27	56.17	5.75	8.02	1.92	9.55	48.49	4.78	11.06	3.78	14.25	9.38	32.86	5.69	21.88	12.26	14.70	7.71	2.39	66.42	10.00
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	77.54	67.10	4.75	2.77	2.35	11.44	34.82	5.75	8.78	4.02	2.55	11.46	28.72	6.96	7.64	9.14	8.55	9.39	2.89	75.22	10.81
upstream pond	lbs/yr	0.00	0.00	1.21	3.54	0.00	0.00	16.70	0.00	4.01	0.00	12.80	0.00	7.28	0.00	15.87	2.48	7.32	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**77.54**	**67.10**	**5.96**	**6.32**	**2.35**	**11.44**	**51.52**	**5.75**	**12.80**	**4.02**	**15.34**	**11.46**	**36.00**	**6.96**	**23.51**	**11.62**	**15.87**	**9.39**	**2.89**	**75.22**	**10.81**
net sedimentation	lbs/yr	39.17	0.00	2.42	2.65	0.76	0.00	32.23	3.26	0.00	0.00	8.43	4.18	19.24	3.51	7.03	2.20	0.00	2.07	0.96	0.00	1.31
outflow	lbs/yr	38.37	67.10	3.54	3.67	1.60	11.44	19.29	2.48	12.80	4.01	6.91	7.28	16.75	3.44	16.48	9.42	15.87	7.32	1.92	75.22	9.49
p removal efficiency	%	50.51	0.00	40.58	41.99	32.09	0.01	62.55	56.76	0.01	0.02	54.94	36.46	53.46	50.47	29.90	18.90	0.00	21.99	33.32	0.00	12.15
upstream w-shed p load	lbs/yr	77.54	67.10	7.03	9.80	2.35	11.44	58.42	5.75	12.80	4.02	15.35	11.46	40.18	6.96	25.57	14.88	17.94	9.39	2.89	75.22	10.81
total removal %	%	50.51	0.00	49.59	62.62	32.09	0.01	66.97	56.76	0.01	0.02	54.95	36.46	58.30	50.47	35.57	36.68	11.52	21.99	33.32	0.00	12.15
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	2.89	0.00	0.96	1.32	0.49	0.10	3.00	1.79	0.10	0.10	2.05	0.82	2.24	1.31	0.90	0.55	0.00	0.47	0.54	0.10	0.36
relative volume	inches	1.93	0.00	3.09	11.86	1.12	0.00	31.87	12.20	0.00	0.00	25.68	0.87	4.39	4.64	1.44	0.39	0.00	0.25	1.17	0.00	0.10
residence time	years	0.06	0.00	0.06	0.10	0.03	0.00	0.55	0.35	0.00	0.00	0.17	0.03	0.09	0.13	0.01	0.01	0.00	0.01	0.03	0.00	0.00
residence time	days	20.38	0.00	22.06	35.39	11.80	0.00	200.96	128.58	0.00	0.00	60.56	9.15	33.05	48.87	5.00	2.49	0.00	2.65	12.33	0.00	1.04
overflow rate	ft/yr	51.83	0.94	15.88	13.61	15.03	95475.87	5.45	5.09	110646.23	37821.48	12.35	32.79	24.79	9.78	66.10	80.10	183.75	64.22	15.95	664212.81	124.94
inflow phos conc	ppb	364.50	439.47	381.81	290.02	450.02	440.78	390.86	442.18	425.57	390.64	396.11	449.59	402.99	449.68	395.34	348.86	397.25	448.28	443.59	416.67	397.79
outflow phos conc	ppb	180.37	439.47	226.87	168.23	305.60	440.74	146.37	191.19	425.54	390.56	178.47	285.66	187.57	222.70	277.11	282.91	397.23	349.68	295.80	416.67	349.46
p reaction rate	-	2.06	0.00	1.15	1.25	0.70	0.00	4.46	3.04	0.00	0.00	2.71	0.90	2.47	2.06	0.61	0.29	0.00	0.36	0.75	0.00	0.16
1-rp	-	0.49	1.00	0.59	0.58	0.68	1.00	0.37	0.43	1.00	1.00	0.45	0.64	0.47	0.50	0.70	0.81	1.00	0.78	0.67	1.00	0.88
vlawmo pond volume	acre-ft	5.65	4.06	0.28	0.16	0.14	0.69	2.09	0.35	0.53	0.27	0.23	0.68	1.70	0.41	0.52	0.54	0.51	0.56	0.17	4.80	0.72
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	369.80	425.50	450.00	450.00	449.99	442.48	431.63	443.67	436.16	351.55	277.95	449.01	449.58	449.73	408.39	449.75	449.82	449.11	441.29	416.49	387.34
runoff coefficient		0.38	0.20	0.22	0.22	0.22	0.22	0.23	0.22	0.21	0.16	0.14	0.21	0.21	0.22	0.30	0.22	0.22	0.22	0.37	0.25	0.23
dissolved/total P		0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	140.00	148.13	140.00	140.00	140.00	140.00	146.46	140.00	145.26	177.41	205.38	140.38	140.16	140.00	140.00	140.00	140.00	140.00	140.00	142.67	153.72
POND TSS BUDGETS.....																						
runoff	lbs/yr	29694.55	21790.14	1474.38	860.58	730.15	3622.36	11207.64	1813.84	2810.02	1666.23	1721.82	3562.37	8915.23	2159.03	2722.99	2835.99	2653.41	2923.91	907.95	25377.95	3946.46
upstream pond	lbs/yr	0.00	0.00	183.66	547.15	0.00	0.00	4369.46	0.00	1666.23	0.00	4476.25	0.00	1318.08	0.00	4313.77	126.97	1660.36	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**29694.55**	**21790.14**	**1658.04**	**1407.74**	**730.15**	**3622.36**	**15577.10**	**1813.84**	**4476.25**	**1666.23**	**6198.07**	**3562.37**	**10233.30**	**2159.03**	**7036.77**	**2962.96**	**4313.77**	**2923.91**	**907.95**	**25377.95**	**3946.46**
p removal efficiency (no inf)	%	51.00	0.00	41.00	42.00	33.00	0.00	63.00	57.00	0.00	0.00	55.00	37.00	54.00	51.00	30.00	19.00	0.00	22.00	34.00	0.00	13.00
tss removal efficiency (no inf)	%	83.00	0.00	67.00	68.00	59.38	0.00	93.00	93.00	0.00	0.00	91.50	63.00	90.00	83.00	56.75	37.32	0.00	43.21	60.25	0.00	25.54
net sedimentation	lbs/yr	24646.47	0.00	1110.88	957.26	433.53	0.00	14486.70	1686.87	0.00	0.00	5671.23	2244.29	9209.97	1791.99	3993.37	1105.82	0.00	1263.55	547.04	0.00	1007.76
outflow	lbs/yr	5048.07	21790.14	547.15	450.48	296.62	3622.36	1090.40	126.97	4476.25	1666.23	526.84	1318.08	1023.33	367.03	3043.40	1857.14	4313.77	1660.36	360.91	25377.95	2938.70
tss removal efficiency (inf)	%	83.00	0.00	67.00	68.00	59.38	0.00	93.00	93.00	0.00	0.00	91.50	63.00	90.00	83.00	56.75	37.32	0.00	43.21	60.25	0.00	25.54
upstream watershed tss load	lbs/yr	29694.55	21790.14	2180.75	3041.33	730.15	3622.36	18601.48	1813.84	4476.25	1666.23	6198.07	3562.37	12477.60	2159.03	8300.31	4649.83	5577.32	2923.91	907.95	25377.95	3946.46
tss total removal efficiency	%	83.00	0.00	74.91	85.19	59.38	0.00	94.14	93.00	0.00	0.00	91.50	63.00	91.80	83.00	63.33	60.06	22.66	43.21	60.25	0.00	25.54
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**78.27**	**56.17**	**5.75**	**8.02**	**1.92**	**9.55**	**48.49**	**4.78**	**11.06**	**3.78**	**14.25**	**9.38**	**32.86**	**5.69**	**21.88**	**12.26**	**14.70**	**7.71**	**2.39**	**66.42**	**10.00**
Adjusted TP outflow	**lbs/yr**	**38.37**	**67.10**	**3.54**	**3.67**	**1.60**	**11.44**	**19.29**	**2.48**	**12.80**	**4.01**	**6.91**	**7.28**	**16.75**	**3.44**	**16.48**	**9.42**	**15.87**	**7.32**	**1.92**	**75.22**	**9.49**
Adjusted TSS outflow	**lbs/yr**	**5048.07**	**21790.14**	**547.15**	**450.48**	**296.62**	**3622.36**	**1090.40**	**126.97**	**4476.25**	**1666.23**	**526.84**	**1318.08**	**1023.33**	**367.03**	**3043.40**	**1857.14**	**4313.77**	**1660.36**	**360.91**	**25377.95**	**2938.70**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		WVR-14	WVR-15	WVR-16	WVR-17	WVR-170	WVR-171	WVR-172	WVR-18	WVR-19	WVR-190	WVR-191	WVR-20	WVR-201	WVR-202	WVR-21	WVR-22	WVR-23	WVR-230	WVR-231	WVR-24	WVR-25
Routed TO:		WVR-LL	WVR-LL	WVR-LL	WVR-29	WVR-LL	WVR-17	WVR-171	WVR-17	WVR-21	WVR-LL	WVR-19	WVR-22	WVR-LL	WVR-LL	WVR-22	WVR-23	WVR-231	WVR-23	WVR-26	WVR-26	WVR-26
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		11.9	8.3	7.0	206.2	2.0	2.5	3.7	20.7	57.0	13.7	19.8	9.4	13.7	3.7	25.0	70.6	148.3	10.8	16.4	24.7	11.1
Total watershed area (w/o wat	acres	10.9	8.0	6.9	202.2	1.9	2.2	3.7	20.2	56.8	13.6	19.8	9.4	13.6	3.7	24.8	69.4	148.2	10.8	15.3	24.7	11.1
basin area	acres	0.92	0.37	0.09	3.98	0.11	0.27	0.00	0.53	0.18	0.10	0.03	0.00	0.07	0.04	0.20	1.27	0.12	0.00	1.12	0.00	0.00
basin volume	acre-ft	1.63	0.36	0.04	11.94	0.05	0.21	0.00	0.65	0.11	0.04	0.01	0.00	0.02	0.01	0.13	2.77	0.05	0.00	2.24	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		61%	61%	26%	64%	0%	63%	74%	89%	81%	100%	86%	100%	100%	100%	100%	92%	69%	95%	42%	100%	10%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	51%
High Density Residential		0%	0%	0%	17%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	16%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		19%	39%	74%	1%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	8%	0%	0%
Open Space		0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	34%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	16%	0%	37%	26%	11%	19%	0%	14%	0%	0%	0%	0%	4%	13%	5%	0%	0%	0%
Minnesota Zoological Gardens		19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING…….																						
tributary land area	ac	10.93	7.96	6.90	563.04	1.88	5.90	3.69	20.21	117.12	13.58	19.76	9.45	13.61	3.69	141.88	220.70	379.68	10.78	395.01	24.68	11.07
tributary water area	ac	0.92	0.37	0.09	28.85	0.11	0.27	0.00	0.53	0.52	0.10	0.03	0.00	0.07	0.04	0.72	1.99	2.11	0.00	3.22	0.00	0.00
direct and ponded area	ac	11.85	8.34	7.00	591.89	1.99	6.17	3.69	20.74	117.64	13.68	19.80	9.45	13.68	3.73	142.60	222.69	381.79	10.78	398.23	24.68	11.07
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	372.38	372.96	301.01	434.90	251.61	431.71	437.21	444.52	440.45	450.00	443.18	450.00	450.00	450.00	450.00	441.37	440.23	447.74	348.67	450.00	410.25
runoff ortho p/total p	-	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.40	0.30	0.30
unit runoff	in/yr	6.02	5.83	4.32	8.92	3.34	8.22	7.98	7.68	7.85	7.45	7.73	7.45	7.45	7.45	7.45	7.40	8.70	7.54	6.34	7.45	11.49
unit export	lbs/ac-y	0.55	0.54	0.33	0.89	0.19	0.80	0.79	0.77	0.78	0.76	0.77	0.76	0.76	0.76	0.76	0.74	0.87	0.76	0.60	0.76	1.05
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	5.48	3.87	2.48	150.35	0.52	1.51	2.46	12.93	37.13	8.42	12.74	5.86	8.44	2.29	15.36	42.78	107.41	6.78	8.09	15.32	10.59
upstream pond	ac-ft/yr	0.00	0.00	0.00	234.12	0.00	2.46	0.00	0.00	38.33	0.00	0.00	0.00	0.00	0.00	75.46	96.69	146.25	0.00	253.65	0.00	0.00
total inflow	**ac-ft/yr**	**5.48**	**3.87**	**2.48**	**384.47**	**0.52**	**3.97**	**2.46**	**12.93**	**75.46**	**8.42**	**12.74**	**5.86**	**8.44**	**2.29**	**90.83**	**139.47**	**253.65**	**6.78**	**261.75**	**15.32**	**10.59**
outflow	ac-ft/yr	5.48	3.87	2.48	384.47	0.52	3.97	2.46	12.93	75.46	8.42	12.74	5.86	8.44	2.29	90.83	139.47	253.65	6.78	261.75	15.32	10.59
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	5.98	4.28	2.28	179.47	0.36	1.76	2.90	15.57	44.24	10.30	15.29	7.17	10.33	2.80	18.79	51.68	129.11	8.24	9.20	18.74	11.60
upstream pond	lbs/yr	0.00	0.00	0.00	168.96	0.00	2.90	0.00	0.00	36.86	0.00	0.00	0.00	0.00	0.00	74.48	93.23	97.44	0.00	223.78	0.00	0.00
total inflow	**lbs/yr**	**5.98**	**4.28**	**2.28**	**348.43**	**0.36**	**4.66**	**2.90**	**15.57**	**81.10**	**10.30**	**15.29**	**7.17**	**10.33**	**2.80**	**93.27**	**144.91**	**226.55**	**8.24**	**232.98**	**18.74**	**11.60**
net sedimentation	lbs/yr	3.28	1.87	0.49	148.93	0.09	1.85	0.00	7.03	6.63	1.89	0.50	0.00	1.32	0.37	7.21	55.71	2.77	0.00	48.13	0.00	0.00
outflow	lbs/yr	2.71	2.41	1.79	199.50	0.27	2.81	2.90	8.55	74.48	8.41	14.79	7.17	9.01	2.43	86.06	89.20	223.78	8.23	184.85	18.73	11.60
p removal efficiency	%	54.77	43.68	21.38	42.74	24.84	39.76	0.03	45.12	8.17	18.35	3.26	0.01	12.75	13.33	7.73	38.44	1.22	0.01	20.66	0.01	0.01
upstream w-shed p load	lbs/yr	5.98	4.28	2.28	450.56	0.36	4.67	2.90	15.57	90.59	10.30	15.29	7.17	10.33	2.80	109.38	168.22	305.57	8.24	314.78	18.74	11.60
total removal %	%	54.77	43.68	21.38	55.72	24.84	39.78	0.03	45.12	17.78	18.35	3.26	0.01	12.75	13.33	21.32	46.97	26.77	0.01	41.28	0.01	0.01
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.77	0.98	0.39	3.00	0.44	0.79	0.10	1.23	0.61	0.42	0.19	0.10	0.33	0.22	0.65	2.18	0.46	0.10	2.00	0.10	0.10
relative volume	inches	10.32	3.27	0.49	2.75	3.26	4.89	0.00	1.75	0.10	0.17	0.02	0.00	0.09	0.13	0.29	2.24	0.02	0.00	9.57	0.00	0.00
residence time	years	0.30	0.09	0.01	0.03	0.09	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00
residence time	days	108.78	34.45	5.20	11.34	34.38	19.67	0.00	18.43	0.53	1.82	0.17	0.00	0.99	1.33	0.51	7.25	0.08	0.00	3.12	0.00	0.00
overflow rate	ft/yr	5.94	10.37	27.29	96.58	4.70	14.70	24565.33	24.39	419.23	83.41	410.86	58631.92	120.63	60.31	458.72	109.82	2167.99	67764.74	234.54	153168.56	105932.43
inflow phos conc	ppb	401.42	407.14	338.04	333.43	257.13	432.37	434.73	443.20	395.43	450.02	441.61	450.02	450.02	450.02	377.83	382.27	328.60	447.16	327.49	450.02	402.94
outflow phos conc	ppb	181.58	229.28	265.77	190.91	193.26	260.44	434.59	243.24	363.13	367.45	427.21	449.96	392.66	390.04	348.63	235.31	324.58	447.10	259.83	450.00	402.91
p reaction rate	-	2.68	1.38	0.35	1.30	0.44	1.10	0.00	1.50	0.10	0.28	0.03	0.00	0.17	0.18	0.09	1.01	0.01	0.00	0.33	0.00	0.00
1-rp	-	0.45	0.56	0.79	0.57	0.75	0.60	1.00	0.55	0.92	0.82	0.97	1.00	0.87	0.87	0.92	0.62	0.99	1.00	0.79	1.00	1.00
vlawmo pond volume	acre-ft	0.40	0.28	0.18	10.86	0.04	0.11	0.18	0.93	2.68	0.61	0.92	0.42	0.61	0.17	1.11	3.09	7.76	0.49	0.58	1.11	0.76
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	372.38	372.96	301.01	434.90	251.61	431.71	437.21	444.52	440.45	450.00	443.18	450.00	450.00	450.00	450.00	441.37	440.23	447.74	348.67	450.00	410.25
runoff coefficient		0.17	0.17	0.12	0.26	0.10	0.24	0.23	0.22	0.23	0.22	0.22	0.22	0.22	0.22	0.22	0.21	0.25	0.22	0.18	0.22	0.33
dissolved/total P		0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.40	0.30	0.30
runoff TSS conc	ppm	169.50	169.28	196.61	142.10	215.39	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00	142.47	141.00	140.00	172.00	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	2354.63	1637.84	1228.47	57242.88	301.54	573.82	932.01	4904.84	14087.52	3196.17	4832.30	2224.50	3203.70	869.53	5829.11	16356.25	40809.25	2571.00	3292.69	5811.22	4019.08
upstream pond	lbs/yr	0.00	0.00	0.00	38230.52	0.00	932.01	0.00	0.00	8737.30	0.00	0.00	0.00	0.00	0.00	18789.72	22974.66	16336.82	0.00	54901.04	0.00	0.00
total inflow	**lbs/yr**	**2354.63**	**1637.84**	**1228.47**	**95473.40**	**301.54**	**1505.83**	**932.01**	**4904.84**	**22824.82**	**3196.17**	**4832.30**	**2224.50**	**3203.70**	**869.53**	**24618.83**	**39330.91**	**57146.07**	**2571.00**	**58193.73**	**5811.22**	**4019.08**
p removal efficiency (no inf)	%	55.00	44.00	22.00	43.00	25.00	40.00	0.00	46.00	9.00	19.00	4.00	0.00	13.00	14.00	8.00	39.00	2.00	0.00	21.00	0.00	0.00
tss removal efficiency (no inf)	%	91.50	69.33	43.21	68.67	49.11	66.00	0.00	72.00	17.68	37.32	7.86	0.00	25.54	27.50	15.71	65.00	3.93	0.00	41.25	0.00	0.00
net sedimentation	lbs/yr	2154.48	1135.57	530.87	65558.40	148.08	993.85	0.00	3531.49	4035.10	1192.85	379.68	0.00	818.09	239.12	3868.67	25565.09	2245.02	0.00	24004.91	0.00	0.00
outflow	lbs/yr	200.14	502.27	697.59	29915.00	153.46	511.98	932.01	1373.36	18789.72	2003.31	4452.62	2224.50	2385.61	630.41	20750.16	13765.82	54901.04	2571.00	34188.82	5811.22	4019.08
tss removal efficiency (inf)	%	91.50	69.33	43.21	68.67	49.11	66.00	0.00	72.00	17.68	37.32	7.86	0.00	25.54	27.50	15.71	65.00	3.93	0.00	41.25	0.00	0.00
upstream watershed tss load	lbs/yr	2354.63	1637.84	1228.47	148485.03	301.54	1505.83	932.01	4904.84	28630.15	3196.17	4832.30	2224.50	3203.70	869.53	34459.26	53040.01	96420.26	2571.00	99712.95	5811.22	4019.08
tss total removal efficiency	%	91.50	69.33	43.21	79.85	49.11	66.00	0.00	72.00	34.37	37.32	7.86	0.00	25.54	27.50	39.78	74.05	43.06	0.00	65.71	0.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**5.48**	**3.87**	**2.48**	**384.47**	**0.52**	**3.97**	**2.46**	**12.93**	**75.46**	**8.42**	**12.74**	**5.86**	**8.44**	**2.29**	**90.83**	**139.47**	**253.65**	**6.78**	**261.75**	**15.32**	**10.59**
Adjusted TP outflow	**lbs/yr**	**2.71**	**2.41**	**1.79**	**199.50**	**0.27**	**2.81**	**2.90**	**8.55**	**74.48**	**8.41**	**14.79**	**7.17**	**9.01**	**2.43**	**86.06**	**89.20**	**223.78**	**8.23**	**184.85**	**18.73**	**11.60**
Adjusted TSS outflow	**lbs/yr**	**200.14**	**502.27**	**697.59**	**29915.00**	**153.46**	**511.98**	**932.01**	**1373.36**	**18789.72**	**2003.31**	**4452.62**	**2224.50**	**2385.61**	**630.41**	**20750.16**	**13765.82**	**54901.04**	**2571.00**	**34188.82**	**5811.22**	**4019.08**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		WVR-26	WVR-27	WVR-28	WVR-280	WVR-281	WVR-29	WVR-290	WVR-291	WVR-292	WVR-30	WVR-31	WVR-32	WVR-320	WVR-321	WVR-322	WVR-33	WVR-34	WVR-35	WVR-36	WVR-37	WVR-370
Routed TO:		WVR-28	WVR-28	WVR-443	WVR-28	WVR-280	WVR-33	WVR-29	WVR-29	WVR-LL	WVR-17	WVR-33	WVR-321	WVR-321	WVR-280	WVR-280	WVR-36	WVR-36	WVR-36	WVR-28	WVR-38	WVR-LL
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		170.6	56.2	547.3	161.0	21.1	52.9	8.4	4.7	4.1	16.9	23.7	4.6	5.1	64.6	3.7	63.7	2.6	17.4	186.5	12.3	3.2
Total watershed area (w/o wat	acres	169.6	54.5	540.5	154.5	21.0	51.8	8.4	4.7	4.0	15.9	23.7	4.6	4.5	61.6	3.6	62.7	2.6	17.4	183.7	12.3	3.2
basin area	acres	1.03	1.66	6.75	6.51	0.14	1.15	0.00	0.00	0.10	1.00	0.00	0.00	0.52	3.00	0.13	0.96	0.08	0.00	2.77	0.00	0.00
basin volume	acre-ft	1.96	5.17	22.84	23.77	0.07	2.35	0.00	0.00	0.04	1.87	0.00	0.00	2.13	18.57	0.06	1.74	0.00	0.00	10.05	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		53%	39%	26%	88%	98%	19%	46%	48%	93%	84%	44%	100%	100%	85%	98%	84%	100%	100%	80%	82%	100%
Medium Density Residential		15%	7%	2%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		5%	0%	4%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		9%	50%	46%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		3%	0%	6%	0%	0%	0%	0%	0%	0%	2%	56%	0%	0%	0%	0%	15%	0%	0%	4%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		5%	0%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%
Open Space		1%	4%	4%	0%	1%	0%	0%	0%	0%	10%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		10%	0%	9%	0%	1%	56%	54%	52%	7%	3%	0%	0%	0%	0%	2%	1%	0%	0%	4%	18%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING…….																						
tributary land area	ac	600.34	874.35	3578.29	645.04	20.99	627.90	8.37	4.73	4.03	15.92	23.70	4.65	4.54	70.77	3.57	714.31	2.57	17.42	918.04	12.31	3.21
tributary water area	ac	4.25	58.56	120.21	16.84	0.14	30.00	0.00	0.00	0.10	1.00	0.00	0.00	0.52	3.52	0.13	30.96	0.08	0.00	33.80	0.00	0.00
direct and ponded area	ac	604.60	932.91	3698.49	661.88	21.12	657.90	8.37	4.73	4.13	16.92	23.70	4.65	5.06	74.29	3.70	745.27	2.65	17.42	951.84	12.31	3.21
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	421.18	389.84	378.29	435.47	446.83	421.78	423.00	424.18	446.44	420.71	393.63	450.00	450.00	412.71	449.20	434.36	449.99	450.00	420.68	440.78	450.00
runoff ortho p/total p	-	0.30	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.34	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	9.05	11.09	11.30	7.64	7.41	9.41	8.58	8.53	7.60	7.04	9.82	7.45	7.45	6.60	7.48	8.10	7.45	7.45	7.21	7.83	7.45
unit export	lbs/ac-y	0.87	0.96	0.96	0.76	0.75	0.90	0.82	0.81	0.77	0.70	0.85	0.76	0.76	0.66	0.76	0.79	0.76	0.76	0.70	0.78	0.76
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	127.88	50.37	508.98	98.39	12.97	40.60	5.99	3.36	2.55	9.34	19.38	2.88	2.82	33.89	2.23	42.35	1.59	10.81	110.40	8.04	1.99
upstream pond	ac-ft/yr	287.66	534.15	2087.73	370.34	0.00	393.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.70	0.00	453.80	0.00	0.00	508.55	0.00	0.00
total inflow	**ac-ft/yr**	**415.53**	**584.52**	**2596.72**	**468.72**	**12.97**	**434.41**	**5.99**	**3.36**	**2.55**	**9.34**	**19.38**	**2.88**	**2.82**	**39.59**	**2.23**	**496.15**	**1.59**	**10.81**	**618.95**	**8.04**	**1.99**
outflow	ac-ft/yr	415.53	584.52	2596.72	468.72	12.97	434.41	5.99	3.36	2.55	9.34	19.38	2.88	2.82	39.59	2.23	496.15	1.59	10.81	618.95	8.04	1.99
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	146.81	52.31	521.41	117.47	15.81	46.50	6.83	3.85	3.09	11.11	20.18	3.53	3.44	40.53	2.72	49.24	1.95	13.22	129.20	9.58	2.44
upstream pond	lbs/yr	215.19	275.03	992.40	124.43	0.00	210.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.60	0.00	239.85	0.00	0.00	274.16	0.00	0.00
total inflow	**lbs/yr**	**362.00**	**327.35**	**1513.81**	**241.89**	**15.81**	**256.67**	**6.83**	**3.85**	**3.09**	**11.11**	**20.18**	**3.53**	**3.44**	**45.13**	**2.72**	**289.08**	**1.95**	**13.22**	**403.37**	**9.58**	**2.44**
net sedimentation	lbs/yr	62.48	62.33	296.37	97.05	3.13	37.01	0.00	0.00	0.82	6.04	0.00	0.00	2.37	31.34	0.86	30.09	0.00	0.00	120.34	0.00	0.00
outflow	lbs/yr	299.52	265.02	1217.44	144.84	12.68	219.66	6.83	3.85	2.26	5.07	20.18	3.52	1.08	13.79	1.86	258.99	1.95	13.22	283.03	9.58	2.44
p removal efficiency	%	17.26	19.04	19.58	40.12	19.79	14.42	0.01	0.02	26.72	54.38	0.00	0.03	68.71	69.44	31.64	10.41	0.02	0.01	29.83	0.01	0.04
upstream w-shed p load	lbs/yr	491.93	658.44	2883.15	489.84	15.81	507.74	6.83	3.85	3.09	11.11	20.18	3.53	3.44	47.50	2.72	577.16	1.95	13.22	721.53	9.58	2.44
total removal %	%	39.11	59.75	57.77	70.43	19.79	56.74	0.01	0.02	26.72	54.38	0.00	0.03	68.71	70.96	31.64	55.13	0.02	0.01	60.77	0.01	0.04
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	1.90	3.11	3.38	3.65	0.51	2.04	0.10	0.10	0.41	1.87	0.10	0.10	4.10	6.19	0.49	1.82	0.00	0.10	3.63	0.10	0.10
relative volume	inches	0.53	3.55	1.55	8.36	0.19	2.00	0.00	0.00	0.56	6.91	0.00	0.00	26.19	18.97	0.99	1.43	0.00	0.00	3.15	0.00	0.00
residence time	years	0.00	0.01	0.01	0.05	0.01	0.01	0.00	0.00	0.02	0.20	0.00	0.00	0.76	0.47	0.03	0.00	0.00	0.00	0.02	0.00	0.00
residence time	days	1.72	3.23	3.21	18.51	1.98	1.98	0.00	0.00	5.92	72.89	0.00	0.00	276.12	171.19	10.46	1.28	0.00	0.00	5.93	0.00	0.00
overflow rate	ft/yr	403.43	352.12	384.70	72.00	93.95	377.75	59855.82	33644.23	25.49	9.34	193821.42	28826.25	5.41	13.20	17.13	516.82	20.71	108097.04	223.69	80365.83	19927.37
inflow phos conc	ppb	320.52	206.04	214.49	189.87	448.57	217.38	419.98	421.13	445.56	437.54	383.12	450.02	450.02	419.40	449.00	214.37	450.02	450.02	239.77	438.79	450.02
outflow phos conc	ppb	265.20	166.81	172.49	113.69	359.81	186.04	419.93	421.03	326.50	199.59	383.11	449.89	140.82	128.18	306.92	192.05	449.94	449.99	168.24	438.75	449.83
p reaction rate	-	0.25	0.29	0.30	1.12	0.31	0.20	0.00	0.00	0.50	2.61	0.00	0.00	7.02	7.43	0.68	0.13	0.00	0.00	0.61	0.00	0.00
1-rp	-	0.83	0.81	0.80	0.60	0.80	0.86	1.00	1.00	0.73	0.46	1.00	1.00	0.31	0.31	0.68	0.90	1.00	1.00	0.70	1.00	1.00
vlawmo pond volume	acre-ft	9.23	3.64	36.76	7.10	0.94	2.93	0.43	0.24	0.18	0.67	1.40	0.21	0.20	2.45	0.16	3.06	0.12	0.78	7.97	0.58	0.14
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	421.18	389.84	378.29	435.47	446.83	421.78	423.00	424.18	446.44	420.71	393.63	450.00	450.00	412.71	449.20	434.36	449.99	450.00	420.68	440.78	450.00
runoff coefficient		0.26	0.32	0.33	0.22	0.21	0.27	0.25	0.25	0.22	0.20	0.28	0.22	0.22	0.19	0.22	0.23	0.22	0.22	0.21	0.23	0.22
dissolved/total P		0.30	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.34	0.30	0.30	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	144.38	143.19	144.94	144.37	140.78	140.00	140.00	140.00	140.00	147.65	140.00	140.00	140.00	151.32	140.00	140.00	140.00	140.00	148.78	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	49018.55	19179.19	194436.49	37821.24	4925.39	15402.09	2270.93	1276.47	966.93	3592.31	7353.59	1093.67	1068.24	13134.63	845.06	16068.83	604.89	4101.20	43051.20	3049.08	756.05
upstream pond	lbs/yr	44019.11	49003.38	157535.29	9797.44	0.00	33462.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1168.45	0.00	41820.50	0.00	0.00	50087.20	0.00	0.00
total inflow	**lbs/yr**	**93037.67**	**68182.57**	**351971.79**	**47618.69**	**4925.39**	**48864.49**	**2270.93**	**1276.47**	**966.93**	**3592.31**	**7353.59**	**1093.67**	**1068.24**	**14303.07**	**845.06**	**57889.33**	**604.89**	**4101.20**	**93138.40**	**3049.08**	**756.05**
p removal efficiency (no inf)	%	18.00	20.00	20.00	41.00	20.00	15.00	0.00	0.00	27.00	55.00	0.00	0.00	69.00	70.00	32.00	11.00	0.00	0.00	30.00	0.00	0.00
tss removal efficiency (no inf)	%	35.36	39.29	39.29	67.00	39.29	29.46	0.00	0.00	53.04	91.50	0.00	0.00	93.00	93.00	58.50	21.61	0.00	0.00	56.75	0.00	0.00
net sedimentation	lbs/yr	32895.46	26786.01	138274.63	31904.52	1934.98	14397.57	0.00	0.00	512.82	3286.96	0.00	0.00	993.47	13301.86	494.36	12508.23	0.00	0.00	52856.04	0.00	0.00
outflow	lbs/yr	60142.21	41396.56	213697.16	15714.17	2990.42	34466.92	2270.93	1276.47	454.11	305.35	7353.59	1093.67	74.78	1001.22	350.70	45381.10	604.89	4101.20	40282.36	3049.08	756.05
tss removal efficiency (inf)	%	35.36	39.29	39.29	67.00	39.29	29.46	0.00	0.00	53.04	91.50	0.00	0.00	93.00	93.00	58.50	21.61	0.00	0.00	56.75	0.00	0.00
upstream watershed tss load	lbs/yr	158561.80	226921.91	1004930.22	186395.77	4925.39	167434.53	2270.93	1276.47	966.93	3592.31	7353.59	1093.67	1068.24	15296.54	845.06	190856.94	604.89	4101.20	238614.24	3049.08	756.05
tss total removal efficiency	%	62.07	81.76	78.74	91.57	39.29	79.41	0.00	0.00	53.04	91.50	0.00	0.00	93.00	93.45	58.50	76.22	0.00	0.00	83.12	0.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**415.53**	**584.52**	**2596.72**	**468.72**	**12.97**	**434.41**	**5.99**	**3.36**	**2.55**	**9.34**	**19.38**	**2.88**	**2.82**	**39.59**	**2.23**	**496.15**	**1.59**	**10.81**	**618.95**	**8.04**	**1.99**
Adjusted TP outflow	**lbs/yr**	**299.52**	**265.02**	**1217.44**	**144.84**	**12.68**	**219.66**	**6.83**	**3.85**	**2.26**	**5.07**	**20.18**	**3.52**	**1.08**	**13.79**	**1.86**	**258.99**	**1.95**	**13.22**	**283.03**	**9.58**	**2.44**
Adjusted TSS outflow	**lbs/yr**	**60142.21**	**41396.56**	**213697.16**	**15714.17**	**2990.42**	**34466.92**	**2270.93**	**1276.47**	**454.11**	**305.35**	**7353.59**	**1093.67**	**74.78**	**1001.22**	**350.70**	**45381.10**	**604.89**	**4101.20**	**40282.36**	**3049.08**	**756.05**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		WVR-38	WVR-40	WVR-41	WVR-42	WVR-4333	WVR-4334	WVR-4335	WVR-4336	WVR-4337	WVR-4338	WVR-44	WVR-440	WVR-441	WVR-4410	WVR-4411	WVR-442	WVR-4420	WVR-4421	WVR-4422	WVR-4423	WVR-443
Routed TO:		WVR-19	WVR-41	WVR-27	WVR-27	WVR-443	WVR-4333	WVR-4333	WVR-4335	WVR-4335	WVR-443	WVR-443	WVR-4410	WVR-443	WVR-441	WVR-441	WVR-443	WVR-442	WVR-442	WVR-442	WVR-4422	Lakeville
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		28.6	277.5	70.1	68.4	12.7	9.0	8.4	6.1	20.5	22.9	92.4	14.6	24.8	5.4	20.2	50.1	17.1	52.6	11.5	16.0	163.5
Total watershed area (w/o wat	acres	28.3	273.8	69.2	67.7	11.7	8.6	8.0	5.7	20.2	22.9	91.3	13.6	24.1	5.1	19.0	49.2	17.0	51.0	11.4	15.8	157.7
basin area	acres	0.31	3.67	0.94	0.70	1.00	0.44	0.43	0.36	0.36	0.00	1.08	1.05	0.68	0.37	1.24	0.97	0.09	1.61	0.11	0.19	5.75
basin volume	acre-ft	0.27	12.82	2.03	1.03	1.87	0.48	0.46	0.34	0.34	0.00	3.45	4.22	1.41	0.82	8.46	4.69	0.21	5.67	0.24	0.59	20.48
Row Crop Agriculture		0%	0%	0%	0%	2%	4%	0%	0%	0%	88%	0%	24%	4%	0%	0%	0%	0%	0%	0%	0%	33%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Pits and Quarries		0%	0%	0%	0%	4%	8%	0%	0%	0%	11%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	15%
Low Density Residential		100%	61%	69%	49%	50%	39%	100%	100%	96%	0%	8%	59%	72%	100%	0%	11%	30%	0%	32%	41%	30%
Medium Density Residential		0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	0%	15%	0%	27%	23%	70%	79%	58%	59%	1%
High Density Residential		0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	0%	0%	10%	0%	0%
Neighborhood Services		0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	81%	9%	9%	0%	72%	1%	0%	21%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	28%	31%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	4%	0%	14%	40%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	2%	0%	13%	0%	0%	0%	0%	0%	0%	11%	1%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																						
tributary land area	ac	40.58	682.96	752.15	67.70	54.14	8.56	33.88	5.70	20.19	22.90	91.28	13.58	61.74	18.66	19.00	144.39	17.01	51.02	27.18	15.83	5112.38
tributary water area	ac	0.31	55.26	56.20	0.70	2.59	0.44	1.15	0.36	0.36	0.00	1.08	1.05	3.34	1.42	1.24	2.97	0.09	1.61	0.30	0.19	150.16
direct and ponded area	ac	40.89	738.22	808.35	68.40	56.73	9.00	35.03	6.06	20.55	22.90	92.36	14.63	65.08	20.08	20.24	147.36	17.10	52.63	27.48	16.02	5262.54
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	449.88	407.47	418.82	392.20	340.76	319.23	450.00	450.00	450.11	478.08	363.25	432.47	445.11	450.00	377.54	448.49	450.00	429.13	450.00	450.00	389.96
runoff ortho p/total p	-	0.30	0.31	0.30	0.30	0.30	0.27	0.30	0.30	0.30	0.18	0.30	0.26	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.24
unit runoff	in/yr	7.45	8.60	8.76	8.76	5.15	4.67	7.45	7.45	7.57	4.31	13.65	6.98	8.45	7.45	13.65	12.98	9.66	11.47	9.99	9.31	5.39
unit export	lbs/ac-y	0.76	0.79	0.81	0.78	0.46	0.41	0.76	0.76	0.77	0.53	1.11	0.71	0.84	0.76	1.15	1.32	0.98	1.10	1.02	0.95	0.56
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	17.56	196.12	50.49	49.40	5.02	3.34	4.96	3.54	12.73	8.21	103.85	7.90	16.96	3.15	21.62	53.19	13.69	48.78	9.45	12.28	70.88
upstream pond	ac-ft/yr	8.04	238.13	434.25	0.00	24.57	0.00	16.27	0.00	0.00	0.00	0.00	0.00	32.67	7.90	0.00	84.20	0.00	0.00	12.28	0.00	3506.17
total inflow	**ac-ft/yr**	**25.59**	**434.25**	**484.75**	**49.40**	**29.58**	**3.34**	**21.23**	**3.54**	**12.73**	**8.21**	**103.85**	**7.90**	**49.62**	**11.05**	**21.62**	**137.39**	**13.69**	**48.78**	**21.73**	**12.28**	**3577.05**
outflow	ac-ft/yr	25.59	434.25	484.75	49.40	29.58	3.34	21.23	3.54	12.73	8.21	103.85	7.90	49.62	11.05	21.62	137.39	13.69	48.78	21.73	12.28	3577.05
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	21.47	217.16	56.07	53.01	5.42	3.49	6.07	4.33	15.58	12.04	101.09	9.57	20.14	3.85	21.82	64.83	16.74	56.10	11.55	15.02	88.52
upstream pond	lbs/yr	9.58	158.17	217.67	0.00	14.19	0.00	11.95	0.00	0.00	0.00	0.00	0.00	10.45	2.89	0.00	46.19	0.00	0.00	7.05	0.00	1659.16
total inflow	**lbs/yr**	**31.05**	**375.33**	**273.74**	**53.01**	**19.61**	**3.49**	**18.02**	**4.33**	**15.58**	**12.04**	**101.09**	**9.57**	**30.59**	**6.74**	**21.82**	**111.02**	**16.74**	**56.10**	**18.60**	**15.02**	**1747.68**
net sedimentation	lbs/yr	8.98	157.65	31.97	19.74	8.01	1.64	5.69	1.95	6.00	0.00	45.95	6.69	10.29	2.84	15.27	49.45	6.40	33.69	5.17	7.97	277.80
outflow	lbs/yr	22.07	217.67	241.76	33.27	11.59	1.85	12.34	2.37	9.58	12.04	55.14	2.89	20.30	3.90	6.56	61.57	10.34	22.41	13.44	7.05	1469.88
p removal efficiency	%	28.92	42.00	11.68	37.24	40.88	47.00	31.55	45.17	38.49	0.02	45.45	69.85	33.64	42.20	69.95	44.54	38.22	60.05	27.76	53.07	15.90
upstream w-shed p load	lbs/yr	31.05	497.05	553.11	53.01	34.88	3.49	25.97	4.33	15.58	12.04	101.09	9.57	55.39	13.43	21.82	164.25	16.74	56.10	26.58	15.02	3976.45
total removal %	%	28.92	56.21	56.29	37.24	66.77	47.00	52.50	45.17	38.49	0.02	45.45	69.85	63.35	70.99	69.95	62.51	38.22	60.05	49.43	53.07	63.04
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.87	3.49	2.16	1.47	1.87	1.09	1.07	0.96	0.96	0.10	3.19	4.02	2.07	2.22	6.82	4.84	2.33	3.52	2.18	3.11	3.56
relative volume	inches	0.53	2.26	1.39	0.72	12.87	4.98	3.22	3.37	0.94	0.00	1.15	18.50	2.88	9.01	13.55	3.05	0.53	4.02	0.88	1.66	10.00
residence time	years	0.01	0.03	0.00	0.02	0.06	0.14	0.02	0.10	0.03	0.00	0.03	0.53	0.03	0.07	0.39	0.03	0.02	0.12	0.01	0.05	0.01
residence time	days	3.83	10.78	1.53	7.59	23.02	52.50	7.94	35.51	9.87	0.00	12.13	195.00	10.37	27.09	142.85	12.46	5.60	42.43	4.03	17.54	2.09
overflow rate	ft/yr	82.56	118.33	515.69	70.88	29.58	7.58	49.38	9.83	35.37	82149.48	96.16	7.52	72.98	29.86	17.43	141.64	152.09	30.30	197.52	64.64	622.10
inflow phos conc	ppb	446.38	317.99	207.76	394.76	243.81	384.91	312.30	450.02	450.09	539.16	358.14	445.91	226.83	224.42	371.44	297.31	450.02	423.12	315.03	450.02	179.76
outflow phos conc	ppb	317.28	184.42	183.50	247.76	144.14	203.99	213.79	246.74	276.86	539.05	195.35	134.43	150.53	129.71	111.61	164.88	278.02	169.03	227.57	211.20	151.18
p reaction rate	-	0.57	1.25	0.15	0.95	1.17	1.67	0.67	1.50	1.02	0.00	1.53	7.69	0.76	1.26	7.75	1.45	1.00	3.76	0.53	2.41	0.22
1-rp	-	0.71	0.58	0.88	0.63	0.59	0.53	0.68	0.55	0.62	1.00	0.55	0.30	0.66	0.58	0.30	0.55	0.62	0.40	0.72	0.47	0.84
vlawmo pond volume	acre-ft	1.27	14.16	3.65	3.57	0.36	0.24	0.36	0.26	0.92	0.59	7.50	0.57	1.22	0.23	1.56	3.84	0.99	3.52	0.68	0.89	5.12
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	449.88	407.47	418.82	392.20	340.76	319.23	450.00	450.00	450.11	478.08	363.25	432.47	445.11	450.00	377.54	448.49	450.00	429.13	450.00	450.00	389.96
runoff coefficient		0.22	0.25	0.25	0.25	0.15	0.14	0.22	0.22	0.22	0.12	0.39	0.20	0.24	0.22	0.39	0.37	0.28	0.33	0.29	0.27	0.16
dissolved/total P		0.30	0.31	0.30	0.30	0.30	0.27	0.30	0.30	0.30	0.18	0.30	0.26	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.24
runoff TSS conc	ppm	140.00	144.82	140.00	150.75	167.82	167.90	140.00	140.00	140.03	144.49	140.00	136.21	140.98	140.00	140.00	140.00	140.00	140.00	140.00	140.00	131.70
POND TSS BUDGETS.....																						
runoff	lbs/yr	6661.24	75197.33	19156.22	19271.86	2184.58	1509.94	1882.40	1342.06	4831.50	3626.39	39401.22	3080.62	6459.87	1195.38	8201.01	20181.03	5193.41	18507.31	3583.90	4659.44	28664.87
upstream pond	lbs/yr	3049.08	39322.16	35882.77	0.00	2001.31	0.00	2066.80	0.00	0.00	0.00	0.00	0.00	1016.19	215.64	0.00	4935.64	0.00	0.00	465.94	0.00	284136.01
total inflow	**lbs/yr**	**9710.32**	**114519.49**	**55038.99**	**19271.86**	**4185.88**	**1509.94**	**3949.20**	**1342.06**	**4831.50**	**3626.39**	**39401.22**	**3080.62**	**7476.06**	**1411.03**	**8201.01**	**25116.66**	**5193.41**	**18507.31**	**4049.84**	**4659.44**	**312800.88**
p removal efficiency (no inf)	%	29.00	43.00	12.00	38.00	41.00	48.00	32.00	46.00	39.00	0.00	46.00	70.00	34.00	43.00	70.00	45.00	39.00	61.00	28.00	54.00	16.00
tss removal efficiency (no inf)	%	55.88	68.67	23.57	64.00	67.00	76.00	58.50	72.00	65.00	0.00	72.00	93.00	60.25	68.67	93.00	70.00	65.00	93.00	55.00	90.00	31.43
net sedimentation	lbs/yr	5425.64	78636.72	12973.48	12333.99	2804.54	1147.55	2310.28	966.28	3140.48	0.00	28368.88	2864.97	4504.33	968.90	7626.94	17581.66	3375.72	17211.80	2227.41	4193.49	98308.85
outflow	lbs/yr	4284.68	35882.77	42065.51	6937.87	1381.34	362.39	1638.92	375.78	1691.03	3626.39	11032.34	215.64	2971.73	442.12	574.07	7535.00	1817.69	1295.51	1822.43	465.94	214492.04
tss removal efficiency (inf)	%	55.88	68.67	23.57	64.00	67.00	76.00	58.50	72.00	65.00	0.00	72.00	93.00	60.25	68.67	93.00	70.00	65.00	93.00	55.00	90.00	31.43
upstream watershed tss load	lbs/yr	9710.32	169314.65	188470.87	19271.86	11750.49	1509.94	8055.97	1342.06	4831.50	3626.39	39401.22	3080.62	18936.88	4276.00	8201.01	52125.09	5193.41	18507.31	8243.34	4659.44	1383686.81
tss total removal efficiency	%	55.88	78.81	77.68	64.00	88.24	76.00	79.66	72.00	65.00	0.00	72.00	93.00	84.31	89.66	93.00	85.54	65.00	93.00	77.89	90.00	84.50
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**25.59**	**434.25**	**484.75**	**49.40**	**29.58**	**3.34**	**21.23**	**3.54**	**12.73**	**8.21**	**103.85**	**7.90**	**49.62**	**11.05**	**21.62**	**137.39**	**13.69**	**48.78**	**21.73**	**12.28**	**3577.05**
Adjusted TP outflow	**lbs/yr**	**22.07**	**217.67**	**241.76**	**33.27**	**11.59**	**1.85**	**12.34**	**2.37**	**9.58**	**12.04**	**55.14**	**2.89**	**20.30**	**3.90**	**6.56**	**61.57**	**10.34**	**22.41**	**13.44**	**7.05**	**1469.88**
Adjusted TSS outflow	**lbs/yr**	**4284.68**	**35882.77**	**42065.51**	**6937.87**	**1381.34**	**362.39**	**1638.92**	**375.78**	**1691.03**	**3626.39**	**11032.34**	**215.64**	**2971.73**	**442.12**	**574.07**	**7535.00**	**1817.69**	**1295.51**	**1822.43**	**465.94**	**214492.04**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		WVR-4430	WVR-4431	WVR-4432	WVR-45	WVR-46	WVR-47	WVR-48	WVR-49	WVR-50	WVR-52	WVR-53	WVR-54	WVR-55	WVR-56	WVR-560	WVR-57	WVR-58	WVR-59	WVR-590	WVR-60	exit 1
Routed TO:		WVR-443	WVR-443	WVR-443	WVR-443	WVR-50	WVR-50	WVR-50	WVR-47	WVR-443	WVR-53	WVR-54	WVR-443	WVR-56	WVR-280	WVR-56	WVR-56	WVR-17	WVR-17	WVR-59	WVR-1	Lakeville
INPUT VARIABLES....	UNITS																					
case label	-																					
Total watershed area		26.7	3.4	1.3	211.2	56.7	97.4	14.1	30.2	117.3	136.0	141.7	106.3	130.1	171.5	80.3	19.8	4.3	15.3	22.1	3.4	4.2
Total watershed area (w/o wat	acres	26.7	3.0	1.0	207.0	54.9	96.7	13.5	30.0	112.9	136.0	141.7	106.3	129.1	167.0	79.3	19.8	3.4	10.9	18.1	3.0	4.2
basin area	acres	0.00	0.44	0.37	4.17	1.81	0.69	0.57	0.26	4.41	0.00	0.00	0.00	0.99	4.53	1.02	0.00	0.95	4.31	4.00	0.36	0.00
basin volume	acre-ft	0.00	0.47	0.82	27.13	9.58	2.57	0.28	0.20	10.75	0.00	0.00	0.00	3.97	32.36	1.94	0.00	1.71	12.93	8.00	0.35	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	37%	0%	17%	21%	0%	0%	0%	0%	0%	0%	0%
Farmstead		11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		85%	0%	0%	0%	0%	0%	0%	0%	0%	73%	55%	97%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	100%	100%	4%	5%	38%	0%	90%	58%	0%	0%	0%	0%	0%	16%	4%	0%	47%	13%	100%	0%
Medium Density Residential		0%	0%	0%	0%	46%	47%	100%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	15%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	64%	10%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	62%	8%	0%	96%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	29%	0%	0%	0%	0%	0%	3%	0%	0%	36%	28%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	34%	56%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	12%	0%	15%	0%	9%	0%	0%	0%	1%	16%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		4%	0%	0%	5%	10%	0%	0%	2%	17%	2%	5%	1%	4%	0%	0%	0%	0%	0%	0%	0%	100%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	53%	87%	0%	0%
WATERSHED-WIDE ACCOUNTING…….																						
tributary land area	ac	26.71	2.98	0.96	207.01	127.13	126.66	13.54	29.95	380.27	136.00	277.67	383.97	129.15	395.26	79.28	19.83	3.36	29.01	18.07	3.00	4.23
tributary water area	ac	0.00	0.44	0.37	4.17	3.32	0.95	0.57	0.26	9.25	0.00	0.00	0.00	0.99	6.54	1.02	0.00	0.95	8.31	4.00	0.36	0.00
direct and ponded area	ac	26.71	3.42	1.33	211.18	130.45	127.61	14.11	30.21	389.52	136.00	277.67	383.97	130.14	401.80	80.30	19.83	4.31	37.32	22.07	3.36	4.23
ASSUMED EXPORT FACTORS.....																						
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	53.24	449.99	449.98	353.32	405.53	412.84	450.00	427.14	429.29	143.65	231.90	7.27	361.15	354.68	310.84	353.66	250.00	344.73	276.43	449.99	400.00
runoff ortho p/total p	-	0.07	0.30	0.30	0.34	0.30	0.34	0.30	0.33	0.30	0.06	0.10	0.01	0.33	0.28	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.71	7.45	7.45	12.72	11.08	8.09	10.60	6.98	9.02	1.40	2.70	0.13	12.73	7.77	6.26	17.57	4.29	5.79	4.71	7.45	9.55
unit export	lbs/ac-y	0.06	0.76	0.76	1.06	1.01	0.81	1.08	0.70	0.88	0.17	0.30	0.01	1.04	0.63	0.48	1.40	0.24	0.49	0.31	0.76	0.87
POND WATER BUDGETS.....																						
runoff	ac-ft/yr	1.58	1.85	0.60	219.48	50.69	65.19	11.96	17.41	84.90	15.89	31.87	1.11	137.04	108.10	41.37	29.04	1.20	5.28	7.09	1.86	3.37
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	78.27	17.41	0.00	0.00	223.52	0.00	15.89	47.76	0.00	207.46	0.00	0.00	0.00	7.09	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**1.58**	**1.85**	**0.60**	**219.48**	**128.96**	**82.60**	**11.96**	**17.41**	**308.43**	**15.89**	**47.76**	**48.87**	**137.04**	**315.55**	**41.37**	**29.04**	**1.20**	**12.37**	**7.09**	**1.86**	**3.37**
outflow	ac-ft/yr	1.58	1.85	0.60	219.48	128.96	82.60	11.96	17.41	308.43	15.89	47.76	48.87	137.04	315.55	41.37	29.04	1.20	12.37	7.09	1.86	3.37
POND PHOSPHORUS BUDGETS.....																						
runoff	lbs/yr	1.61	2.26	0.73	220.30	55.29	78.30	14.63	20.99	99.80	22.54	42.04	1.10	134.44	105.83	38.32	27.75	0.82	5.33	5.63	2.28	3.66
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	38.37	15.16	0.00	0.00	105.63	0.00	22.54	64.58	0.00	125.28	0.00	0.00	0.00	2.64	0.00	0.00	0.00
total inflow	**lbs/yr**	**1.61**	**2.26**	**0.73**	**220.30**	**93.66**	**93.47**	**14.63**	**20.99**	**205.43**	**22.54**	**64.58**	**65.67**	**134.44**	**231.11**	**38.32**	**27.75**	**0.82**	**7.98**	**5.63**	**2.28**	**3.66**
net sedimentation	lbs/yr	0.00	1.11	0.45	135.58	48.99	42.65	4.49	5.82	77.75	0.01	0.00	0.03	58.22	135.02	17.01	0.00	0.40	4.45	2.98	1.07	0.00
outflow	lbs/yr	1.60	1.15	0.28	84.72	44.67	50.82	10.14	15.16	127.68	22.54	64.58	65.64	76.22	96.10	21.31	27.75	0.42	3.53	2.64	1.21	3.66
p removal efficiency	%	0.20	48.93	61.38	61.54	52.31	45.63	30.69	27.75	37.85	0.03	0.01	0.05	43.31	58.42	44.39	0.00	48.93	55.81	53.00	46.79	0.02
upstream w-shed p load	lbs/yr	1.61	2.26	0.73	220.30	132.83	99.29	14.63	20.99	346.55	22.54	64.59	65.68	134.44	306.35	38.32	27.75	0.82	10.96	5.63	2.28	3.66
total removal %	%	0.20	48.93	61.38	61.54	66.37	48.82	30.69	27.75	63.16	0.03	0.02	0.07	43.31	68.63	44.39	0.00	48.93	67.83	53.00	46.79	0.02
HYDRAULIC PARAMETERS.....																						
pond mean depth	feet	0.10	1.07	2.22	6.51	5.30	3.72	0.49	0.77	2.44	0.10	0.10	0.10	4.02	7.14	1.89	0.10	1.80	3.00	2.00	0.96	0.10
relative volume	inches	0.00	8.80	47.64	4.28	6.54	1.36	0.81	0.40	4.38	0.00	0.00	0.00	1.00	10.36	1.62	0.00	49.38	84.85	39.04	6.46	0.00
residence time	years	0.00	0.25	1.38	0.12	0.07	0.03	0.02	0.01	0.03	0.00	0.00	0.00	0.03	0.10	0.05	0.00	1.43	1.05	1.13	0.19	0.00
residence time	days	0.00	92.82	502.31	45.12	27.12	11.36	8.54	4.21	12.72	0.00	0.00	0.00	10.57	37.43	17.12	0.00	520.65	381.56	411.57	68.10	0.00
overflow rate	ft/yr	15772.69	4.20	1.61	52.63	71.32	119.71	20.99	66.97	69.94	158886.92	477564.24	488653.83	138.85	69.64	40.40	290377.70	1.26	2.87	1.77	5.14	33682.32
inflow phos conc	ppb	374.84	450.02	450.01	369.30	267.22	416.32	450.02	443.44	245.05	522.02	497.53	494.46	360.93	269.46	340.79	351.57	250.03	237.27	291.79	450.02	400.02
outflow phos conc	ppb	374.09	229.82	173.79	142.02	127.45	226.36	311.93	320.41	152.30	521.84	497.50	494.23	204.62	112.04	189.51	351.56	127.69	104.85	137.14	239.44	399.93
p reaction rate	-	0.00	1.88	4.12	4.16	2.30	1.54	0.64	0.53	0.98	0.00	0.00	0.00	1.35	3.38	1.44	0.00	1.88	2.86	2.40	1.65	0.00
1-rp	-	1.00	0.51	0.39	0.38	0.48	0.54	0.69	0.72	0.62	1.00	1.00	1.00	0.57	0.42	0.56	1.00	0.51	0.44	0.47	0.53	1.00
vlawmo pond volume	acre-ft	0.11	0.13	0.04	15.85	3.66	4.71	0.86	1.26	6.13	1.15	2.30	0.08	9.90	7.81	2.99	2.10	0.09	0.38	0.51	0.13	0.24
LAND USE PARAMETERS.....																						
runoff total P conc	ppb	53.24	449.99	449.98	353.32	405.53	412.84	450.00	427.14	429.29	143.65	231.90	7.27	361.15	354.68	310.84	353.66	250.00	344.73	276.43	449.99	400.00
runoff coefficient		0.02	0.22	0.22	0.37	0.32	0.23	0.31	0.20	0.26	0.04	0.08	0.00	0.37	0.22	0.18	0.51	0.12	0.17	0.14	0.22	0.28
dissolved/total P		0.07	0.30	0.30	0.34	0.30	0.34	0.30	0.33	0.30	0.06	0.10	0.01	0.33	0.28	0.30	0.30	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	28.92	140.00	140.00	149.09	140.00	151.26	140.00	146.70	143.33	43.73	72.13	4.62	156.07	171.66	182.45	140.00	216.00	180.00	205.96	140.00	140.00
POND TSS BUDGETS.....																						
runoff	lbs/yr	761.99	701.19	226.07	84006.95	19231.17	25158.67	4538.67	6685.01	32482.16	6891.10	13406.55	467.60	53167.25	45159.39	18163.97	11016.93	703.31	2426.56	3847.73	706.37	1277.91
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	5048.07	3008.26	0.00	0.00	12844.90	0.00	6891.10	20297.65	0.00	32770.75	0.00	0.00	0.00	384.77	0.00	0.00	0.00
total inflow	**lbs/yr**	**761.99**	**701.19**	**226.07**	**84006.95**	**24279.24**	**28166.92**	**4538.67**	**6685.01**	**45327.06**	**6891.10**	**20297.65**	**20765.25**	**53167.25**	**77930.13**	**18163.97**	**11016.93**	**703.31**	**2811.33**	**3847.73**	**706.37**	**1277.91**
p removal efficiency (no inf)	%	0.00	49.00	62.00	62.00	53.00	46.00	31.00	28.00	38.00	0.00	0.00	0.00	44.00	59.00	45.00	0.00	49.00	56.00	54.00	47.00	0.00
tss removal efficiency (no inf)	%	0.00	78.50	93.00	93.00	87.50	72.00	57.63	55.00	64.00	0.00	0.00	0.00	69.33	93.00	70.00	0.00	78.50	93.00	90.00	74.00	0.00
net sedimentation	lbs/yr	0.00	550.43	210.24	78126.46	21244.33	20280.19	2615.41	3676.76	29009.32	0.00	0.00	0.00	36862.63	72475.02	12714.78	0.00	552.10	2614.54	3462.95	522.71	0.00
outflow	lbs/yr	761.99	150.76	15.82	5880.49	3034.90	7886.74	1923.26	3008.26	16317.74	6891.10	20297.65	20765.25	16304.62	5455.11	5449.19	11016.93	151.21	196.79	384.77	183.66	1277.91
tss removal efficiency (inf)	%	0.00	78.50	93.00	93.00	87.50	72.00	57.63	55.00	64.00	0.00	0.00	0.00	69.33	93.00	70.00	0.00	78.50	93.00	90.00	74.00	0.00
upstream watershed tss load	lbs/yr	761.99	701.19	226.07	84006.95	48925.71	31843.68	4538.67	6685.01	117790.22	6891.10	20297.65	20765.25	53167.25	127507.53	18163.97	11016.93	703.31	6274.29	3847.73	706.37	1277.91
tss total removal efficiency	%	0.00	78.50	93.00	93.00	93.80	75.23	57.63	55.00	86.15	0.00	0.00	0.00	69.33	95.72	70.00	0.00	78.50	96.86	90.00	74.00	0.00
INFILTRATION BMP/POND……																						
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**1.58**	**1.85**	**0.60**	**219.48**	**128.96**	**82.60**	**11.96**	**17.41**	**308.43**	**15.89**	**47.76**	**48.87**	**137.04**	**315.55**	**41.37**	**29.04**	**1.20**	**12.37**	**7.09**	**1.86**	**3.37**
Adjusted TP outflow	**lbs/yr**	**1.60**	**1.15**	**0.28**	**84.72**	**44.67**	**50.82**	**10.14**	**15.16**	**127.68**	**22.54**	**64.58**	**65.64**	**76.22**	**96.10**	**21.31**	**27.75**	**0.42**	**3.53**	**2.64**	**1.21**	**3.66**
Adjusted TSS outflow	**lbs/yr**	**761.99**	**150.76**	**15.82**	**5880.49**	**3034.90**	**7886.74**	**1923.26**	**3008.26**	**16317.74**	**6891.10**	**20297.65**	**20765.25**	**16304.62**	**5455.11**	**5449.19**	**11016.93**	**151.21**	**196.79**	**384.77**	**183.66**	**1277.91**

Apple Valley Loading Assessment
68-07360
Existing (2005) TP LOADS

		exit 2	exit 3a	exit 3b	exit 4	exit 5	exit 6	exit 7	AL-LL	BD-LL	EVR-LL	WVR-LL	Lakeville	Burnsville	Rosemount	Eagan
Routed TO:		Burnsville	Burnsville	exit 4	Eagan	Eagan	Eagan	Rosemount	AL-9	Burnsville	Lakeville	Lakeville				
INPUT VARIABLES....	UNITS															
case label	-															
Total watershed area		3.6	9.0	9.4	23.1	0.7	884.6	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total watershed area (w/o wat	acres	3.6	9.0	9.4	23.1	0.7	884.6	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
basin area	acres	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
basin volume	acre-ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	0%	56%	17%	100%	6%	70%	0%	0%	0%	0%	0%	0%	0%	0%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	27%	0%	100%	100%	100%	100%	100%	100%	100%	100%
Golf Course		0%	0%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		100%	100%	44%	83%	0%	1%	30%	0%	0%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	46%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING…….																
tributary land area	ac	3.57	9.00	9.44	32.51	0.73	884.56	13.92	16.29	46.91	88.90	103.42	8493.27	1261.11	64.22	917.80
tributary water area	ac	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	2.24	6.28	3.54	371.49	74.93	4.84	0.00
direct and ponded area	ac	3.57	9.00	9.44	32.51	0.73	884.56	13.92	16.86	49.16	95.18	106.96	8864.76	1336.03	69.06	917.80
ASSUMED EXPORT FACTORS.....																
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	400.00	400.00	427.88	408.58	449.98	306.32	435.23	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.45	0.30	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
unit runoff	in/yr	9.55	9.55	8.38	9.19	7.45	3.80	8.07	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73
unit export	lbs/ac-y	0.87	0.87	0.81	0.85	0.76	0.28	0.79	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
POND WATER BUDGETS.....																
runoff	ac-ft/yr	2.84	7.16	6.59	17.66	0.45	280.32	9.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream pond	ac-ft/yr	0.00	0.00	0.00	6.59	0.00	0.00	0.00	8.05	31.45	49.15	56.00	5553.14	793.25	40.84	305.03
total inflow	**ac-ft/yr**	**2.84**	**7.16**	**6.59**	**24.25**	**0.45**	**280.32**	**9.36**	**8.05**	**31.45**	**49.15**	**56.00**	**5553.14**	**793.25**	**40.84**	**305.03**
outflow	ac-ft/yr	2.84	7.16	6.59	24.25	0.45	280.32	9.36	8.05	31.45	49.15	56.00	5553.14	793.25	40.84	305.03
POND PHOSPHORUS BUDGETS.....																
runoff	lbs/yr	3.09	7.79	7.61	19.54	0.55	246.37	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream pond	lbs/yr	0.00	0.00	0.00	7.61	0.00	0.00	0.00	6.84	23.07	36.13	42.10	2626.75	625.37	18.82	274.06
total inflow	**lbs/yr**	**3.09**	**7.79**	**7.61**	**27.15**	**0.55**	**246.37**	**11.00**	**6.84**	**23.07**	**36.13**	**42.10**	**2626.75**	**625.37**	**18.82**	**274.06**
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	3.09	7.79	7.61	27.14	0.55	246.36	11.00	6.84	23.07	36.13	42.09	2626.75	625.37	18.82	274.06
p removal efficiency	%	0.03	0.01	0.01	0.00	0.18	0.00	0.01	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00
upstream w-shed p load	lbs/yr	3.09	7.79	7.61	27.15	0.55	246.37	11.00	10.27	37.46	57.65	64.17	6266.07	933.90	49.34	274.07
total removal %	%	0.03	0.01	0.01	0.01	0.18	0.00	0.01	33.38	38.42	37.33	34.40	58.08	33.04	61.85	0.00
HYDRAULIC PARAMETERS.....																
pond mean depth	feet	0.10	0.10	0.10	0.10	0.10	0.10	0.10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
relative volume	inches	0.00	0.00	0.00	0.00	0.00	0.00	0.00	240.00	240.00	240.00	240.00	240.00	240.00	240.00	240.00
residence time	years	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
residence time	days	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
overflow rate	ft/yr	28422.86	71612.53	65895.18	242521.59	4537.40	2803249.00	93584.35	804760.45	3144729.48	4914670.49	5599939.76	###########	79324521.65	4083667.67	30503081.29
inflow phos conc	ppb	400.02	400.02	424.81	411.81	450.01	323.35	432.54	312.84	269.91	270.49	276.57	174.03	290.06	169.60	330.57
outflow phos conc	ppb	399.92	399.98	424.76	411.80	449.18	323.35	432.50	312.73	269.89	270.47	276.55	174.03	290.05	169.59	330.56
p reaction rate	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-rp	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
vlawmo pond volume	acre-ft	0.21	0.52	0.48	1.28	0.03	20.24	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LAND USE PARAMETERS.....																
runoff total P conc	ppb	400.00	400.00	427.88	408.58	449.98	306.32	435.23	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
runoff coefficient		0.28	0.28	0.24	0.27	0.22	0.11	0.23	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
dissolved/total P		0.30	0.30	0.30	0.30	0.30	0.45	0.30	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
runoff TSS conc	ppm	140.00	140.00	140.00	140.00	140.00	209.17	140.00	216.00	216.00	216.00	216.00	216.00	216.00	216.00	216.00
POND TSS BUDGETS.....																
runoff	lbs/yr	1078.37	2716.98	2500.07	6701.21	172.15	152492.03	3550.59	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
upstream pond	lbs/yr	0.00	0.00	0.00	2500.07	0.00	0.00	0.00	1340.59	4494.85	7606.09	8676.84	445754.93	152991.62	4204.93	161865.46
total inflow	**lbs/yr**	**1078.37**	**2716.98**	**2500.07**	**9201.28**	**172.15**	**152492.03**	**3550.59**	**1340.60**	**4494.86**	**7606.10**	**8676.84**	**445754.94**	**152991.63**	**4204.94**	**161865.46**
p removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	1078.37	2716.98	2500.07	9201.28	172.15	152492.03	3550.59	1340.60	4494.86	7606.10	8676.84	445754.94	152991.63	4204.94	161865.46
tss removal efficiency (inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
upstream watershed tss load	lbs/yr	1078.37	2716.98	2500.07	9201.28	172.15	152492.03	3550.59	3384.10	11931.13	19438.18	22871.96	2150125.54	305066.77	15493.45	161865.46
tss total removal efficiency	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.39	62.33	60.87	62.06	79.27	49.85	72.86	0.00
INFILTRATION BMP/POND……																
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**2.84**	**7.16**	**6.59**	**24.25**	**0.45**	**280.32**	**9.36**	**8.05**	**31.45**	**49.15**	**56.00**	**5553.14**	**793.25**	**40.84**	**305.03**
Adjusted TP outflow	**lbs/yr**	**3.09**	**7.79**	**7.61**	**27.14**	**0.55**	**246.36**	**11.00**	**6.84**	**23.07**	**36.13**	**42.09**	**2626.75**	**625.37**	**18.82**	**274.06**
Adjusted TSS outflow	**lbs/yr**	**1078.37**	**2716.98**	**2500.07**	**9201.28**	**172.15**	**152492.03**	**3550.59**	**1340.60**	**4494.86**	**7606.10**	**8676.84**	**445754.94**	**152991.63**	**4204.94**	**161865.46**

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future BD-1	BD-1	Future BD-10	BD-10	Future BD-100	BD-100	Future BD-101	BD-101	Future BD-102	BD-102	Future BD-103	BD-103	Future BD-104	BD-104	Future BD-11	BD-11	Future BD-110	BD-110	Future BD-12	BD-12	Future BD-120	BD-120	Future BD-13	BD-13	Future BD-14	BD-14
		BD-1	BD-102	BD-10	BD-11	BD-100	BD-102	BD-101	BD-LL	BD-102	BD-10	BD-103	BD-LL	BD-104	BD-LL	BD-11	Burnsville	BD-110	BD-LL	BD-12	BD-11	BD-120	BD-LL	BD-13	BD-LL	BD-14	Burnsville
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	30.6	0.00	32.1	0.00	3.0	0.00	1.6	0.00	26.6	0.00	2.7	0.00	1.6	0.00	32.1	0.00	3.7	0.00	3.1	0.00	2.0	0.00	9.4	0.00	43.8
Total watershed area (w/o wat	acres	0.00	30.5	0.00	30.9	0.00	2.8	0.00	1.6	0.00	26.4	0.00	2.6	0.00	1.6	0.00	31.2	0.00	3.3	0.00	2.6	0.00	2.0	0.00	8.4	0.00	42.0
basin area	acres	0.00	0.09	0.00	1.27	0.00	0.18	0.00	0.00	0.00	0.25	0.00	0.19	0.00	0.00	0.00	0.84	0.00	0.39	0.00	0.49	0.00	0.00	0.00	0.96	0.00	1.78
basin volume	acre-ft	0.00	0.03	0.00	2.78	0.00	0.11	0.00	0.00	0.00	0.19	0.00	0.12	0.00	0.00	0.00	2.77	0.00	0.39	0.00	0.57	0.00	0.00	0.00	1.74	0.00	2.41
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	100%	0%	86%	0%	100%	0%	100%	0%	99%	0%	100%	0%	44%	0%	87%	0%	32%	0%	100%	0%	34%	0%	100%	0%	88%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	0%	6%	0%	68%	0%	0%	0%	66%	0%	0%	0%	4%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	30.52	0.00	199.63	0.00	2.84	0.00	1.63	0.00	168.76	0.00	2.56	0.00	1.58	0.00	273.46	0.00	3.29	0.00	2.57	0.00	1.98	0.00	8.45	0.00	107.23
tributary water area	ac	0.00	0.09	0.00	2.26	0.00	0.18	0.00	0.00	0.00	0.99	0.00	0.19	0.00	0.00	0.00	6.04	0.00	0.39	0.00	0.49	0.00	0.00	0.00	0.96	0.00	2.81
direct and ponded area	ac	0.00	30.61	0.00	201.89	0.00	3.02	0.00	1.63	0.00	169.75	0.00	2.74	0.00	1.58	0.00	279.50	0.00	3.68	0.00	3.06	0.00	1.98	0.00	9.41	0.00	110.04
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.50	0.00	371.82	0.00	391.50	0.00	391.50	0.00	390.50	0.00	391.50	0.00	396.29	0.00	384.44	0.00	397.24	0.00	391.50	0.00	397.14	0.00	391.50	0.00	380.87
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.45	0.00	6.86	0.00	7.45	0.00	7.45	0.00	7.42	0.00	7.45	0.00	8.63	0.00	7.41	0.00	8.87	0.00	7.45	0.00	8.84	0.00	7.45	0.00	7.20
unit export	lbs/ac-y	0.00	0.66	0.00	0.59	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.78	0.00	0.65	0.00	0.80	0.00	0.66	0.00	0.80	0.00	0.66	0.00	0.63
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	18.94	0.00	17.65	0.00	1.76	0.00	1.01	0.00	16.29	0.00	1.59	0.00	1.13	0.00	19.26	0.00	2.43	0.00	1.59	0.00	1.46	0.00	5.24	0.00	25.21
upstream pond	ac-ft/yr	0.00	0.00	0.00	102.07	0.00	0.00	0.00	0.00	0.00	85.77	0.00	0.00	0.00	0.00	0.00	148.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.44
total inflow	**ac-ft/yr**	**0.00**	**18.94**	**0.00**	**119.72**	**0.00**	**1.76**	**0.00**	**1.01**	**0.00**	**102.07**	**0.00**	**1.59**	**0.00**	**1.13**	**0.00**	**167.39**	**0.00**	**2.43**	**0.00**	**1.59**	**0.00**	**1.46**	**0.00**	**5.24**	**0.00**	**65.65**
outflow	ac-ft/yr	0.00	18.94	0.00	119.72	0.00	1.76	0.00	1.01	0.00	102.07	0.00	1.59	0.00	1.13	0.00	167.39	0.00	2.43	0.00	1.59	0.00	1.46	0.00	5.24	0.00	65.65
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	20.16	0.00	18.34	0.00	1.87	0.00	1.08	0.00	17.33	0.00	1.69	0.00	1.22	0.00	20.36	0.00	2.62	0.00	1.70	0.00	1.57	0.00	5.58	0.00	26.52
upstream pond	lbs/yr	0.00	0.00	0.00	85.95	0.00	0.00	0.00	0.00	0.00	76.97	0.00	0.00	0.00	0.00	0.00	81.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.18
total inflow	**lbs/yr**	**0.00**	**20.16**	**0.00**	**104.29**	**0.00**	**1.87**	**0.00**	**1.08**	**0.00**	**94.30**	**0.00**	**1.69**	**0.00**	**1.22**	**0.00**	**101.59**	**0.00**	**2.62**	**0.00**	**1.70**	**0.00**	**1.57**	**0.00**	**5.58**	**0.00**	**59.70**
net sedimentation	lbs/yr	0.00	1.85	0.00	38.90	0.00	0.65	0.00	0.00	0.00	8.34	0.00	0.61	0.00	0.00	0.00	29.18	0.00	1.18	0.00	0.82	0.00	0.00	0.00	3.06	0.00	23.28
outflow	lbs/yr	0.00	18.31	0.00	65.40	0.00	1.22	0.00	1.08	0.00	85.95	0.00	1.08	0.00	1.22	0.00	72.41	0.00	1.44	0.00	0.87	0.00	1.57	0.00	2.51	0.00	36.43
p removal efficiency	%	100.00	9.16	100.00	37.29	100.00	34.82	100.00	0.07	100.00	8.85	100.00	35.82	100.00	0.06	100.00	28.73	100.00	45.15	100.00	48.45	100.00	0.05	100.00	54.93	100.00	38.99
upstream w-shed p load	lbs/yr	0.00	20.16	0.00	126.22	0.00	1.87	0.00	1.08	0.00	107.88	0.00	1.69	0.00	1.22	0.00	176.90	0.00	2.62	0.00	1.70	0.00	1.57	0.00	5.58	0.00	69.42
total removal %	%	100.00	9.16	100.00	48.19	100.00	34.82	100.00	0.07	100.00	20.33	100.00	35.82	100.00	0.06	100.00	59.07	100.00	45.15	100.00	48.45	100.00	0.05	100.00	54.93	100.00	47.53
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	0.39	1.00	2.18	1.00	0.60	1.00	0.10	1.00	0.76	1.00	0.62	1.00	0.10	1.00	3.30	1.00	1.01	1.00	1.17	1.00	0.10	1.00	1.82	1.00	1.35
relative volume	inches	0.00	0.06	0.00	5.45	0.00	2.09	0.00	0.00	0.00	0.41	0.00	2.52	0.00	0.00	0.00	4.97	0.00	5.60	0.00	12.45	0.00	0.00	0.00	11.52	0.00	3.30
residence time	years	87585.71	0.00	87585.71	0.02	87585.71	0.06	87585.71	0.00	87585.71	0.00	87585.71	0.07	87585.71	0.00	87585.71	0.02	87585.71	0.16	87585.71	0.36	87585.71	0.00	87585.71	0.33	87585.71	0.04
residence time	days	31968784.45	0.67	31968784.45	8.47	31968784.45	22.04	31968784.45	0.00	31968784.45	0.68	31968784.45	26.54	31968784.45	0.00	31968784.45	6.04	31968784.45	59.09	31968784.45	131.22	31968784.45	0.00	31968784.45	121.45	31968784.45	13.38
overflow rate	ft/yr	0.00	210.47	0.00	94.12	0.00	9.95	0.00	10122.47	0.00	405.03	0.00	8.53	0.00	11344.10	0.00	199.27	0.00	6.22	0.00	3.25	0.00	14551.19	0.00	5.46	0.00	36.80
inflow phos conc	ppb	366.44	391.52	366.44	320.50	366.44	391.52	366.44	391.52	366.44	339.90	366.44	391.52	366.44	396.82	366.44	223.29	366.44	397.70	366.44	391.52	366.44	397.61	366.44	391.52	366.44	334.56
outflow phos conc	ppb	366.44	355.66	366.44	200.97	366.44	255.20	366.44	391.24	366.44	309.83	366.44	251.28	366.44	396.56	366.44	159.15	366.44	218.15	366.44	201.81	366.44	397.41	366.44	176.44	366.44	204.13
p reaction rate	-	1.57	0.11	1.57	0.95	1.57	0.82	1.57	0.00	1.57	0.11	1.57	0.87	1.57	0.00	1.57	0.57	1.57	1.50	1.57	1.82	1.57	0.00	1.57	2.70	1.57	1.05
1-rp	-	1.00	0.91	1.00	0.63	1.00	0.65	1.00	1.00	1.00	0.91	1.00	0.64	1.00	1.00	1.00	0.71	1.00	0.55	1.00	0.52	1.00	1.00	1.00	0.45	1.00	0.61
vlawmo pond volume	acre-ft	0.00	1.37	0.00	1.27	0.00	0.13	0.00	0.07	0.00	1.18	0.00	0.11	0.00	0.08	0.00	1.39	0.00	0.18	0.00	0.12	0.00	0.11	0.00	0.38	0.00	1.82
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.50	0.00	371.82	0.00	391.50	0.00	391.50	0.00	390.50	0.00	391.50	0.00	396.29	0.00	384.44	0.00	397.24	0.00	391.50	0.00	397.14	0.00	391.50	0.00	380.87
runoff coefficient		0.00	0.22	0.00	0.20	0.00	0.22	0.00	0.22	0.00	0.21	0.00	0.22	0.00	0.25	0.00	0.21	0.00	0.26	0.00	0.22	0.00	0.26	0.00	0.22	0.00	0.21
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	140.00	0.00	150.57	0.00	140.00	0.00	140.00	0.00	140.40	0.00	140.00	0.00	140.00	0.00	144.07	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	145.89
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	7186.67	0.00	6936.93	0.00	668.23	0.00	384.05	0.00	6186.34	0.00	602.30	0.00	430.40	0.00	7401.67	0.00	920.90	0.00	604.89	0.00	552.08	0.00	1988.35	0.00	9746.47
upstream pond	lbs/yr	0.00	0.00	0.00	23071.31	0.00	0.00	0.00	0.00	0.00	22524.63	0.00	0.00	0.00	0.00	0.00	12891.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8537.00
total inflow	**lbs/yr**	**0.00**	**7186.67**	**0.00**	**30008.24**	**0.00**	**668.23**	**0.00**	**384.05**	**0.00**	**28710.96**	**0.00**	**602.30**	**0.00**	**430.40**	**0.00**	**20292.97**	**0.00**	**920.90**	**0.00**	**604.89**	**0.00**	**552.08**	**0.00**	**1988.35**	**0.00**	**18283.48**
p removal efficiency (no inf)	%	0.00	11.00	0.00	40.00	0.00	38.00	0.00	0.00	0.00	10.00	0.00	39.00	0.00	0.00	0.00	31.00	0.00	46.00	0.00	51.00	0.00	0.00	0.00	58.00	0.00	42.00
tss removal efficiency (no inf)	%	0.00	21.61	0.00	66.00	0.00	64.00	0.00	0.00	0.00	19.64	0.00	65.00	0.00	0.00	0.00	57.63	0.00	72.00	0.00	83.00	0.00	0.00	0.00	93.00	0.00	68.00
net sedimentation	lbs/yr	0.00	1552.83	0.00	19805.44	0.00	427.67	0.00	0.00	0.00	5639.65	0.00	391.50	0.00	0.00	0.00	11693.83	0.00	663.05	0.00	502.06	0.00	0.00	0.00	1849.17	0.00	12432.76
outflow	lbs/yr	0.00	5633.84	0.00	10202.80	0.00	240.56	0.00	384.05	0.00	23071.31	0.00	210.81	0.00	430.40	0.00	8599.15	0.00	257.85	0.00	102.83	0.00	552.08	0.00	139.18	0.00	5850.71
tss removal efficiency (inf)	%	100.00	21.61	100.00	66.00	100.00	64.00	100.00	0.00	100.00	19.64	100.00	65.00	100.00	0.00	100.00	57.63	100.00	72.00	100.00	83.00	100.00	0.00	100.00	93.00	100.00	68.00
upstream watershed tss load	lbs/yr	0.00	7186.67	0.00	45997.77	0.00	668.23	0.00	384.05	0.00	39060.85	0.00	602.30	0.00	430.40	0.00	64176.38	0.00	920.90	0.00	604.89	0.00	552.08	0.00	1988.35	0.00	25203.07
tss total removal efficiency	%	100.00	21.61	100.00	77.82	100.00	64.00	100.00	0.00	100.00	40.93	100.00	65.00	100.00	0.00	100.00	86.60	100.00	72.00	100.00	83.00	100.00	0.00	100.00	93.00	100.00	76.79
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**18.94**	**0.00**	**119.72**	**0.00**	**1.76**	**0.00**	**1.01**	**0.00**	**102.07**	**0.00**	**1.59**	**0.00**	**1.13**	**0.00**	**167.39**	**0.00**	**2.43**	**0.00**	**1.59**	**0.00**	**1.46**	**0.00**	**5.24**	**0.00**	**65.65**
Adjusted TP outflow	**lbs/yr**	**0.00**	**18.31**	**0.00**	**65.40**	**0.00**	**1.22**	**0.00**	**1.08**	**0.00**	**85.95**	**0.00**	**1.08**	**0.00**	**1.22**	**0.00**	**72.41**	**0.00**	**1.44**	**0.00**	**0.87**	**0.00**	**1.57**	**0.00**	**2.51**	**0.00**	**36.43**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**5633.84**	**0.00**	**10202.80**	**0.00**	**240.56**	**0.00**	**384.05**	**0.00**	**23071.31**	**0.00**	**210.81**	**0.00**	**430.40**	**0.00**	**8599.15**	**0.00**	**257.85**	**0.00**	**102.83**	**0.00**	**552.08**	**0.00**	**139.18**	**0.00**	**5850.71**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	23.17	0.00	20.96	0.00	2.15	0.00	1.24	0.00	19.92	0.00	1.94	0.00	1.29	0.00	23.11	0.00	2.73	0.00	1.95	0.00	1.64	0.00	6.41	0.00	30.18
Adjusted TP outflow	**lbs/yr**	**0.00**	**20.79**	**0.00**	**71.13**	**0.00**	**1.35**	**0.00**	**1.24**	**0.00**	**96.18**	**0.00**	**1.20**	**0.00**	**1.29**	**0.00**	**77.84**	**0.00**	**1.48**	**0.00**	**0.96**	**0.00**	**1.64**	**0.00**	**2.75**	**0.00**	**39.67**
upstream pond	lbs/yr	0.00	0.00	0.00	96.18	0.00	0.00	0.00	0.00	0.00	86.72	0.00	0.00	0.00	0.00	0.00	88.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.09
total inflow	**lbs/yr**	**0.00**	**23.17**	**0.00**	**117.15**	**0.00**	**2.15**	**0.00**	**1.24**	**0.00**	**106.63**	**0.00**	**1.94**	**0.00**	**1.29**	**0.00**	**111.56**	**0.00**	**2.73**	**0.00**	**1.95**	**0.00**	**1.64**	**0.00**	**6.41**	**0.00**	**67.27**
outflow	lbs/yr	0.00	20.79	0.00	71.13	0.00	1.35	0.00	1.24	0.00	96.18	0.00	1.20	0.00	1.29	0.00	77.84	0.00	1.48	0.00	0.96	0.00	1.64	0.00	2.75	0.00	39.67
inflow phos conc	ppb	381.54	450.02	381.54	360.01	381.54	450.02	381.54	450.02	381.54	384.38	381.54	450.02	381.54	418.84	381.54	245.21	381.54	413.65	381.54	450.02	381.54	414.20	381.54	450.02	381.54	376.98
outflow phos conc	ppb	381.54	403.80	381.54	218.59	381.54	282.71	381.54	449.64	381.54	346.71	381.54	278.17	381.54	418.55	381.54	171.09	381.54	224.13	381.54	221.50	381.54	413.98	381.54	192.92	381.54	222.30
p reaction rate	-	1.63	0.13	1.63	1.07	1.63	0.94	1.63	0.00	1.63	0.12	1.63	1.00	1.63	0.00	1.63	0.62	1.63	1.56	1.63	2.10	1.63	0.00	1.63	3.11	1.63	1.18
1-rp	-	1.00	0.90	1.00	0.61	1.00	0.63	1.00	1.00	1.00	0.90	1.00	0.62	1.00	1.00	1.00	0.70	1.00	0.54	1.00	0.49	1.00	1.00	1.00	0.43	1.00	0.59
runoff total p calc	ppb	0.00	450.00	0.00	422.19	0.00	450.00	0.00	449.99	0.00	448.69	0.00	450.00	0.00	421.81	0.00	436.21	0.00	416.22	0.00	450.00	0.00	416.83	0.00	450.00	0.00	432.52

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future BD-140	BD-140	Future BD-15	BD-15	Future BD-150	BD-150	Future BD-2	BD-2	Future BD-3	BD-3	Future BD-4	BD-4	Future BD-5	BD-5	Future BD-6	BD-6	Future BD-61	BD-61	Future BD-7	BD-7	Future BD-70	BD-70	Future BD-71	BD-71	Future BD-8	BD-8
		BD-140	BD-14	BD-15	BD-14	BD-150	BD-LL	BD-2	BD-LL	BD-3	BD-102	BD-4	BD-5	BD-5	BD-7	BD-6	BD-11	BD-61	BD-6	BD-7	BD-102	BD-70	BD-7	BD-71	BD-102	BD-8	BD-11
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	18.8	0.00	47.5	0.00	6.8	0.00	21.3	0.00	5.6	0.00	6.1	0.00	25.2	0.00	4.6	0.00	12.2	0.00	63.1	0.00	6.2	0.00	3.4	0.00	8.5
Total watershed area (w/o wat	acres	0.00	17.9	0.00	47.3	0.00	6.8	0.00	20.6	0.00	5.6	0.00	6.0	0.00	25.0	0.00	4.5	0.00	12.0	0.00	62.9	0.00	6.2	0.00	3.4	0.00	8.1
basin area	acres	0.00	0.88	0.00	0.14	0.00	0.05	0.00	0.66	0.00	0.00	0.00	0.09	0.00	0.15	0.00	0.12	0.00	0.25	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.41
basin volume	acre-ft	0.00	1.52	0.00	0.07	0.00	0.01	0.00	0.93	0.00	0.00	0.00	0.03	0.00	0.08	0.00	0.06	0.00	0.18	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.43
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	78%	0%	96%	0%	50%	0%	80%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	94%	0%	42%	0%	100%	0%	66%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	34%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	8%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	58%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	14%	0%	3%	0%	50%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	17.91	0.00	47.33	0.00	6.80	0.00	20.64	0.00	5.55	0.00	6.03	0.00	31.05	0.00	16.48	0.00	11.98	0.00	100.13	0.00	6.17	0.00	3.36	0.00	8.13
tributary water area	ac	0.00	0.88	0.00	0.14	0.00	0.05	0.00	0.66	0.00	0.00	0.00	0.09	0.00	0.23	0.00	0.37	0.00	0.25	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.41
direct and ponded area	ac	0.00	18.79	0.00	47.47	0.00	6.85	0.00	21.30	0.00	5.55	0.00	6.11	0.00	31.28	0.00	16.85	0.00	12.23	0.00	100.60	0.00	6.17	0.00	3.36	0.00	8.54
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	381.60	0.00	389.85	0.00	395.77	0.00	392.11	0.00	391.50	0.00	391.50	0.00	391.50	0.00	391.50	0.00	391.50	0.00	381.48	0.00	309.09	0.00	391.50	0.00	391.50
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.41	0.00	7.45	0.00	8.50	0.00	8.01	0.00	7.45	0.00	7.45	0.00	7.45	0.00	7.45	0.00	7.45	0.00	7.19	0.00	5.00	0.00	7.45	0.00	8.52
unit export	lbs/ac-y	0.00	0.65	0.00	0.66	0.00	0.76	0.00	0.71	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.63	0.00	0.38	0.00	0.66	0.00	0.76
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	11.05	0.00	29.39	0.00	4.82	0.00	13.77	0.00	3.44	0.00	3.74	0.00	15.53	0.00	2.79	0.00	7.44	0.00	37.70	0.00	2.57	0.00	2.09	0.00	5.77
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.74	0.00	7.44	0.00	0.00	0.00	21.84	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**0.00**	**11.05**	**0.00**	**29.39**	**0.00**	**4.82**	**0.00**	**13.77**	**0.00**	**3.44**	**0.00**	**3.74**	**0.00**	**19.27**	**0.00**	**10.23**	**0.00**	**7.44**	**0.00**	**59.54**	**0.00**	**2.57**	**0.00**	**2.09**	**0.00**	**5.77**
outflow	ac-ft/yr	0.00	11.05	0.00	29.39	0.00	4.82	0.00	13.77	0.00	3.44	0.00	3.74	0.00	19.27	0.00	10.23	0.00	7.44	0.00	59.54	0.00	2.57	0.00	2.09	0.00	5.77
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	11.66	0.00	31.24	0.00	5.19	0.00	14.68	0.00	3.67	0.00	3.98	0.00	16.53	0.00	2.97	0.00	7.91	0.00	39.77	0.00	2.36	0.00	2.22	0.00	6.14
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18	0.00	5.30	0.00	0.00	0.00	19.07	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**11.66**	**0.00**	**31.24**	**0.00**	**5.19**	**0.00**	**14.68**	**0.00**	**3.67**	**0.00**	**3.98**	**0.00**	**19.71**	**0.00**	**8.27**	**0.00**	**7.91**	**0.00**	**58.84**	**0.00**	**2.36**	**0.00**	**2.22**	**0.00**	**6.14**
net sedimentation	lbs/yr	0.00	6.03	0.00	3.68	0.00	0.57	0.00	6.80	0.00	0.00	0.00	0.80	0.00	3.00	0.00	1.21	0.00	2.62	0.00	7.29	0.00	0.00	0.00	0.00	0.00	2.63
outflow	lbs/yr	0.00	5.63	0.00	27.55	0.00	4.62	0.00	7.88	0.00	3.66	0.00	3.18	0.00	16.71	0.00	7.06	0.00	5.30	0.00	51.55	0.00	2.36	0.00	2.22	0.00	3.50
p removal efficiency	%	100.00	51.74	100.00	11.79	100.00	11.00	100.00	46.34	100.00	0.02	100.00	20.08	100.00	15.23	100.00	14.63	100.00	33.05	100.00	12.39	100.00	0.02	100.00	0.03	100.00	42.94
upstream w-shed p load	lbs/yr	0.00	11.66	0.00	31.24	0.00	5.19	0.00	14.68	0.00	3.67	0.00	3.98	0.00	20.50	0.00	10.88	0.00	7.91	0.00	62.64	0.00	2.36	0.00	2.22	0.00	6.14
total removal %	%	100.00	51.74	100.00	11.79	100.00	11.00	100.00	46.34	100.00	0.02	100.00	20.08	100.00	18.53	100.00	35.14	100.00	33.05	100.00	17.70	100.00	0.02	100.00	0.03	100.00	42.94
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.72	1.00	0.52	1.00	0.26	1.00	1.42	1.00	0.10	1.00	0.37	1.00	0.53	1.00	0.47	1.00	0.75	1.00	0.73	1.00	0.10	1.00	0.10	1.00	1.04
relative volume	inches	0.00	4.77	0.00	0.09	0.00	0.09	0.00	2.35	0.00	0.00	0.00	0.30	0.00	0.17	0.00	0.69	0.00	0.85	0.00	0.16	0.00	0.00	0.00	0.00	0.00	2.56
residence time	years	87585.71	0.14	87585.71	0.00	87585.71	0.00	87585.71	0.07	87585.71	0.00	87585.71	0.01	87585.71	0.00	87585.71	0.01	87585.71	0.02	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.07
residence time	days	31968784.45	50.25	31968784.45	0.92	31968784.45	1.00	31968784.45	24.74	31968784.45	0.00	31968784.45	3.14	31968784.45	1.46	31968784.45	2.00	31968784.45	9.00	31968784.45	1.06	31968784.45	0.00	31968784.45	0.00	31968784.45	27.02
overflow rate	ft/yr	0.00	12.50	0.00	206.98	0.00	96.36	0.00	20.93	0.00	34442.35	0.00	43.48	0.00	131.98	0.00	85.23	0.00	30.23	0.00	251.23	0.00	25708.44	0.00	20852.01	0.00	14.06
inflow phos conc	ppb	366.44	388.17	366.44	391.01	366.44	396.32	366.44	392.24	366.44	391.52	366.44	391.52	366.44	376.27	366.44	297.44	366.44	391.52	366.44	363.58	366.44	338.04	366.44	391.52	366.44	391.52
outflow phos conc	ppb	366.44	187.32	366.44	344.92	366.44	352.74	366.44	210.49	366.44	391.44	366.44	312.91	366.44	318.98	366.44	253.92	366.44	262.11	366.44	318.55	366.44	337.96	366.44	391.38	366.44	223.40
p reaction rate	-	1.57	2.22	1.57	0.15	1.57	0.14	1.57	1.61	1.57	0.00	1.57	0.31	1.57	0.21	1.57	0.20	1.57	0.74	1.57	0.16	1.57	0.00	1.57	0.00	1.57	1.32
1-rp	-	1.00	0.48	1.00	0.88	1.00	0.89	1.00	0.54	1.00	1.00	1.00	0.80	1.00	0.85	1.00	0.85	1.00	0.67	1.00	0.88	1.00	1.00	1.00	1.00	1.00	0.57
vlawmo pond volume	acre-ft	0.00	0.80	0.00	2.12	0.00	0.35	0.00	0.99	0.00	0.25	0.00	0.27	0.00	1.12	0.00	0.20	0.00	0.54	0.00	2.72	0.00	0.19	0.00	0.15	0.00	0.42
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	381.60	0.00	389.85	0.00	395.77	0.00	392.11	0.00	391.50	0.00	391.50	0.00	391.50	0.00	391.50	0.00	391.50	0.00	381.48	0.00	309.09	0.00	391.50	0.00	391.50
runoff coefficient		0.00	0.21	0.00	0.22	0.00	0.25	0.00	0.23	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.21	0.00	0.14	0.00	0.22	0.00	0.25
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	145.94	0.00	141.02	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	144.20	0.00	184.26	0.00	140.00	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	4270.45	0.00	11186.15	0.00	1827.97	0.00	5225.08	0.00	1306.75	0.00	1418.58	0.00	5891.97	0.00	1059.30	0.00	2821.11	0.00	14435.71	0.00	1175.48	0.00	791.13	0.00	2187.81
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	805.55	0.00	1072.02	0.00	0.00	0.00	5636.51	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**4270.45**	**0.00**	**11186.15**	**0.00**	**1827.97**	**0.00**	**5225.08**	**0.00**	**1306.75**	**0.00**	**1418.58**	**0.00**	**6697.53**	**0.00**	**2131.32**	**0.00**	**2821.11**	**0.00**	**20072.22**	**0.00**	**1175.48**	**0.00**	**791.13**	**0.00**	**2187.81**
p removal efficiency (no inf)	%	0.00	54.00	0.00	14.00	0.00	12.00	0.00	49.00	0.00	0.00	0.00	22.00	0.00	17.00	0.00	16.00	0.00	36.00	0.00	14.00	0.00	0.00	0.00	0.00	0.00	46.00
tss removal efficiency (no inf)	%	0.00	90.00	0.00	27.50	0.00	23.57	0.00	78.50	0.00	0.00	0.00	43.21	0.00	33.39	0.00	31.43	0.00	62.00	0.00	27.50	0.00	0.00	0.00	0.00	0.00	72.00
net sedimentation	lbs/yr	0.00	3843.40	0.00	3076.19	0.00	430.88	0.00	4101.69	0.00	0.00	0.00	613.03	0.00	2236.50	0.00	669.84	0.00	1749.09	0.00	5519.86	0.00	0.00	0.00	0.00	0.00	1575.22
outflow	lbs/yr	0.00	427.04	0.00	8109.96	0.00	1397.09	0.00	1123.39	0.00	1306.75	0.00	805.55	0.00	4461.03	0.00	1461.47	0.00	1072.02	0.00	14552.36	0.00	1175.48	0.00	791.13	0.00	612.59
tss removal efficiency (inf)	%	100.00	90.00	100.00	27.50	100.00	23.57	100.00	78.50	100.00	0.00	100.00	43.21	100.00	33.39	100.00	31.43	100.00	62.00	100.00	27.50	100.00	0.00	100.00	0.00	100.00	72.00
upstream watershed tss load	lbs/yr	0.00	4270.45	0.00	11186.15	0.00	1827.97	0.00	5225.08	0.00	1306.75	0.00	1418.58	0.00	7310.56	0.00	3880.40	0.00	2821.11	0.00	22921.74	0.00	1175.48	0.00	791.13	0.00	2187.81
tss total removal efficiency	%	100.00	90.00	100.00	27.50	100.00	23.57	100.00	78.50	100.00	0.00	100.00	43.21	100.00	38.98	100.00	62.34	100.00	62.00	100.00	36.51	100.00	0.00	100.00	0.00	100.00	72.00
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**11.05**	**0.00**	**29.39**	**0.00**	**4.82**	**0.00**	**13.77**	**0.00**	**3.44**	**0.00**	**3.74**	**0.00**	**19.27**	**0.00**	**10.23**	**0.00**	**7.44**	**0.00**	**59.54**	**0.00**	**2.57**	**0.00**	**2.09**	**0.00**	**5.77**
Adjusted TP outflow	**lbs/yr**	**0.00**	**5.63**	**0.00**	**27.55**	**0.00**	**4.62**	**0.00**	**7.88**	**0.00**	**3.66**	**0.00**	**3.18**	**0.00**	**16.71**	**0.00**	**7.06**	**0.00**	**5.30**	**0.00**	**51.55**	**0.00**	**2.36**	**0.00**	**2.22**	**0.00**	**3.50**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**427.04**	**0.00**	**8109.96**	**0.00**	**1397.09**	**0.00**	**1123.39**	**0.00**	**1306.75**	**0.00**	**805.55**	**0.00**	**4461.03**	**0.00**	**1461.47**	**0.00**	**1072.02**	**0.00**	**14552.36**	**0.00**	**1175.48**	**0.00**	**791.13**	**0.00**	**612.59**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	13.05	0.00	35.71	0.00	5.52	0.00	16.69	0.00	4.21	0.00	4.57	0.00	19.00	0.00	3.42	0.00	9.10	0.00	45.59	0.00	2.62	0.00	2.55	0.00	7.05
Adjusted TP outflow	**lbs/yr**	**0.00**	**6.06**	**0.00**	**31.03**	**0.00**	**4.89**	**0.00**	**8.59**	**0.00**	**4.21**	**0.00**	**3.57**	**0.00**	**18.77**	**0.00**	**7.81**	**0.00**	**5.88**	**0.00**	**57.81**	**0.00**	**2.62**	**0.00**	**2.55**	**0.00**	**3.86**
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	5.88	0.00	0.00	0.00	21.39	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**13.05**	**0.00**	**35.71**	**0.00**	**5.52**	**0.00**	**16.69**	**0.00**	**4.21**	**0.00**	**4.57**	**0.00**	**22.56**	**0.00**	**9.29**	**0.00**	**9.10**	**0.00**	**66.98**	**0.00**	**2.62**	**0.00**	**2.55**	**0.00**	**7.05**
outflow	lbs/yr	0.00	6.06	0.00	31.03	0.00	4.89	0.00	8.59	0.00	4.21	0.00	3.57	0.00	18.77	0.00	7.81	0.00	5.88	0.00	57.81	0.00	2.62	0.00	2.55	0.00	3.86
inflow phos conc	ppb	381.54	434.34	381.54	446.97	381.54	421.79	381.54	445.77	381.54	450.02	381.54	450.02	381.54	430.82	381.54	334.24	381.54	450.02	381.54	413.87	381.54	374.44	381.54	450.02	381.54	450.02
outflow phos conc	ppb	381.54	201.63	381.54	388.50	381.54	373.04	381.54	229.57	381.54	449.91	381.54	351.07	381.54	358.47	381.54	280.97	381.54	290.77	381.54	357.24	381.54	374.33	381.54	449.84	381.54	246.07
p reaction rate	-	1.63	2.49	1.63	0.17	1.63	0.15	1.63	1.83	1.63	0.00	1.63	0.36	1.63	0.24	1.63	0.23	1.63	0.85	1.63	0.18	1.63	0.00	1.63	0.00	1.63	1.52
1-rp	-	1.00	0.46	1.00	0.87	1.00	0.88	1.00	0.51	1.00	1.00	1.00	0.78	1.00	0.83	1.00	0.84	1.00	0.65	1.00	0.86	1.00	1.00	1.00	1.00	1.00	0.55
runoff total p calc	ppb	0.00	427.51	0.00	445.84	0.00	424.86	0.00	446.43	0.00	450.00	0.00	450.00	0.00	450.00	0.00	450.00	0.00	450.00	0.00	436.28	0.00	333.52	0.00	450.00	0.00	450.00

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future BD-9	BD-9	Future BD-90	BD-90	Future EVR-1	EVR-1	Future EVR-2	EVR-2	Future EVR-3	EVR-3	Future EVR-4	EVR-4	Future EVR-5	EVR-5	Future EVR-6	EVR-6	Future EVR-7	EVR-7	Future EVR-8	EVR-8	Future EVR-10	EVR-10	Future EVR-11	EVR-11	Future EVR-12	EVR-12
		BD-9	BD-11	BD-90	BD-9	EVR-1	EVR-13	EVR-2	EVR-7	EVR-3	EVR-LL	EVR-4	EVR-7	EVR-5	EVR-7	EVR-6	EVR-7	EVR-7	EVR-8	EVR-8	EVR-11	EVR-10	EVR-170	EVR-11	EVR-12	EVR-12	EVR-17
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	8.1	0.00	9.0	0.00	19.1	0.00	84.2	0.00	15.8	0.00	84.2	0.00	79.3	0.00	16.6	0.00	79.9	0.00	28.7	0.00	74.1	0.00	15.8	0.00	61.0
Total watershed area (w/o wat	acres	0.00	7.3	0.00	8.2	0.00	18.2	0.00	76.5	0.00	15.4	0.00	83.4	0.00	78.8	0.00	16.0	0.00	79.0	0.00	28.4	0.00	73.6	0.00	15.5	0.00	55.4
basin area	acres	0.00	0.85	0.00	0.83	0.00	0.87	0.00	7.68	0.00	0.43	0.00	0.84	0.00	0.48	0.00	0.58	0.00	0.94	0.00	0.25	0.00	0.46	0.00	0.29	0.00	5.64
basin volume	acre-ft	0.00	1.41	0.00	1.37	0.00	1.48	0.00	35.26	0.00	0.46	0.00	1.40	0.00	0.55	0.00	0.76	0.00	1.04	0.00	0.19	0.00	0.52	0.00	0.24	0.00	9.98
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	96%	0%	26%	0%	39%	0%	97%	0%	25%	0%	90%	0%	96%	0%	24%	0%	93%	0%	87%	0%	89%	0%	96%	0%	89%
Medium Density Residential		0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	38%	0%	3%	0%	0%	0%	1%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	1%	0%	75%	0%	0%	0%	4%	0%	65%	0%	4%	0%	0%	0%	0%	0%	0%	0%	10%
Open Space		0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	13%	0%	0%	0%	4%	0%	1%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	4%	0%	57%	0%	21%	0%	0%	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	15.44	0.00	8.16	0.00	18.23	0.00	76.49	0.00	15.39	0.00	83.38	0.00	78.79	0.00	16.03	0.00	333.66	0.00	362.08	0.00	73.60	0.00	377.59	0.00	432.95
tributary water area	ac	0.00	1.68	0.00	0.83	0.00	0.87	0.00	7.68	0.00	0.43	0.00	0.84	0.00	0.48	0.00	0.58	0.00	10.52	0.00	10.78	0.00	0.46	0.00	11.07	0.00	16.71
direct and ponded area	ac	0.00	17.11	0.00	8.99	0.00	19.10	0.00	84.17	0.00	15.82	0.00	84.22	0.00	79.27	0.00	16.61	0.00	344.18	0.00	372.85	0.00	74.06	0.00	388.66	0.00	449.66
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.81	0.00	396.30	0.00	372.27	0.00	389.55	0.00	286.00	0.00	391.67	0.00	385.29	0.00	279.28	0.00	384.50	0.00	367.10	0.00	391.52	0.00	383.96	0.00	376.16
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.34	0.30	0.30	0.30	0.31	0.30	0.30
unit runoff	in/yr	0.00	7.52	0.00	9.20	0.00	9.32	0.00	7.53	0.00	4.31	0.00	7.71	0.00	7.26	0.00	4.11	0.00	7.39	0.00	6.72	0.00	7.64	0.00	7.22	0.00	6.99
unit export	lbs/ac-y	0.00	0.67	0.00	0.83	0.00	0.79	0.00	0.66	0.00	0.30	0.00	0.68	0.00	0.64	0.00	0.29	0.00	0.65	0.00	0.59	0.00	0.68	0.00	0.64	0.00	0.61
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	4.56	0.00	6.26	0.00	14.16	0.00	47.99	0.00	5.53	0.00	53.57	0.00	47.68	0.00	5.49	0.00	48.64	0.00	15.91	0.00	46.88	0.00	9.33	0.00	32.26
upstream pond	ac-ft/yr	0.00	6.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	154.73	0.00	203.37	0.00	0.00	0.00	219.28	0.00	228.61
total inflow	**ac-ft/yr**	**0.00**	**10.82**	**0.00**	**6.26**	**0.00**	**14.16**	**0.00**	**47.99**	**0.00**	**5.53**	**0.00**	**53.57**	**0.00**	**47.68**	**0.00**	**5.49**	**0.00**	**203.37**	**0.00**	**219.28**	**0.00**	**46.88**	**0.00**	**228.61**	**0.00**	**260.87**
outflow	ac-ft/yr	0.00	10.82	0.00	6.26	0.00	14.16	0.00	47.99	0.00	5.53	0.00	53.57	0.00	47.68	0.00	5.49	0.00	203.37	0.00	219.28	0.00	46.88	0.00	228.61	0.00	260.87
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	4.86	0.00	6.74	0.00	14.34	0.00	50.80	0.00	4.69	0.00	56.99	0.00	50.38	0.00	4.63	0.00	51.18	0.00	16.66	0.00	49.99	0.00	9.89	0.00	33.73
upstream pond	lbs/yr	0.00	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.56	0.00	119.24	0.00	0.00	0.00	131.87	0.00	136.31
total inflow	**lbs/yr**	**0.00**	**8.03**	**0.00**	**6.74**	**0.00**	**14.34**	**0.00**	**50.80**	**0.00**	**4.69**	**0.00**	**56.99**	**0.00**	**50.38**	**0.00**	**4.63**	**0.00**	**139.68**	**0.00**	**135.90**	**0.00**	**49.99**	**0.00**	**141.76**	**0.00**	**170.04**
net sedimentation	lbs/yr	0.00	3.64	0.00	3.57	0.00	7.08	0.00	34.59	0.00	1.87	0.00	22.98	0.00	14.76	0.00	1.97	0.00	20.44	0.00	4.03	0.00	14.39	0.00	5.45	0.00	61.09
outflow	lbs/yr	0.00	4.40	0.00	3.17	0.00	7.26	0.00	16.21	0.00	2.82	0.00	34.01	0.00	35.62	0.00	2.66	0.00	119.24	0.00	131.87	0.00	35.60	0.00	136.31	0.00	108.95
p removal efficiency	%	100.00	45.28	100.00	52.93	100.00	49.37	100.00	68.10	100.00	39.88	100.00	40.33	100.00	29.29	100.00	42.58	100.00	14.63	100.00	2.96	100.00	28.79	100.00	3.84	100.00	35.93
upstream w-shed p load	lbs/yr	0.00	11.60	0.00	6.74	0.00	14.34	0.00	50.80	0.00	4.69	0.00	56.99	0.00	50.38	0.00	4.63	0.00	213.99	0.00	230.64	0.00	49.99	0.00	240.53	0.00	274.26
total removal %	%	100.00	62.11	100.00	52.93	100.00	49.37	100.00	68.10	100.00	39.88	100.00	40.33	100.00	29.29	100.00	42.58	100.00	44.27	100.00	42.82	100.00	28.79	100.00	43.33	100.00	60.28
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.67	1.00	1.65	1.00	1.70	1.00	4.59	1.00	1.07	1.00	1.66	1.00	1.15	1.00	1.31	1.00	1.11	1.00	0.76	1.00	1.13	1.00	0.84	1.00	1.77
relative volume	inches	0.00	10.74	0.00	7.59	0.00	3.62	0.00	25.44	0.00	2.87	0.00	0.90	0.00	0.40	0.00	4.78	0.00	0.74	0.00	0.42	0.00	0.38	0.00	0.91	0.00	10.71
residence time	years	87585.71	0.13	87585.71	0.22	87585.71	0.10	87585.71	0.73	87585.71	0.08	87585.71	0.03	87585.71	0.01	87585.71	0.14	87585.71	0.01	87585.71	0.00	87585.71	0.01	87585.71	0.00	87585.71	0.04
residence time	days	31968784.45	47.74	31968784.45	79.98	31968784.45	38.20	31968784.45	268.16	31968784.45	30.23	31968784.45	9.53	31968784.45	4.24	31968784.45	50.36	31968784.45	1.87	31968784.45	0.32	31968784.45	4.05	31968784.45	0.39	31968784.45	13.96
overflow rate	ft/yr	0.00	12.79	0.00	7.54	0.00	16.27	0.00	6.25	0.00	12.93	0.00	63.77	0.00	99.34	0.00	9.47	0.00	216.35	0.00	866.70	0.00	101.91	0.00	780.24	0.00	46.25
inflow phos conc	ppb	366.44	273.19	366.44	396.51	366.44	372.63	366.44	389.48	366.44	312.17	366.44	391.45	366.44	388.75	366.44	310.23	366.44	252.70	366.44	228.03	366.44	392.35	366.44	228.14	366.44	239.82
outflow phos conc	ppb	366.44	149.50	366.44	186.63	366.44	188.68	366.44	124.26	366.44	187.68	366.44	233.59	366.44	274.88	366.44	178.13	366.44	215.73	366.44	221.27	366.44	279.40	366.44	219.38	366.44	153.66
p reaction rate	-	1.57	1.51	1.57	2.39	1.57	1.93	1.57	6.69	1.57	1.10	1.57	1.13	1.57	0.59	1.57	1.29	1.57	0.20	1.57	0.03	1.57	0.57	1.57	0.04	1.57	0.88
1-rp	-	1.00	0.55	1.00	0.47	1.00	0.51	1.00	0.32	1.00	0.60	1.00	0.60	1.00	0.71	1.00	0.57	1.00	0.85	1.00	0.97	1.00	0.71	1.00	0.96	1.00	0.64
vlawmo pond volume	acre-ft	0.00	0.33	0.00	0.45	0.00	1.02	0.00	3.47	0.00	0.40	0.00	3.87	0.00	3.44	0.00	0.40	0.00	3.51	0.00	1.15	0.00	3.39	0.00	0.67	0.00	2.33
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.81	0.00	396.30	0.00	372.27	0.00	389.55	0.00	286.00	0.00	391.67	0.00	385.29	0.00	279.28	0.00	384.50	0.00	367.10	0.00	391.52	0.00	383.96	0.00	376.16
runoff coefficient		0.00	0.22	0.00	0.27	0.00	0.27	0.00	0.22	0.00	0.12	0.00	0.22	0.00	0.21	0.00	0.12	0.00	0.21	0.00	0.19	0.00	0.22	0.00	0.21	0.00	0.20
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.33	0.00	0.30	0.00	0.34	0.00	0.30	0.00	0.31	0.00	0.30
runoff TSS conc	ppm	0.00	140.00	0.00	140.00	0.00	142.06	0.00	140.48	0.00	196.67	0.00	140.00	0.00	143.34	0.00	197.50	0.00	143.14	0.00	149.68	0.00	140.41	0.00	142.99	0.00	148.05
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	1730.38	0.00	2373.44	0.00	5386.67	0.00	18233.04	0.00	2738.12	0.00	20323.62	0.00	18283.21	0.00	2715.38	0.00	18635.54	0.00	6143.34	0.00	17803.12	0.00	3559.72	0.00	12554.33
upstream pond	lbs/yr	0.00	237.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16064.63	0.00	23794.40	0.00	0.00	0.00	27585.49	0.00	28086.30
total inflow	**lbs/yr**	**0.00**	**1967.73**	**0.00**	**2373.44**	**0.00**	**5386.67**	**0.00**	**18233.04**	**0.00**	**2738.12**	**0.00**	**20323.62**	**0.00**	**18283.21**	**0.00**	**2715.38**	**0.00**	**34700.17**	**0.00**	**29937.74**	**0.00**	**17803.12**	**0.00**	**31145.20**	**0.00**	**40640.63**
p removal efficiency (no inf)	%	0.00	47.00	0.00	54.00	0.00	51.00	0.00	70.00	0.00	42.00	0.00	43.00	0.00	32.00	0.00	44.00	0.00	16.00	0.00	4.00	0.00	31.00	0.00	5.00	0.00	38.00
tss removal efficiency (no inf)	%	0.00	74.00	0.00	90.00	0.00	83.00	0.00	93.00	0.00	68.00	0.00	68.67	0.00	58.50	0.00	69.33	0.00	31.43	0.00	7.86	0.00	57.63	0.00	9.82	0.00	64.00
net sedimentation	lbs/yr	0.00	1456.12	0.00	2136.10	0.00	4470.93	0.00	16956.73	0.00	1861.92	0.00	13955.55	0.00	10695.68	0.00	1882.66	0.00	10905.77	0.00	2352.25	0.00	10259.05	0.00	3058.90	0.00	26010.00
outflow	lbs/yr	0.00	511.61	0.00	237.34	0.00	915.73	0.00	1276.31	0.00	876.20	0.00	6368.07	0.00	7587.53	0.00	832.72	0.00	23794.40	0.00	27585.49	0.00	7544.07	0.00	28086.30	0.00	14630.63
tss removal efficiency (inf)	%	100.00	74.00	100.00	90.00	100.00	83.00	100.00	93.00	100.00	68.00	100.00	68.67	100.00	58.50	100.00	69.33	100.00	31.43	100.00	7.86	100.00	57.63	100.00	9.82	100.00	64.00
upstream watershed tss load	lbs/yr	0.00	4103.83	0.00	2373.44	0.00	5386.67	0.00	18233.04	0.00	2738.12	0.00	20323.62	0.00	18283.21	0.00	2715.38	0.00	78190.79	0.00	84334.13	0.00	17803.12	0.00	87893.85	0.00	100448.17
tss total removal efficiency	%	100.00	87.53	100.00	90.00	100.00	83.00	100.00	93.00	100.00	68.00	100.00	68.67	100.00	58.50	100.00	69.33	100.00	69.57	100.00	67.29	100.00	57.63	100.00	68.05	100.00	85.43
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**10.82**	**0.00**	**6.26**	**0.00**	**14.16**	**0.00**	**47.99**	**0.00**	**5.53**	**0.00**	**53.57**	**0.00**	**47.68**	**0.00**	**5.49**	**0.00**	**203.37**	**0.00**	**219.28**	**0.00**	**46.88**	**0.00**	**228.61**	**0.00**	**260.87**
Adjusted TP outflow	**lbs/yr**	**0.00**	**4.40**	**0.00**	**3.17**	**0.00**	**7.26**	**0.00**	**16.21**	**0.00**	**2.82**	**0.00**	**34.01**	**0.00**	**35.62**	**0.00**	**2.66**	**0.00**	**119.24**	**0.00**	**131.87**	**0.00**	**35.60**	**0.00**	**136.31**	**0.00**	**108.95**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**511.61**	**0.00**	**237.34**	**0.00**	**915.73**	**0.00**	**1276.31**	**0.00**	**876.20**	**0.00**	**6368.07**	**0.00**	**7587.53**	**0.00**	**832.72**	**0.00**	**23794.40**	**0.00**	**27585.49**	**0.00**	**7544.07**	**0.00**	**28086.30**	**0.00**	**14630.63**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	5.55	0.00	7.15	0.00	15.04	0.00	58.11	0.00	5.08	0.00	64.39	0.00	57.81	0.00	5.01	0.00	58.43	0.00	19.10	0.00	56.44	0.00	11.36	0.00	38.61
Adjusted TP outflow	**lbs/yr**	**0.00**	**4.70**	**0.00**	**3.30**	**0.00**	**7.49**	**0.00**	**17.55**	**0.00**	**2.99**	**0.00**	**37.08**	**0.00**	**39.59**	**0.00**	**2.81**	**0.00**	**130.85**	**0.00**	**145.08**	**0.00**	**39.09**	**0.00**	**149.86**	**0.00**	**117.46**
upstream pond	lbs/yr	0.00	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.03	0.00	130.85	0.00	0.00	0.00	145.08	0.00	149.86
total inflow	**lbs/yr**	**0.00**	**8.85**	**0.00**	**7.15**	**0.00**	**15.04**	**0.00**	**58.11**	**0.00**	**5.08**	**0.00**	**64.39**	**0.00**	**57.81**	**0.00**	**5.01**	**0.00**	**155.46**	**0.00**	**149.96**	**0.00**	**56.44**	**0.00**	**156.44**	**0.00**	**188.47**
outflow	lbs/yr	0.00	4.70	0.00	3.30	0.00	7.49	0.00	17.55	0.00	2.99	0.00	37.08	0.00	39.59	0.00	2.81	0.00	130.85	0.00	145.08	0.00	39.09	0.00	149.86	0.00	117.46
inflow phos conc	ppb	381.54	300.95	381.54	420.68	381.54	390.70	381.54	445.50	381.54	337.87	381.54	442.28	381.54	446.10	381.54	336.03	381.54	281.25	381.54	251.61	381.54	443.01	381.54	251.77	381.54	265.81
outflow phos conc	ppb	381.54	159.74	381.54	193.97	381.54	194.74	381.54	134.54	381.54	198.55	381.54	254.66	381.54	305.48	381.54	188.34	381.54	236.73	381.54	243.43	381.54	306.81	381.54	241.17	381.54	165.66
p reaction rate	-	1.63	1.67	1.63	2.53	1.63	2.02	1.63	7.65	1.63	1.19	1.63	1.28	1.63	0.67	1.63	1.40	1.63	0.22	1.63	0.03	1.63	0.64	1.63	0.05	1.63	0.97
1-rp	-	1.00	0.53	1.00	0.46	1.00	0.50	1.00	0.30	1.00	0.59	1.00	0.58	1.00	0.68	1.00	0.56	1.00	0.84	1.00	0.97	1.00	0.69	1.00	0.96	1.00	0.62
runoff total p calc	ppb	0.00	448.16	0.00	421.74	0.00	394.89	0.00	446.17	0.00	300.88	0.00	444.30	0.00	441.22	0.00	293.52	0.00	438.95	0.00	418.14	0.00	443.52	0.00	440.15	0.00	428.43

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

Long Lake

		Future EVR-13	EVR-13	Future EVR-14	EVR-14	Future EVR-15	EVR-15	Future EVR-150	EVR-150	Future EVR-151	EVR-151	Future EVR-16	EVR-16	Future EVR-160	EVR-160	Future EVR-17	EVR-17	Future EVR-170	EVR-170	Future EVR-18	EVR-18	Future EVR-180	EVR-180	Future EVR-19	EVR-19	Future EVR-190	EVR-190
		EVR-13	EVR-17	EVR-14	EVR-17	EVR-15	EVR-LL	EVR-150	EVR-15	EVR-151	EVR-170	EVR-16	EVR-LL	EVR-160	EVR-LL	EVR-17	EVR-35	EVR-170	EVR-17	EVR-18	EVR-210	EVR-180	EVR-18	EVR-19	EVR-210	EVR-190	EVR-19
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	84.3	0.00	25.8	0.00	12.1	0.00	7.8	0.00	23.5	0.00	7.1	0.00	6.8	0.00	83.4	0.00	95.7	0.00	66.3	0.00	13.1	0.00	169.6	0.00	46.5
Total watershed area (w/o wat	acres	0.00	83.8	0.00	23.0	0.00	12.1	0.00	6.8	0.00	23.3	0.00	6.9	0.00	6.7	0.00	49.3	0.00	88.2	0.00	64.1	0.00	12.5	0.00	164.9	0.00	46.4
basin area	acres	0.00	0.60	0.00	2.72	0.00	0.00	0.00	0.99	0.00	0.14	0.00	0.16	0.00	0.13	0.00	34.00	0.00	7.46	0.00	2.22	0.00	0.57	0.00	4.76	0.00	0.12
basin volume	acre-ft	0.00	0.90	0.00	9.91	0.00	0.00	0.00	1.83	0.00	0.07	0.00	0.09	0.00	0.06	0.00	0.00	0.00	10.70	0.00	2.26	0.00	0.73	0.00	13.03	0.00	0.06
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	54%	0%	99%	0%	100%	0%	100%	0%	99%	0%	100%	0%	97%	0%	87%	0%	77%	0%	72%	0%	6%	0%	35%	0%	0%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%	0%	6%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	32%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	8%	0%	92%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	13%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	34%	0%	94%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	18%	0%	0%
Right-of-Way		0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	3%	0%	1%	0%	20%	0%	13%	0%	2%	0%	11%	0%	0%
Minnesota Zoological Gardens		0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	233.33	0.00	23.05	0.00	18.92	0.00	6.79	0.00	23.34	0.00	6.93	0.00	6.68	0.00	923.80	0.00	185.16	0.00	76.62	0.00	12.55	0.00	211.23	0.00	46.38
tributary water area	ac	0.00	10.80	0.00	2.72	0.00	0.99	0.00	0.99	0.00	0.14	0.00	0.16	0.00	0.13	0.00	72.29	0.00	8.06	0.00	2.79	0.00	0.57	0.00	4.88	0.00	0.12
direct and ponded area	ac	0.00	244.13	0.00	25.77	0.00	19.91	0.00	7.78	0.00	23.48	0.00	7.09	0.00	6.81	0.00	996.09	0.00	193.22	0.00	79.41	0.00	13.11	0.00	216.11	0.00	46.50
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	358.86	0.00	389.95	0.00	391.50	0.00	391.50	0.00	391.60	0.00	391.50	0.00	391.77	0.00	375.22	0.00	388.92	0.00	380.22	0.00	353.54	0.00	355.29	0.00	211.47
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.48	0.30	0.58
unit runoff	in/yr	0.00	8.24	0.00	7.40	0.00	7.45	0.00	7.45	0.00	7.47	0.00	7.45	0.00	7.51	0.00	7.02	0.00	7.76	0.00	7.86	0.00	11.35	0.00	5.02	0.00	2.26
unit export	lbs/ac-y	0.00	0.68	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.67	0.00	0.61	0.00	0.69	0.00	0.69	0.00	0.91	0.00	0.44	0.00	0.13
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	57.54	0.00	14.21	0.00	7.53	0.00	4.21	0.00	14.53	0.00	4.30	0.00	4.18	0.00	28.83	0.00	57.04	0.00	41.96	0.00	11.87	0.00	69.00	0.00	8.74
upstream pond	ac-ft/yr	0.00	95.65	0.00	0.00	0.00	4.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	546.72	0.00	61.40	0.00	11.87	0.00	0.00	0.00	8.74	0.00	0.00
total inflow	**ac-ft/yr**	**0.00**	**153.19**	**0.00**	**14.21**	**0.00**	**11.74**	**0.00**	**4.21**	**0.00**	**14.53**	**0.00**	**4.30**	**0.00**	**4.18**	**0.00**	**575.55**	**0.00**	**118.44**	**0.00**	**53.83**	**0.00**	**11.87**	**0.00**	**77.74**	**0.00**	**8.74**
outflow	ac-ft/yr	0.00	153.19	0.00	14.21	0.00	11.74	0.00	4.21	0.00	14.53	0.00	4.30	0.00	4.18	0.00	575.55	0.00	118.44	0.00	53.83	0.00	11.87	0.00	77.74	0.00	8.74
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	57.08	0.00	15.10	0.00	8.01	0.00	4.48	0.00	15.46	0.00	4.58	0.00	4.46	0.00	30.07	0.00	60.76	0.00	43.99	0.00	11.37	0.00	72.97	0.00	6.03
upstream pond	lbs/yr	0.00	30.66	0.00	0.00	0.00	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	248.89	0.00	48.37	0.00	6.50	0.00	0.00	0.00	5.53	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**87.75**	**0.00**	**15.10**	**0.00**	**10.00**	**0.00**	**4.48**	**0.00**	**15.46**	**0.00**	**4.58**	**0.00**	**4.46**	**0.00**	**278.96**	**0.00**	**109.13**	**0.00**	**50.49**	**0.00**	**11.37**	**0.00**	**78.50**	**0.00**	**6.03**
net sedimentation	lbs/yr	0.00	12.68	0.00	9.87	0.00	0.00	0.00	2.49	0.00	2.70	0.00	1.34	0.00	1.16	0.00	0.00	0.00	49.49	0.00	18.60	0.00	4.87	0.00	39.24	0.00	0.50
outflow	lbs/yr	0.00	75.07	0.00	5.23	0.00	10.00	0.00	1.99	0.00	12.77	0.00	3.24	0.00	3.30	0.00	278.96	0.00	59.64	0.00	31.89	0.00	6.50	0.00	39.27	0.00	5.53
p removal efficiency	%	0.00	14.45	100.00	65.35	100.00	0.00	100.00	55.65	100.00	17.43	100.00	29.21	100.00	25.96	0.00	0.00	100.00	45.35	100.00	36.84	100.00	42.85	100.00	49.98	100.00	8.22
upstream w-shed p load	lbs/yr	0.00	157.20	0.00	15.10	0.00	12.49	0.00	4.48	0.00	15.46	0.00	4.58	0.00	4.46	0.00	602.84	0.00	126.22	0.00	55.36	0.00	11.37	0.00	79.00	0.00	6.03
total removal %	%	0.00	52.25	100.00	65.35	100.00	19.97	100.00	55.65	100.00	17.43	100.00	29.21	100.00	25.96	0.00	53.73	100.00	52.75	100.00	42.40	100.00	42.85	100.00	50.30	100.00	8.22
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.50	1.00	3.64	1.00	0.10	1.00	1.85	1.00	0.52	1.00	0.56	1.00	0.49	1.00	0.00	1.00	1.43	1.00	1.02	1.00	1.29	1.00	2.74	1.00	0.47
relative volume	inches	0.00	0.54	0.00	24.14	0.00	0.00	0.00	15.08	0.00	0.17	0.00	0.72	0.00	0.53	0.00	0.00	0.00	6.49	0.00	1.86	0.00	2.13	0.00	6.54	0.00	0.22
residence time	years	87585.71	0.01	87585.71	0.70	87585.71	0.00	87585.71	0.44	87585.71	0.00	87585.71	0.02	87585.71	0.02	87585.71	0.00	87585.71	0.09	87585.71	0.04	87585.71	0.06	87585.71	0.17	87585.71	0.01
residence time	days	31968784.45	2.14	31968784.45	254.47	31968784.45	0.00	31968784.45	159.04	31968784.45	1.81	31968784.45	7.64	31968784.45	5.57	31968784.45	0.00	31968784.45	32.97	31968784.45	15.32	31968784.45	22.44	31968784.45	61.18	31968784.45	2.33
overflow rate	ft/yr	0.00	255.32	0.00	5.23	0.00	117387.95	0.00	4.25	0.00	103.77	0.00	26.88	0.00	32.19	0.00	16.93	0.00	15.87	0.00	24.25	0.00	20.93	0.00	16.33	0.00	72.84
inflow phos conc	ppb	366.44	210.73	366.44	390.84	366.44	313.36	366.44	391.52	366.44	391.64	366.44	391.52	366.44	391.86	366.44	178.32	366.44	338.99	366.44	345.09	366.44	352.53	366.44	371.53	366.44	253.72
outflow phos conc	ppb	366.44	180.29	366.44	135.44	366.44	313.34	366.44	173.64	366.44	323.39	366.44	277.15	366.44	290.12	366.44	178.32	366.44	185.26	366.44	217.96	366.44	201.47	366.44	185.83	366.44	232.85
p reaction rate	-	1.57	0.20	1.57	5.44	1.57	0.00	1.57	2.83	1.57	0.26	1.57	0.58	1.57	0.47	1.57	0.00	1.57	1.52	1.57	0.92	1.57	1.31	1.57	2.00	1.57	0.10
1-rp	-	1.00	0.86	1.00	0.35	1.00	1.00	1.00	0.44	1.00	0.83	1.00	0.71	1.00	0.74	1.00	1.00	1.00	0.55	1.00	0.63	1.00	0.57	1.00	0.50	1.00	0.92
vlawmo pond volume	acre-ft	0.00	4.16	0.00	1.03	0.00	0.54	0.00	0.30	0.00	1.05	0.00	0.31	0.00	0.30	0.00	2.08	0.00	4.12	0.00	3.03	0.00	0.86	0.00	4.98	0.00	0.63
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	358.86	0.00	389.95	0.00	391.50	0.00	391.50	0.00	391.60	0.00	391.50	0.00	391.77	0.00	375.22	0.00	388.92	0.00	380.22	0.00	353.54	0.00	355.29	0.00	211.47
runoff coefficient		0.00	0.24	0.00	0.21	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.20	0.00	0.22	0.00	0.23	0.00	0.33	0.00	0.15	0.00	0.07
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.48	0.00	0.58
runoff TSS conc	ppm	0.00	150.42	0.00	140.83	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	148.65	0.00	142.18	0.00	143.52	0.00	140.00	0.00	179.86	0.00	211.45
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	22485.32	0.00	5407.05	0.00	2855.95	0.00	1597.75	0.00	5511.85	0.00	1631.89	0.00	1587.62	0.00	11250.20	0.00	21771.32	0.00	16008.56	0.00	4502.58	0.00	29522.63	0.00	4611.51
upstream pond	lbs/yr	0.00	1949.40	0.00	0.00	0.00	111.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39603.21	0.00	10890.55	0.00	1410.81	0.00	0.00	0.00	3796.26	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**24434.72**	**0.00**	**5407.05**	**0.00**	**2967.80**	**0.00**	**1597.75**	**0.00**	**5511.85**	**0.00**	**1631.89**	**0.00**	**1587.62**	**0.00**	**50853.40**	**0.00**	**32661.87**	**0.00**	**17419.37**	**0.00**	**4502.58**	**0.00**	**33318.90**	**0.00**	**4611.51**
p removal efficiency (no inf)	%	0.00	16.00	0.00	68.00	0.00	0.00	0.00	58.00	0.00	20.00	0.00	32.00	0.00	29.00	0.00	0.00	0.00	48.00	0.00	39.00	0.00	43.00	0.00	52.00	0.00	9.00
tss removal efficiency (no inf)	%	0.00	31.43	0.00	93.00	0.00	0.00	0.00	93.00	0.00	39.29	0.00	58.50	0.00	55.88	0.00	0.00	0.00	76.00	0.00	65.00	0.00	68.67	0.00	85.00	0.00	17.68
net sedimentation	lbs/yr	0.00	7679.48	0.00	5028.56	0.00	0.00	0.00	1485.91	0.00	2165.37	0.00	954.66	0.00	887.08	0.00	0.00	0.00	24823.02	0.00	11322.59	0.00	3091.77	0.00	28321.06	0.00	815.25
outflow	lbs/yr	0.00	16755.24	0.00	378.49	0.00	2967.80	0.00	111.84	0.00	3346.48	0.00	677.23	0.00	700.54	0.00	50853.40	0.00	7838.85	0.00	6096.78	0.00	1410.81	0.00	4997.83	0.00	3796.26
tss removal efficiency (inf)	%	0.00	31.43	100.00	93.00	100.00	0.00	100.00	93.00	100.00	39.29	100.00	58.50	100.00	55.88	0.00	0.00	100.00	76.00	100.00	65.00	100.00	68.67	100.00	85.00	100.00	17.68
upstream watershed tss load	lbs/yr	0.00	59504.32	0.00	5407.05	0.00	4453.70	0.00	1597.75	0.00	5511.85	0.00	1631.89	0.00	1587.62	0.00	221696.03	0.00	45086.29	0.00	20511.15	0.00	4502.58	0.00	34134.14	0.00	4611.51
tss total removal efficiency	%	0.00	71.84	100.00	93.00	100.00	33.36	100.00	93.00	100.00	39.29	100.00	58.50	100.00	55.88	0.00	77.06	100.00	82.61	100.00	70.28	100.00	68.67	100.00	85.36	100.00	17.68
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**153.19**	**0.00**	**14.21**	**0.00**	**11.74**	**0.00**	**4.21**	**0.00**	**14.53**	**0.00**	**4.30**	**0.00**	**4.18**	**0.00**	**575.55**	**0.00**	**118.44**	**0.00**	**53.83**	**0.00**	**11.87**	**0.00**	**77.74**	**0.00**	**8.74**
Adjusted TP outflow	**lbs/yr**	**0.00**	**75.07**	**0.00**	**5.23**	**0.00**	**10.00**	**0.00**	**1.99**	**0.00**	**12.77**	**0.00**	**3.24**	**0.00**	**3.30**	**0.00**	**278.96**	**0.00**	**59.64**	**0.00**	**31.89**	**0.00**	**6.50**	**0.00**	**39.27**	**0.00**	**5.53**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**16755.24**	**0.00**	**378.49**	**0.00**	**2967.80**	**0.00**	**111.84**	**0.00**	**3346.48**	**0.00**	**677.23**	**0.00**	**700.54**	**0.00**	**50853.40**	**0.00**	**7838.85**	**0.00**	**6096.78**	**0.00**	**1410.81**	**0.00**	**4997.83**	**0.00**	**3796.26**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	61.51	0.00	17.35	0.00	9.21	0.00	5.15	0.00	17.74	0.00	5.26	0.00	5.10	0.00	34.30	0.00	67.43	0.00	48.69	0.00	11.45	0.00	79.13	0.00	6.41
Adjusted TP outflow	**lbs/yr**	**0.00**	**79.32**	**0.00**	**5.69**	**0.00**	**11.38**	**0.00**	**2.17**	**0.00**	**14.34**	**0.00**	**3.61**	**0.00**	**3.67**	**0.00**	**300.72**	**0.00**	**63.95**	**0.00**	**34.03**	**0.00**	**6.53**	**0.00**	**41.39**	**0.00**	**5.86**
upstream pond	lbs/yr	0.00	31.96	0.00	0.00	0.00	2.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	266.42	0.00	53.43	0.00	6.53	0.00	0.00	0.00	5.86	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**93.47**	**0.00**	**17.35**	**0.00**	**11.38**	**0.00**	**5.15**	**0.00**	**17.74**	**0.00**	**5.26**	**0.00**	**5.10**	**0.00**	**300.72**	**0.00**	**120.86**	**0.00**	**55.22**	**0.00**	**11.45**	**0.00**	**84.99**	**0.00**	**6.41**
outflow	lbs/yr	0.00	79.32	0.00	5.69	0.00	11.38	0.00	2.17	0.00	14.34	0.00	3.61	0.00	3.67	0.00	300.72	0.00	63.95	0.00	34.03	0.00	6.53	0.00	41.39	0.00	5.86
inflow phos conc	ppb	381.54	224.48	381.54	449.06	381.54	356.66	381.54	450.02	381.54	449.30	381.54	450.02	381.54	448.03	381.54	192.24	381.54	375.43	381.54	377.39	381.54	354.88	381.54	402.23	381.54	270.03
outflow phos conc	ppb	381.54	190.49	381.54	147.24	381.54	356.64	381.54	189.77	381.54	363.21	381.54	308.41	381.54	322.40	381.54	192.24	381.54	198.66	381.54	232.61	381.54	202.41	381.54	195.89	381.54	246.63
p reaction rate	-	1.63	0.21	1.63	6.25	1.63	0.00	1.63	3.25	1.63	0.29	1.63	0.67	1.63	0.54	1.63	0.00	1.63	1.68	1.63	1.01	1.63	1.32	1.63	2.16	1.63	0.10
1-rp	-	1.00	0.85	1.00	0.33	1.00	1.00	1.00	0.42	1.00	0.81	1.00	0.69	1.00	0.72	1.00	1.00	1.00	0.53	1.00	0.62	1.00	0.57	1.00	0.49	1.00	0.91
runoff total p calc	ppb	0.00	390.22	0.00	447.81	0.00	450.00	0.00	450.00	0.00	449.43	0.00	450.00	0.00	448.44	0.00	426.11	0.00	433.72	0.00	423.33	0.00	357.13	0.00	376.85	0.00	214.95

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future EVR-20	EVR-20	Future EVR-21	EVR-21	Future EVR-210	EVR-210	Future EVR-211	EVR-211	Future EVR-22	EVR-22	Future EVR-220	EVR-220	Future EVR-221	EVR-221	Future EVR-24	EVR-24	Future EVR-25	EVR-25	Future EVR-26	EVR-26	Future EVR-27	EVR-27	Future EVR-28	EVR-28	Future EVR-280	EVR-280
		EVR-20	EVR-210	EVR-21	EVR-35	EVR-210	EVR-21	EVR-211	EVR-210	EVR-22	EVR-350	EVR-220	EVR-22	EVR-221	EVR-220	EVR-24	EVR-26	EVR-25	EVR-26	EVR-26	EVR-29	EVR-27	EVR-29	EVR-28	EVR-LL	EVR-280	EVR-LL
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	29.3	0.00	63.9	0.00	57.8	0.00	6.0	0.00	36.4	0.00	3.6	0.00	7.0	0.00	11.9	0.00	14.3	0.00	78.3	0.00	90.7	0.00	5.7	0.00	6.2
Total watershed area (w/o wat	acres	0.00	27.7	0.00	62.6	0.00	57.1	0.00	6.0	0.00	33.5	0.00	3.3	0.00	7.0	0.00	11.8	0.00	14.1	0.00	76.3	0.00	90.2	0.00	5.7	0.00	5.7
basin area	acres	0.00	1.61	0.00	1.31	0.00	0.75	0.00	0.00	0.00	2.85	0.00	0.33	0.00	0.00	0.00	0.12	0.00	0.19	0.00	2.00	0.00	0.50	0.00	0.09	0.00	0.47
basin volume	acre-ft	0.00	4.12	0.00	3.64	0.00	0.80	0.00	0.00	0.00	8.55	0.00	0.30	0.00	0.00	0.00	0.06	0.00	0.12	0.00	5.10	0.00	0.59	0.00	0.03	0.00	0.54
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	100%	0%	72%	0%	91%	0%	0%	0%	99%	0%	72%	0%	0%	0%	100%	0%	2%	0%	57%	0%	89%	0%	94%	0%	83%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	17%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	0%	32%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	9%	0%	6%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	11%	0%	3%	0%	0%	0%	1%	0%	28%	0%	16%	0%	0%	0%	1%	0%	2%	0%	1%	0%	6%	0%	17%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	27.70	0.00	441.17	0.00	378.60	0.00	5.99	0.00	44.62	0.00	10.31	0.00	6.99	0.00	11.77	0.00	14.12	0.00	102.23	0.00	90.19	0.00	5.66	0.00	5.69
tributary water area	ac	0.00	1.61	0.00	11.34	0.00	10.03	0.00	0.00	0.00	3.18	0.00	0.33	0.00	0.00	0.00	0.12	0.00	0.19	0.00	2.31	0.00	0.50	0.00	0.09	0.00	0.47
direct and ponded area	ac	0.00	29.31	0.00	452.51	0.00	388.63	0.00	5.99	0.00	47.80	0.00	10.64	0.00	6.99	0.00	11.89	0.00	14.31	0.00	104.54	0.00	90.69	0.00	5.75	0.00	6.16
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.51	0.00	392.35	0.00	391.78	0.00	370.89	0.00	391.56	0.00	393.86	0.00	525.65	0.00	391.50	0.00	338.68	0.00	365.24	0.00	375.13	0.00	392.05	0.00	392.91
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.30	0.30	0.64	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.45	0.00	8.94	0.00	7.96	0.00	9.64	0.00	7.46	0.00	8.03	0.00	4.27	0.00	7.45	0.00	10.48	0.00	8.43	0.00	6.98	0.00	7.58	0.00	7.80
unit export	lbs/ac-y	0.00	0.66	0.00	0.79	0.00	0.71	0.00	0.85	0.00	0.66	0.00	0.72	0.00	0.48	0.00	0.66	0.00	0.82	0.00	0.70	0.00	0.61	0.00	0.67	0.00	0.69
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	17.20	0.00	46.61	0.00	37.83	0.00	4.82	0.00	20.85	0.00	2.22	0.00	2.48	0.00	7.30	0.00	12.34	0.00	53.62	0.00	52.48	0.00	3.57	0.00	3.70
upstream pond	ac-ft/yr	0.00	0.00	0.00	191.41	0.00	153.58	0.00	0.00	0.00	5.20	0.00	2.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.64	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**0.00**	**17.20**	**0.00**	**238.03**	**0.00**	**191.41**	**0.00**	**4.82**	**0.00**	**26.04**	**0.00**	**4.71**	**0.00**	**2.48**	**0.00**	**7.30**	**0.00**	**12.34**	**0.00**	**73.26**	**0.00**	**52.48**	**0.00**	**3.57**	**0.00**	**3.70**
outflow	ac-ft/yr	0.00	17.20	0.00	238.03	0.00	191.41	0.00	4.82	0.00	26.04	0.00	4.71	0.00	2.48	0.00	7.30	0.00	12.34	0.00	73.26	0.00	52.48	0.00	3.57	0.00	3.70
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	18.30	0.00	49.73	0.00	40.29	0.00	5.08	0.00	22.19	0.00	2.38	0.00	3.35	0.00	7.77	0.00	11.64	0.00	53.72	0.00	55.02	0.00	3.81	0.00	3.95
upstream pond	lbs/yr	0.00	0.00	0.00	108.90	0.00	83.79	0.00	0.00	0.00	3.80	0.00	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.19	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**18.30**	**0.00**	**158.62**	**0.00**	**124.08**	**0.00**	**5.08**	**0.00**	**25.99**	**0.00**	**5.73**	**0.00**	**3.35**	**0.00**	**7.77**	**0.00**	**11.64**	**0.00**	**68.90**	**0.00**	**55.02**	**0.00**	**3.81**	**0.00**	**3.95**
net sedimentation	lbs/yr	0.00	10.74	0.00	45.52	0.00	15.19	0.00	0.00	0.00	15.74	0.00	2.45	0.00	0.00	0.00	1.60	0.00	2.62	0.00	34.73	0.00	15.59	0.00	0.80	0.00	1.84
outflow	lbs/yr	0.00	7.56	0.00	113.11	0.00	108.90	0.00	5.08	0.00	10.25	0.00	3.28	0.00	3.35	0.00	6.17	0.00	9.02	0.00	34.18	0.00	39.43	0.00	3.01	0.00	2.11
p removal efficiency	%	100.00	58.68	100.00	28.70	100.00	12.24	100.00	0.01	100.00	60.57	100.00	42.75	100.00	0.02	100.00	20.56	100.00	22.54	100.00	50.40	100.00	28.33	100.00	21.10	100.00	46.48
upstream w-shed p load	lbs/yr	0.00	18.30	0.00	247.76	0.00	198.03	0.00	5.08	0.00	28.44	0.00	5.73	0.00	3.35	0.00	7.77	0.00	11.64	0.00	73.13	0.00	55.02	0.00	3.81	0.00	3.95
total removal %	%	100.00	58.68	100.00	54.35	100.00	45.01	100.00	0.01	100.00	63.97	100.00	42.75	100.00	0.02	100.00	20.56	100.00	22.54	100.00	53.26	100.00	28.33	100.00	21.10	100.00	46.48
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	2.55	1.00	2.78	1.00	1.07	1.00	0.10	1.00	3.00	1.00	0.90	1.00	0.10	1.00	0.47	1.00	0.63	1.00	2.55	1.00	1.19	1.00	0.39	1.00	1.14
relative volume	inches	0.00	8.29	0.00	2.70	0.00	0.73	0.00	0.00	0.00	14.20	0.00	4.65	0.00	0.00	0.00	0.27	0.00	0.34	0.00	3.29	0.00	0.39	0.00	0.34	0.00	5.01
residence time	years	87585.71	0.24	87585.71	0.02	87585.71	0.00	87585.71	0.00	87585.71	0.33	87585.71	0.06	87585.71	0.00	87585.71	0.01	87585.71	0.01	87585.71	0.07	87585.71	0.01	87585.71	0.01	87585.71	0.14
residence time	days	31968784.45	87.43	31968784.45	5.58	31968784.45	1.53	31968784.45	0.00	31968784.45	119.83	31968784.45	23.12	31968784.45	0.00	31968784.45	2.79	31968784.45	3.54	31968784.45	25.41	31968784.45	4.12	31968784.45	3.55	31968784.45	52.84
overflow rate	ft/yr	0.00	10.65	0.00	181.70	0.00	255.22	0.00	48161.88	0.00	9.14	0.00	14.26	0.00	24846.17	0.00	60.85	0.00	64.93	0.00	36.63	0.00	104.95	0.00	39.72	0.00	7.86
inflow phos conc	ppb	366.44	391.54	366.44	245.18	366.44	238.51	366.44	387.82	366.44	367.15	366.44	447.72	366.44	495.54	366.44	391.52	366.44	347.12	366.44	346.04	366.44	385.74	366.44	392.21	366.44	393.25
outflow phos conc	ppb	366.44	161.79	366.44	174.83	366.44	209.31	366.44	387.77	366.44	144.76	366.44	256.34	366.44	495.46	366.44	311.01	366.44	268.89	366.44	171.64	366.44	276.46	366.44	309.45	366.44	210.46
p reaction rate	-	1.57	3.44	1.57	0.56	1.57	0.16	1.57	0.00	1.57	3.90	1.57	1.30	1.57	0.00	1.57	0.33	1.57	0.38	1.57	2.05	1.57	0.55	1.57	0.34	1.57	1.62
1-rp	-	1.00	0.41	1.00	0.71	1.00	0.88	1.00	1.00	1.00	0.39	1.00	0.57	1.00	1.00	1.00	0.79	1.00	0.77	1.00	0.50	1.00	0.72	1.00	0.79	1.00	0.54
vlawmo pond volume	acre-ft	0.00	1.24	0.00	3.37	0.00	2.73	0.00	0.35	0.00	1.51	0.00	0.16	0.00	0.18	0.00	0.53	0.00	0.89	0.00	3.87	0.00	3.79	0.00	0.26	0.00	0.27
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.51	0.00	392.35	0.00	391.78	0.00	370.89	0.00	391.56	0.00	393.86	0.00	525.65	0.00	391.50	0.00	338.68	0.00	365.24	0.00	375.13	0.00	392.05	0.00	392.91
runoff coefficient		0.00	0.22	0.00	0.26	0.00	0.23	0.00	0.28	0.00	0.22	0.00	0.23	0.00	0.12	0.00	0.22	0.00	0.30	0.00	0.24	0.00	0.20	0.00	0.22	0.00	0.23
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.33	0.00	0.30	0.00	0.30	0.00	0.64	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	140.00	0.00	140.04	0.00	140.00	0.00	148.18	0.00	140.00	0.00	140.00	0.00	203.66	0.00	140.00	0.00	149.59	0.00	147.13	0.00	147.73	0.00	140.00	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	6524.19	0.00	17687.15	0.00	14352.27	0.00	1846.43	0.00	7909.80	0.00	842.66	0.00	1268.54	0.00	2770.25	0.00	4779.98	0.00	20738.87	0.00	20322.21	0.00	1356.32	0.00	1402.19
upstream pond	lbs/yr	0.00	0.00	0.00	20118.75	0.00	13397.74	0.00	0.00	0.00	833.46	0.00	1268.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4139.14	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**6524.19**	**0.00**	**37805.90**	**0.00**	**27750.00**	**0.00**	**1846.43**	**0.00**	**8743.26**	**0.00**	**2111.20**	**0.00**	**1268.54**	**0.00**	**2770.25**	**0.00**	**4779.98**	**0.00**	**24878.01**	**0.00**	**20322.21**	**0.00**	**1356.32**	**0.00**	**1402.19**
p removal efficiency (no inf)	%	0.00	61.00	0.00	31.00	0.00	14.00	0.00	0.00	0.00	63.00	0.00	44.00	0.00	0.00	0.00	23.00	0.00	23.00	0.00	52.00	0.00	31.00	0.00	23.00	0.00	49.00
tss removal efficiency (no inf)	%	0.00	93.00	0.00	57.63	0.00	27.50	0.00	0.00	0.00	93.00	0.00	69.33	0.00	0.00	0.00	45.18	0.00	45.18	0.00	85.00	0.00	57.63	0.00	45.18	0.00	78.50
net sedimentation	lbs/yr	0.00	6067.50	0.00	21785.65	0.00	7631.25	0.00	0.00	0.00	8131.24	0.00	1463.77	0.00	0.00	0.00	1251.56	0.00	2159.53	0.00	21146.31	0.00	11710.67	0.00	612.77	0.00	1100.72
outflow	lbs/yr	0.00	456.69	0.00	16020.25	0.00	20118.75	0.00	1846.43	0.00	612.03	0.00	647.44	0.00	1268.54	0.00	1518.69	0.00	2620.45	0.00	3731.70	0.00	8611.54	0.00	743.55	0.00	301.47
tss removal efficiency (inf)	%	100.00	93.00	100.00	57.63	100.00	27.50	100.00	0.00	100.00	93.00	100.00	69.33	100.00	0.00	100.00	45.18	100.00	45.18	100.00	85.00	100.00	57.63	100.00	45.18	100.00	78.50
upstream watershed tss load	lbs/yr	0.00	6524.19	0.00	95055.33	0.00	77368.18	0.00	1846.43	0.00	10207.03	0.00	2111.20	0.00	1268.54	0.00	2770.25	0.00	4779.98	0.00	28289.10	0.00	20322.21	0.00	1356.32	0.00	1402.19
tss total removal efficiency	%	100.00	93.00	100.00	83.15	100.00	74.00	100.00	0.00	100.00	94.00	100.00	69.33	100.00	0.00	100.00	45.18	100.00	45.18	100.00	86.81	100.00	57.63	100.00	45.18	100.00	78.50
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**17.20**	**0.00**	**238.03**	**0.00**	**191.41**	**0.00**	**4.82**	**0.00**	**26.04**	**0.00**	**4.71**	**0.00**	**2.48**	**0.00**	**7.30**	**0.00**	**12.34**	**0.00**	**73.26**	**0.00**	**52.48**	**0.00**	**3.57**	**0.00**	**3.70**
Adjusted TP outflow	**lbs/yr**	**0.00**	**7.56**	**0.00**	**113.11**	**0.00**	**108.90**	**0.00**	**5.08**	**0.00**	**10.25**	**0.00**	**3.28**	**0.00**	**3.35**	**0.00**	**6.17**	**0.00**	**9.02**	**0.00**	**34.18**	**0.00**	**39.43**	**0.00**	**3.01**	**0.00**	**2.11**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**456.69**	**0.00**	**16020.25**	**0.00**	**20118.75**	**0.00**	**1846.43**	**0.00**	**612.03**	**0.00**	**647.44**	**0.00**	**1268.54**	**0.00**	**1518.69**	**0.00**	**2620.45**	**0.00**	**3731.70**	**0.00**	**8611.54**	**0.00**	**743.55**	**0.00**	**301.47**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	21.03	0.00	56.28	0.00	46.07	0.00	5.83	0.00	25.47	0.00	2.62	0.00	3.35	0.00	8.93	0.00	11.67	0.00	57.98	0.00	62.90	0.00	4.33	0.00	4.42
Adjusted TP outflow	**lbs/yr**	**0.00**	**8.25**	**0.00**	**121.53**	**0.00**	**117.80**	**0.00**	**5.83**	**0.00**	**11.07**	**0.00**	**3.37**	**0.00**	**3.35**	**0.00**	**6.92**	**0.00**	**9.04**	**0.00**	**35.81**	**0.00**	**43.73**	**0.00**	**3.34**	**0.00**	**2.28**
upstream pond	lbs/yr	0.00	0.00	0.00	117.80	0.00	89.50	0.00	0.00	0.00	3.97	0.00	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.96	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**21.03**	**0.00**	**174.08**	**0.00**	**135.57**	**0.00**	**5.83**	**0.00**	**29.44**	**0.00**	**5.96**	**0.00**	**3.35**	**0.00**	**8.93**	**0.00**	**11.67**	**0.00**	**73.93**	**0.00**	**62.90**	**0.00**	**4.33**	**0.00**	**4.42**
outflow	lbs/yr	0.00	8.25	0.00	121.53	0.00	117.80	0.00	5.83	0.00	11.07	0.00	3.37	0.00	3.35	0.00	6.92	0.00	9.04	0.00	35.81	0.00	43.73	0.00	3.34	0.00	2.28
inflow phos conc	ppb	381.54	449.91	381.54	269.07	381.54	260.57	381.54	445.17	381.54	415.94	381.54	466.23	381.54	495.55	381.54	450.02	381.54	348.00	381.54	371.30	381.54	441.04	381.54	445.94	381.54	439.86
outflow phos conc	ppb	381.54	176.50	381.54	187.84	381.54	226.42	381.54	445.10	381.54	156.38	381.54	263.70	381.54	495.46	381.54	348.77	381.54	269.44	381.54	179.84	381.54	306.62	381.54	343.78	381.54	227.07
p reaction rate	-	1.63	3.95	1.63	0.62	1.63	0.17	1.63	0.00	1.63	4.41	1.63	1.36	1.63	0.00	1.63	0.37	1.63	0.38	1.63	2.20	1.63	0.63	1.63	0.39	1.63	1.82
1-rp	-	1.00	0.39	1.00	0.70	1.00	0.87	1.00	1.00	1.00	0.38	1.00	0.57	1.00	1.00	1.00	0.78	1.00	0.77	1.00	0.48	1.00	0.70	1.00	0.77	1.00	0.52
runoff total p calc	ppb	0.00	449.91	0.00	444.49	0.00	448.34	0.00	423.07	0.00	449.62	0.00	436.12	0.00	525.65	0.00	450.00	0.00	339.91	0.00	398.33	0.00	426.98	0.00	446.75	0.00	441.70

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

Farquar Lake

		Future EVR-29	EVR-29	Future EVR-290	EVR-290	Future EVR-30	EVR-30	Future EVR-31	EVR-31	Future EVR-32	EVR-32	Future EVR-33	EVR-33	Future EVR-34	EVR-34	Future EVR-35	EVR-35	Future EVR-350	EVR-350	Future EVR-351	EVR-351	Future EVR-352	EVR-352	Future EVR-36	EVR-36	Future EVR-37	EVR-37
		EVR-29	EVR-352	EVR-290	EVR-352	EVR-30	EVR-352	EVR-31	EVR-352	EVR-32	EVR-352	EVR-33	EVR-LL	EVR-34	EVR-LL	EVR-35	EVR-39	EVR-350	EVR-35	EVR-351	EVR-352	EVR-352	EVR-35	EVR-36	EVR-37	EVR-37	EVR-39
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	113.0	0.00	9.5	0.00	37.8	0.00	6.1	0.00	2.8	0.00	7.1	0.00	14.2	0.00	142.2	0.00	42.4	0.00	21.5	0.00	6.8	0.00	79.8	0.00	25.4
Total watershed area (w/o wat	acres	0.00	110.8	0.00	8.9	0.00	36.9	0.00	6.0	0.00	2.5	0.00	5.9	0.00	12.3	0.00	75.2	0.00	42.2	0.00	21.5	0.00	4.8	0.00	79.1	0.00	25.3
basin area	acres	0.00	2.23	0.00	0.61	0.00	0.85	0.00	0.13	0.00	0.33	0.00	1.25	0.00	1.89	0.00	67.00	0.00	0.20	0.00	0.00	0.00	2.01	0.00	0.64	0.00	0.17
basin volume	acre-ft	0.00	9.32	0.00	0.82	0.00	1.43	0.00	0.06	0.00	0.30	0.00	2.70	0.00	5.35	0.00	0.00	0.00	0.13	0.00	0.00	0.00	3.65	0.00	1.36	0.00	0.10
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	82%	0%	100%	0%	100%	0%	91%	0%	84%	0%	100%	0%	99%	0%	82%	0%	78%	0%	97%	0%	90%	0%	66%	0%	55%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	4%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	0%	11%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	21%	0%	0%	0%	0%	0%	3%	0%	0%
Open Space		0%	8%	0%	0%	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	10%	0%	0%	0%	0%	0%	0%	0%	16%	0%	0%	0%	1%	0%	8%	0%	1%	0%	2%	0%	10%	0%	7%	0%	19%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	303.21	0.00	8.89	0.00	36.92	0.00	5.99	0.00	2.45	0.00	5.88	0.00	12.27	0.00	1910.71	0.00	86.83	0.00	21.53	0.00	383.75	0.00	79.14	0.00	104.42
tributary water area	ac	0.00	5.04	0.00	0.61	0.00	0.85	0.00	0.13	0.00	0.33	0.00	1.25	0.00	1.89	0.00	162.98	0.00	3.38	0.00	0.00	0.00	8.97	0.00	0.64	0.00	0.81
direct and ponded area	ac	0.00	308.25	0.00	9.50	0.00	37.77	0.00	6.13	0.00	2.79	0.00	7.13	0.00	14.16	0.00	2073.69	0.00	90.20	0.00	21.53	0.00	392.72	0.00	79.79	0.00	105.24
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	377.06	0.00	391.50	0.00	391.50	0.00	373.35	0.00	392.85	0.00	391.50	0.00	391.56	0.00	377.94	0.00	361.91	0.00	389.70	0.00	392.33	0.00	377.66	0.00	388.45
runoff ortho p/total p	-	0.30	0.32	0.30	0.30	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.20	0.00	7.45	0.00	7.45	0.00	6.91	0.00	7.78	0.00	7.45	0.00	7.46	0.00	7.20	0.00	6.58	0.00	7.43	0.00	7.65	0.00	8.44	0.00	9.23
unit export	lbs/ac-y	0.00	0.63	0.00	0.66	0.00	0.66	0.00	0.61	0.00	0.69	0.00	0.66	0.00	0.66	0.00	0.63	0.00	0.56	0.00	0.66	0.00	0.68	0.00	0.72	0.00	0.81
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	66.52	0.00	5.52	0.00	22.91	0.00	3.45	0.00	1.59	0.00	3.65	0.00	7.63	0.00	45.08	0.00	23.15	0.00	13.32	0.00	3.03	0.00	55.66	0.00	19.45
upstream pond	ac-ft/yr	0.00	125.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1104.84	0.00	26.04	0.00	0.00	0.00	239.04	0.00	0.00	0.00	55.66
total inflow	**ac-ft/yr**	**0.00**	**192.25**	**0.00**	**5.52**	**0.00**	**22.91**	**0.00**	**3.45**	**0.00**	**1.59**	**0.00**	**3.65**	**0.00**	**7.63**	**0.00**	**1149.92**	**0.00**	**49.19**	**0.00**	**13.32**	**0.00**	**242.07**	**0.00**	**55.66**	**0.00**	**75.12**
outflow	ac-ft/yr	0.00	192.25	0.00	5.52	0.00	22.91	0.00	3.45	0.00	1.59	0.00	3.65	0.00	7.63	0.00	1149.92	0.00	49.19	0.00	13.32	0.00	242.07	0.00	55.66	0.00	75.12
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	70.33	0.00	5.87	0.00	24.38	0.00	3.63	0.00	1.70	0.00	3.88	0.00	8.12	0.00	47.30	0.00	23.72	0.00	14.17	0.00	3.23	0.00	57.04	0.00	20.48
upstream pond	lbs/yr	0.00	73.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	512.98	0.00	10.25	0.00	0.00	0.00	112.02	0.00	0.00	0.00	33.95
total inflow	**lbs/yr**	**0.00**	**143.94**	**0.00**	**5.87**	**0.00**	**24.38**	**0.00**	**3.63**	**0.00**	**1.70**	**0.00**	**3.88**	**0.00**	**8.12**	**0.00**	**560.28**	**0.00**	**33.96**	**0.00**	**14.17**	**0.00**	**115.25**	**0.00**	**57.04**	**0.00**	**54.43**
net sedimentation	lbs/yr	0.00	65.50	0.00	2.87	0.00	11.61	0.00	0.93	0.00	0.74	0.00	2.27	0.00	5.05	0.00	0.00	0.00	2.93	0.00	0.00	0.00	25.37	0.00	23.09	0.00	2.85
outflow	lbs/yr	0.00	78.43	0.00	3.00	0.00	12.77	0.00	2.70	0.00	0.96	0.00	1.61	0.00	3.07	0.00	560.28	0.00	31.03	0.00	14.17	0.00	89.88	0.00	33.95	0.00	51.58
p removal efficiency	%	100.00	45.51	100.00	48.91	100.00	47.63	100.00	25.69	100.00	43.65	100.00	58.46	100.00	62.16	100.00	0.00	100.00	8.63	100.00	0.01	100.00	22.01	100.00	40.48	100.00	5.24
upstream w-shed p load	lbs/yr	0.00	198.47	0.00	5.87	0.00	24.38	0.00	3.63	0.00	1.70	0.00	3.88	0.00	8.12	0.00	1201.51	0.00	52.16	0.00	14.17	0.00	251.45	0.00	57.04	0.00	77.52
total removal %	%	100.00	60.48	100.00	48.91	100.00	47.63	100.00	25.69	100.00	43.65	100.00	58.46	100.00	62.16	100.00	53.37	100.00	40.50	100.00	0.01	100.00	64.25	100.00	40.48	100.00	33.47
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	4.18	1.00	1.35	1.00	1.68	1.00	0.49	1.00	0.91	1.00	2.16	1.00	2.83	1.00	0.00	1.00	0.64	1.00	0.10	1.00	1.82	1.00	2.11	1.00	0.58
relative volume	inches	0.00	4.85	0.00	5.17	0.00	2.15	0.00	0.65	0.00	6.55	0.00	25.56	0.00	24.27	0.00	0.00	0.00	0.19	0.00	0.00	0.00	41.71	0.00	0.85	0.00	0.17
residence time	years	87585.71	0.05	87585.71	0.15	87585.71	0.06	87585.71	0.02	87585.71	0.19	87585.71	0.74	87585.71	0.70	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.02	87585.71	0.02	87585.71	0.00
residence time	days	31968784.45	17.69	31968784.45	54.50	31968784.45	22.71	31968784.45	6.84	31968784.45	69.07	31968784.45	269.48	31968784.45	255.86	31968784.45	0.00	31968784.45	0.93	31968784.45	0.00	31968784.45	5.50	31968784.45	8.92	31968784.45	0.47
overflow rate	ft/yr	0.00	86.21	0.00	9.04	0.00	26.96	0.00	26.33	0.00	4.79	0.00	2.92	0.00	4.04	0.00	17.16	0.00	250.97	0.00	133227.13	0.00	120.43	0.00	86.44	0.00	449.82
inflow phos conc	ppb	366.44	275.45	366.44	391.52	366.44	391.52	366.44	386.97	366.44	393.18	366.44	391.52	366.44	391.59	366.44	179.26	366.44	254.03	366.44	391.26	366.44	175.17	366.44	377.03	366.44	266.59
outflow phos conc	ppb	366.44	150.10	366.44	200.04	366.44	205.03	366.44	287.54	366.44	221.57	366.44	162.63	366.44	148.19	366.44	179.26	366.44	232.10	366.44	391.24	366.44	136.61	366.44	224.40	366.44	252.63
p reaction rate	-	1.57	1.53	1.57	1.87	1.57	1.74	1.57	0.47	1.57	1.37	1.57	3.39	1.57	4.34	1.57	0.00	1.57	0.10	1.57	0.00	1.57	0.36	1.57	1.14	1.57	0.06
1-rp	-	1.00	0.54	1.00	0.51	1.00	0.52	1.00	0.74	1.00	0.56	1.00	0.42	1.00	0.38	1.00	1.00	1.00	0.91	1.00	1.00	1.00	0.78	1.00	0.60	1.00	0.95
vlawmo pond volume	acre-ft	0.00	4.80	0.00	0.40	0.00	1.65	0.00	0.25	0.00	0.11	0.00	0.26	0.00	0.55	0.00	3.26	0.00	1.67	0.00	0.96	0.00	0.22	0.00	4.02	0.00	1.40
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	377.06	0.00	391.50	0.00	391.50	0.00	373.35	0.00	392.85	0.00	391.50	0.00	391.56	0.00	377.94	0.00	361.91	0.00	389.70	0.00	392.33	0.00	377.66	0.00	388.45
runoff coefficient		0.00	0.21	0.00	0.22	0.00	0.22	0.00	0.20	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.21	0.00	0.19	0.00	0.21	0.00	0.22	0.00	0.24	0.00	0.27
dissolved/total P		0.00	0.32	0.00	0.30	0.00	0.30	0.00	0.33	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	146.08	0.00	140.00	0.00	140.00	0.00	147.20	0.00	140.00	0.00	140.00	0.00	140.00	0.00	147.66	0.00	155.92	0.00	140.77	0.00	140.00	0.00	142.57	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	25499.65	0.00	2092.65	0.00	8692.79	0.00	1325.51	0.00	603.56	0.00	1385.04	0.00	2894.70	0.00	17526.01	0.00	9273.65	0.00	5061.15	0.00	1149.42	0.00	21268.17	0.00	7381.10
upstream pond	lbs/yr	0.00	12343.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84344.40	0.00	612.03	0.00	0.00	0.00	16874.44	0.00	0.00	0.00	6805.81
total inflow	**lbs/yr**	**0.00**	**37842.89**	**0.00**	**2092.65**	**0.00**	**8692.79**	**0.00**	**1325.51**	**0.00**	**603.56**	**0.00**	**1385.04**	**0.00**	**2894.70**	**0.00**	**101870.42**	**0.00**	**9885.68**	**0.00**	**5061.15**	**0.00**	**18023.86**	**0.00**	**21268.17**	**0.00**	**14186.91**
p removal efficiency (no inf)	%	0.00	48.00	0.00	52.00	0.00	50.00	0.00	28.00	0.00	46.00	0.00	61.00	0.00	65.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	24.00	0.00	42.00	0.00	6.00
tss removal efficiency (no inf)	%	0.00	76.00	0.00	85.00	0.00	81.00	0.00	55.00	0.00	72.00	0.00	93.00	0.00	93.00	0.00	0.00	0.00	19.64	0.00	0.00	0.00	47.14	0.00	68.00	0.00	11.79
net sedimentation	lbs/yr	0.00	28760.60	0.00	1778.75	0.00	7041.16	0.00	729.03	0.00	434.56	0.00	1288.09	0.00	2692.07	0.00	0.00	0.00	1941.83	0.00	0.00	0.00	8496.96	0.00	14462.35	0.00	1672.03
outflow	lbs/yr	0.00	9082.29	0.00	313.90	0.00	1651.63	0.00	596.48	0.00	169.00	0.00	96.95	0.00	202.63	0.00	101870.42	0.00	7943.85	0.00	5061.15	0.00	9526.90	0.00	6805.81	0.00	12514.88
tss removal efficiency (inf)	%	100.00	76.00	100.00	85.00	100.00	81.00	100.00	55.00	100.00	72.00	100.00	93.00	100.00	93.00	100.00	0.00	100.00	19.64	100.00	0.00	100.00	47.14	100.00	68.00	100.00	11.79
upstream watershed tss load	lbs/yr	0.00	74110.96	0.00	2092.65	0.00	8692.79	0.00	1325.51	0.00	603.56	0.00	1385.04	0.00	2894.70	0.00	446794.09	0.00	19480.69	0.00	5061.15	0.00	93036.03	0.00	21268.17	0.00	28649.27
tss total removal efficiency	%	100.00	87.75	100.00	85.00	100.00	81.00	100.00	55.00	100.00	72.00	100.00	93.00	100.00	93.00	100.00	77.20	100.00	59.22	100.00	0.00	100.00	89.76	100.00	68.00	100.00	56.32
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**192.25**	**0.00**	**5.52**	**0.00**	**22.91**	**0.00**	**3.45**	**0.00**	**1.59**	**0.00**	**3.65**	**0.00**	**7.63**	**0.00**	**1149.92**	**0.00**	**49.19**	**0.00**	**13.32**	**0.00**	**242.07**	**0.00**	**55.66**	**0.00**	**75.12**
Adjusted TP outflow	**lbs/yr**	**0.00**	**78.43**	**0.00**	**3.00**	**0.00**	**12.77**	**0.00**	**2.70**	**0.00**	**0.96**	**0.00**	**1.61**	**0.00**	**3.07**	**0.00**	**560.28**	**0.00**	**31.03**	**0.00**	**14.17**	**0.00**	**89.88**	**0.00**	**33.95**	**0.00**	**51.58**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**9082.29**	**0.00**	**313.90**	**0.00**	**1651.63**	**0.00**	**596.48**	**0.00**	**169.00**	**0.00**	**96.95**	**0.00**	**202.63**	**0.00**	**101870.42**	**0.00**	**7943.85**	**0.00**	**5061.15**	**0.00**	**9526.90**	**0.00**	**6805.81**	**0.00**	**12514.88**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	79.27	0.00	6.75	0.00	28.03	0.00	4.16	0.00	1.90	0.00	4.47	0.00	9.32	0.00	53.36	0.00	26.98	0.00	16.23	0.00	3.66	0.00	62.27	0.00	22.51
Adjusted TP outflow	**lbs/yr**	**0.00**	**83.89**	**0.00**	**3.29**	**0.00**	**14.02**	**0.00**	**3.00**	**0.00**	**1.04**	**0.00**	**1.76**	**0.00**	**3.34**	**0.00**	**606.16**	**0.00**	**34.44**	**0.00**	**16.23**	**0.00**	**96.11**	**0.00**	**36.13**	**0.00**	**55.35**
upstream pond	lbs/yr	0.00	79.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	552.80	0.00	11.07	0.00	0.00	0.00	121.47	0.00	0.00	0.00	36.13
total inflow	**lbs/yr**	**0.00**	**158.81**	**0.00**	**6.75**	**0.00**	**28.03**	**0.00**	**4.16**	**0.00**	**1.90**	**0.00**	**4.47**	**0.00**	**9.32**	**0.00**	**606.16**	**0.00**	**38.05**	**0.00**	**16.23**	**0.00**	**125.12**	**0.00**	**62.27**	**0.00**	**58.63**
outflow	lbs/yr	0.00	83.89	0.00	3.29	0.00	14.02	0.00	3.00	0.00	1.04	0.00	1.76	0.00	3.34	0.00	606.16	0.00	34.44	0.00	16.23	0.00	96.11	0.00	36.13	0.00	55.35
inflow phos conc	ppb	381.54	303.92	381.54	450.02	381.54	450.02	381.54	444.08	381.54	440.24	381.54	450.00	381.54	449.61	381.54	193.94	381.54	284.61	381.54	448.30	381.54	190.17	381.54	411.57	381.54	287.18
outflow phos conc	ppb	381.54	160.53	381.54	219.49	381.54	225.14	381.54	320.53	381.54	239.58	381.54	177.46	381.54	161.29	381.54	193.94	381.54	257.60	381.54	448.27	381.54	146.08	381.54	238.77	381.54	271.10
p reaction rate	-	1.63	1.69	1.63	2.15	1.63	2.00	1.63	0.53	1.63	1.54	1.63	3.89	1.63	4.98	1.63	0.00	1.63	0.12	1.63	0.00	1.63	0.39	1.63	1.25	1.63	0.06
1-rp	-	1.00	0.53	1.00	0.49	1.00	0.50	1.00	0.72	1.00	0.54	1.00	0.39	1.00	0.36	1.00	1.00	1.00	0.91	1.00	1.00	1.00	0.77	1.00	0.58	1.00	0.94
runoff total p calc	ppb	0.00	424.91	0.00	450.00	0.00	450.00	0.00	426.31	0.00	442.03	0.00	449.98	0.00	449.67	0.00	425.71	0.00	407.77	0.00	446.58	0.00	445.08	0.00	416.66	0.00	428.95

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

Cobblestone Lake

		Future EVR-38	EVR-38	Future EVR-39	EVR-39	Future EVR-40	EVR-40	Future EVR-400	EVR-400	Future EVR-41	EVR-41	Future EVR-42	EVR-42	Future EVR-43	EVR-43	Future EVR-430	EVR-430	Future EVR-44	EVR-44	Future EVR-440	EVR-440	Future EVR-45	EVR-45	Future EVR-46	EVR-46	Future EVR-47	EVR-47
		EVR-38	EVR-39	EVR-39	EVR-40	EVR-40	EVR-43	EVR-400	EVR-40	EVR-41	EVR-44	EVR-42	EVR-44	EVR-43	EVR-44	EVR-430	EVR-43	EVR-44	Lakeville	EVR-440	EVR-44	EVR-45	EVR-46	EVR-46	EVR-47	EVR-47	Rosemount
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	14.3	0.00	221.3	0.00	116.9	0.00	8.9	2.42	66.4	131.82	37.5	0.17	89.6	0.00	13.2	180.52	153.9	1.37	18.5	0.00	37.6	0.00	9.0	0.00	8.5
Total watershed area (w/o wat	acres	0.00	13.8	0.00	217.7	0.00	113.4	0.00	8.9	2.42	63.0	131.82	37.5	0.17	89.1	0.00	13.2	180.52	120.3	1.37	18.5	0.00	36.1	0.00	7.5	0.00	6.6
basin area	acres	0.00	0.46	0.00	3.53	0.00	3.50	0.00	0.00	0.00	3.41	0.00	0.00	0.00	0.52	0.00	0.00	0.00	33.60	0.00	0.00	0.00	1.42	0.00	1.50	0.00	1.92
basin volume	acre-ft	0.00	0.51	0.00	3.07	0.00	10.51	0.00	0.00	0.00	25.67	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	3.63	0.00	5.49
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	0%	0%	69%	0%	87%	0%	47%	0%	87%	28%	61%	0%	88%	0%	52%	19%	65%	0%	1%	0%	99%	0%	94%	0%	88%
Medium Density Residential		0%	100%	0%	8%	0%	0%	0%	0%	100%	0%	62%	0%	100%	0%	0%	0%	44%	13%	69%	30%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	7%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	7%	0%	0%	0%	0%	0%	12%	1%	0%	0%	0%	0%	0%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	41%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	10%	0%	0%	12%	0%	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	4%	0%	11%	0%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%	32%	0%	0%	0%	48%	0%	13%	0%	28%	0%	1%	0%	6%	0%	12%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	13.84	0.00	2246.70	0.00	2369.02	0.00	8.89	2.42	65.46	131.82	169.32	0.17	2471.52	0.00	13.23	180.52	3184.23	1.37	19.91	0.00	36.18	0.00	43.70	0.00	50.30
tributary water area	ac	0.00	0.46	0.00	167.78	0.00	171.28	0.00	0.00	0.00	3.41	0.00	0.00	0.00	171.80	0.00	0.00	0.00	211.79	0.00	0.00	0.00	1.42	0.00	2.91	0.00	4.84
direct and ponded area	ac	0.00	14.29	0.00	2414.48	0.00	2540.30	0.00	8.89	2.42	68.87	131.82	169.32	0.17	2643.33	0.00	13.23	180.52	3396.02	1.37	19.91	0.00	37.60	0.00	46.61	0.00	55.14
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.50	0.00	373.00	0.00	370.74	0.00	289.82	391.50	386.75	377.12	391.13	391.50	373.84	0.00	395.42	375.39	388.62	378.72	377.00	0.00	391.57	0.00	391.97	0.00	392.51
runoff ortho p/total p	-	0.30	0.30	0.30	0.31	0.30	0.33	0.30	0.46	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	10.60	0.00	8.21	0.00	6.87	0.00	4.42	10.60	8.33	9.03	8.42	10.60	6.92	0.00	8.46	11.14	8.51	11.89	10.70	0.00	7.46	0.00	7.56	0.00	7.70
unit export	lbs/ac-y	0.00	0.94	0.00	0.71	0.00	0.60	0.00	0.35	0.94	0.72	0.79	0.74	0.94	0.60	0.00	0.76	0.95	0.75	1.01	0.91	0.00	0.66	0.00	0.67	0.00	0.68
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	12.22	0.00	148.99	0.00	64.91	0.00	3.28	2.14	43.75	99.20	26.32	0.15	51.40	0.00	9.32	167.54	85.28	1.36	16.53	0.00	22.48	0.00	4.74	0.00	4.23
upstream pond	ac-ft/yr	0.00	0.00	0.00	1237.26	0.00	1389.52	0.00	0.00	0.00	0.97	0.00	52.78	0.00	1463.75	0.00	0.00	0.00	1844.55	0.00	0.43	0.00	0.02	0.00	22.51	0.00	27.24
total inflow	**ac-ft/yr**	**0.00**	**12.22**	**0.00**	**1386.25**	**0.00**	**1454.43**	**0.00**	**3.28**	**2.14**	**44.72**	**99.20**	**79.09**	**0.15**	**1515.15**	**0.00**	**9.32**	**167.54**	**1929.83**	**1.36**	**16.96**	**0.00**	**22.51**	**0.00**	**27.24**	**0.00**	**31.48**
outflow	ac-ft/yr	0.00	12.22	0.00	1386.25	0.00	1454.43	0.00	3.28	0.97	44.72	52.78	79.09	0.00	1515.15	0.00	9.32	15.39	1929.83	0.43	16.96	0.00	22.51	0.00	27.24	0.00	31.48
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	13.01	0.00	154.41	0.00	68.15	0.00	3.13	2.28	45.55	104.06	27.92	0.16	53.54	0.00	10.04	170.75	90.68	1.39	16.86	0.00	23.93	0.00	5.05	0.00	4.52
upstream pond	lbs/yr	0.00	0.00	0.00	619.57	0.00	727.42	0.00	0.00	0.00	1.42	0.00	76.75	0.00	680.32	0.00	0.00	0.00	994.68	0.00	0.49	0.00	0.02	0.00	10.55	0.00	8.48
total inflow	**lbs/yr**	**0.00**	**13.01**	**0.00**	**773.98**	**0.00**	**795.57**	**0.00**	**3.13**	**2.28**	**46.97**	**104.06**	**104.67**	**0.16**	**733.86**	**0.00**	**10.04**	**170.75**	**1085.37**	**1.39**	**17.36**	**0.00**	**23.96**	**0.00**	**15.60**	**0.00**	**13.00**
net sedimentation	lbs/yr	0.00	5.29	0.00	49.69	0.00	125.29	0.00	0.00	0.86	34.04	27.31	0.00	0.16	9.74	0.00	0.00	148.23	0.00	0.90	0.00	0.00	13.40	0.00	7.12	0.00	5.64
outflow	lbs/yr	0.00	7.71	0.00	724.29	0.00	670.28	0.00	3.13	1.42	12.93	76.75	104.67	0.00	724.12	0.00	10.04	22.52	1085.37	0.49	17.36	0.00	10.55	0.00	8.48	0.00	7.36
p removal efficiency	%	100.00	40.71	100.00	6.42	100.00	15.75	100.00	0.01	37.78	72.48	26.25	0.00	100.00	1.33	100.00	0.01	86.81	0.00	64.45	0.00	100.00	55.95	100.00	45.63	100.00	43.37
upstream w-shed p load	lbs/yr	0.00	13.01	0.00	1446.44	0.00	1517.72	0.00	3.13	2.28	47.83	104.06	131.98	0.16	1581.46	0.00	10.04	170.75	2242.93	1.39	18.25	0.00	23.96	0.00	29.01	0.00	33.53
total removal %	%	100.00	40.71	100.00	49.93	100.00	55.84	100.00	0.01	37.78	72.97	26.25	20.70	100.00	54.21	100.00	0.01	86.81	51.61	64.45	4.91	100.00	55.95	100.00	70.75	100.00	78.03
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.12	1.00	0.87	1.00	3.00	1.00	0.10	1.00	7.53	1.00	0.10	1.00	1.21	1.00	0.10	1.00	0.00	1.00	0.10	1.00	2.35	1.00	2.43	1.00	2.86
relative volume	inches	0.00	1.44	0.00	0.71	0.00	5.61	0.00	0.00	0.00	20.31	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.13	0.00	26.51	0.00	44.93
residence time	years	87585.71	0.04	87585.71	0.00	87585.71	0.01	87585.71	0.00	0.00	0.57	0.00	0.00	0.10	0.00	87585.71	0.00	0.00	0.00	0.00	0.00	87585.71	0.15	87585.71	0.13	87585.71	0.17
residence time	days	31968784.45	15.20	31968784.45	0.81	31968784.45	2.64	31968784.45	0.00	0.00	209.50	0.00	0.00	36.50	0.15	31968784.45	0.00	0.00	0.00	0.00	0.00	31968784.45	53.98	31968784.45	48.62	31968784.45	63.71
overflow rate	ft/yr	0.00	26.80	0.00	392.70	0.00	415.08	0.00	32753.92	969473.67	13.12	52776187.13	790932.31	10.00	2919.37	0.00	93231.35	15386166.60	57.44	427921.56	169621.40	0.00	15.86	0.00	18.22	0.00	16.39
inflow phos conc	ppb	366.44	391.52	366.44	205.42	366.44	201.25	366.44	351.56	391.52	386.37	385.93	486.88	391.52	178.20	366.44	396.12	374.96	206.92	375.61	376.51	366.44	391.60	366.44	210.71	366.44	151.98
outflow phos conc	ppb	366.44	232.13	366.44	192.23	366.44	169.56	366.44	351.52	391.52	106.34	385.93	486.88	391.52	175.83	366.44	396.09	374.96	206.92	375.61	376.50	366.44	172.52	366.44	114.56	366.44	86.07
p reaction rate	-	1.57	1.16	1.57	0.07	1.57	0.22	1.57	0.00	0.00	9.57	0.00	0.00	1.36	0.01	1.57	0.00	0.00	0.00	0.00	0.00	1.57	2.88	1.57	1.54	1.57	1.35
1-rp	-	1.00	0.59	1.00	0.94	1.00	0.84	1.00	1.00	1.00	0.28	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.44	1.00	0.54	1.00	0.57
vlawmo pond volume	acre-ft	0.00	0.88	0.00	10.76	0.00	4.69	0.00	0.24	0.15	3.16	7.16	1.90	0.01	3.71	0.00	0.67	12.10	6.16	0.10	1.19	0.00	1.62	0.00	0.34	0.00	0.31
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.50	0.00	373.00	0.00	370.74	0.00	289.82	391.50	386.75	377.12	391.13	391.50	373.84	0.00	395.42	375.39	388.62	378.72	377.00	0.00	391.57	0.00	391.97	0.00	392.51
runoff coefficient		0.00	0.31	0.00	0.24	0.00	0.20	0.00	0.13	0.31	0.24	0.26	0.24	0.31	0.20	0.00	0.24	0.32	0.25	0.34	0.31	0.00	0.22	0.00	0.22	0.00	0.22
dissolved/total P		0.00	0.30	0.00	0.31	0.00	0.33	0.00	0.46	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.30	0.30	0.30	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	140.00	0.00	147.05	0.00	148.30	0.00	180.33	140.00	140.00	147.55	140.00	140.00	149.48	0.00	140.07	142.51	142.12	140.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	4636.85	0.00	57410.48	0.00	24998.89	0.00	1382.92	812.29	16599.95	38365.93	9984.69	57.30	20120.88	0.00	3537.59	63896.89	32542.78	516.30	6273.09	0.00	8530.15	0.00	1797.73	0.00	1606.21
upstream pond	lbs/yr	0.00	0.00	0.00	115807.27	0.00	150783.22	0.00	0.00	0.00	427.94	0.00	23448.37	0.00	120621.03	0.00	0.00	0.00	206412.04	0.00	225.95	0.00	8.24	0.00	597.69	0.00	574.90
total inflow	**lbs/yr**	**0.00**	**4636.85**	**0.00**	**173217.75**	**0.00**	**175782.11**	**0.00**	**1382.92**	**812.29**	**17027.89**	**38365.93**	**33433.06**	**57.30**	**140741.91**	**0.00**	**3537.59**	**63896.89**	**238954.82**	**516.30**	**6499.04**	**0.00**	**8538.39**	**0.00**	**2395.42**	**0.00**	**2181.12**
p removal efficiency (no inf)	%	0.00	44.00	0.00	7.00	0.00	17.00	0.00	0.00	0.00	74.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.00	0.00	48.00	0.00	45.00
tss removal efficiency (no inf)	%	0.00	69.33	0.00	13.75	0.00	33.39	0.00	0.00	0.00	93.00	0.00	0.00	0.00	3.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.00	0.00	76.00	0.00	70.00
net sedimentation	lbs/yr	0.00	3214.89	0.00	23817.44	0.00	58698.67	0.00	0.00	0.00	15835.93	0.00	0.00	0.00	5529.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7940.70	0.00	1820.52	0.00	1526.78
outflow	lbs/yr	0.00	1421.97	0.00	149400.31	0.00	117083.44	0.00	1382.92	427.94	1191.95	23448.37	33433.06	0.00	135212.76	0.00	3537.59	6796.53	238954.82	225.95	6499.04	0.00	597.69	0.00	574.90	0.00	654.33
tss removal efficiency (inf)	%	100.00	69.33	100.00	13.75	100.00	33.39	100.00	0.00	47.32	93.00	38.88	0.00	100.00	3.93	100.00	0.00	89.36	0.00	56.24	0.00	100.00	93.00	100.00	76.00	100.00	70.00
upstream watershed tss load	lbs/yr	0.00	4636.85	0.00	537490.68	0.00	563872.49	0.00	1382.92	812.29	17412.24	38365.93	48350.61	57.30	587588.26	0.00	3537.59	63896.89	835404.19	516.30	6789.39	0.00	8538.90	0.00	10336.64	0.00	11942.85
tss total removal efficiency	%	100.00	69.33	100.00	72.20	100.00	79.24	100.00	0.00	47.32	93.15	38.88	30.85	100.00	76.99	100.00	0.00	89.36	71.40	56.24	4.28	100.00	93.00	100.00	94.44	100.00	94.52
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**12.22**	**0.00**	**1386.25**	**0.00**	**1454.43**	**0.00**	**3.28**	**0.97**	**44.72**	**52.78**	**79.09**	**0.00**	**1515.15**	**0.00**	**9.32**	**15.39**	**1929.83**	**0.43**	**16.96**	**0.00**	**22.51**	**0.00**	**27.24**	**0.00**	**31.48**
Adjusted TP outflow	**lbs/yr**	**0.00**	**7.71**	**0.00**	**724.29**	**0.00**	**670.28**	**0.00**	**3.13**	**1.42**	**12.93**	**76.75**	**104.67**	**0.00**	**724.12**	**0.00**	**10.04**	**22.52**	**1085.37**	**0.49**	**17.36**	**0.00**	**10.55**	**0.00**	**8.48**	**0.00**	**7.36**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**1421.97**	**0.00**	**149400.31**	**0.00**	**117083.44**	**0.00**	**1382.92**	**427.94**	**1191.95**	**23448.37**	**33433.06**	**0.00**	**135212.76**	**0.00**	**3537.59**	**6796.53**	**238954.82**	**225.95**	**6499.04**	**0.00**	**597.69**	**0.00**	**574.90**	**0.00**	**654.33**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	14.95	0.00	174.13	0.00	77.92	0.00	3.54	2.62	50.97	119.07	30.18	0.18	61.24	0.00	10.71	187.38	102.18	1.52	17.67	0.00	27.47	0.00	5.75	0.00	5.09
Adjusted TP outflow	**lbs/yr**	**0.00**	**8.51**	**0.00**	**785.68**	**0.00**	**721.84**	**0.00**	**3.54**	**2.62**	**13.95**	**119.07**	**149.24**	**0.18**	**782.59**	**0.00**	**10.71**	**187.38**	**1382.23**	**1.52**	**19.19**	**0.00**	**11.52**	**0.00**	**9.09**	**0.00**	**7.82**
upstream pond	lbs/yr	0.00	0.00	0.00	670.02	0.00	789.22	0.00	0.00	0.00	2.62	0.00	119.07	0.00	732.73	0.00	0.00	0.00	1280.06	0.00	1.52	0.00	0.03	0.00	11.52	0.00	9.09
total inflow	**lbs/yr**	**0.00**	**14.95**	**0.00**	**844.14**	**0.00**	**867.14**	**0.00**	**3.54**	**2.62**	**53.59**	**119.07**	**149.24**	**0.18**	**793.97**	**0.00**	**10.71**	**187.38**	**1382.23**	**1.52**	**19.19**	**0.00**	**27.50**	**0.00**	**17.27**	**0.00**	**14.19**
outflow	lbs/yr	0.00	8.51	0.00	785.68	0.00	721.84	0.00	3.54	2.62	13.95	119.07	149.24	0.18	782.59	0.00	10.71	187.38	1382.23	1.52	19.19	0.00	11.52	0.00	9.09	0.00	7.82
inflow phos conc	ppb	381.54	450.02	381.54	224.04	381.54	219.35	381.54	397.70	450.02	440.88	441.59	694.23	450.02	192.80	381.54	422.67	411.48	263.52	411.68	416.25	381.54	449.48	381.54	233.25	381.54	165.81
outflow phos conc	ppb	381.54	256.07	381.54	208.52	381.54	182.60	381.54	397.64	450.02	114.75	441.59	694.22	450.02	190.03	381.54	422.63	411.48	263.52	411.68	416.23	381.54	188.34	381.54	122.79	381.54	91.43
p reaction rate	-	1.63	1.33	1.63	0.08	1.63	0.24	1.63	0.00	0.00	10.92	0.00	0.00	1.57	0.01	1.63	0.00	0.00	0.00	0.00	0.00	1.63	3.31	1.63	1.71	1.63	1.48
1-rp	-	1.00	0.57	1.00	0.93	1.00	0.83	1.00	1.00	1.00	0.26	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.42	1.00	0.53	1.00	0.55
runoff total p calc	ppb	0.00	450.00	0.00	421.42	0.00	421.80	0.00	317.19	450.00	437.76	429.34	426.80	450.00	425.04	0.00	425.57	415.83	438.10	419.19	395.20	0.00	449.58	0.00	447.23	0.00	444.07

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future EVR-48	EVR-48	Future EVR-49	EVR-49	Future EVR-50	EVR-50	Future EVR-51	EVR-51	Future EVR-52	EVR-52	Future EVR-53	EVR-53	Future EVR-54	EVR-54	Future EVR-55	EVR-55	Future EVR-550	EVR-550	Future EVR-551	EVR-551	Future EVR-552	EVR-552	Future EVR-553	EVR-553	Future EVR-56	EVR-56
		EVR-48	EVR-44	EVR-49	EVR-22	EVR-50	EVR-51	EVR-51	EVR-55	EVR-52	EVR-53	EVR-53	EVR-55	EVR-54	EVR-55	EVR-55	EVR-13	EVR-550	EVR-LL	EVR-551	EVR-LL	EVR-552	EVR-LL	EVR-553	EVR-LL	EVR-56	EVR-45
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		30.97	129.2	0.00	0.8	0.00	39.9	0.00	22.8	0.00	6.6	0.00	14.5	0.00	17.0	0.00	39.7	0.00	2.4	0.00	3.1	0.00	2.0	0.00	4.8	0.00	0.0
Total watershed area (w/o wat	acres	30.97	126.2	0.00	0.8	0.00	37.5	0.00	22.4	0.00	5.8	0.00	12.6	0.00	16.9	0.00	36.1	0.00	2.1	0.00	3.1	0.00	1.9	0.00	4.4	0.00	0.0
basin area	acres	0.00	2.97	0.00	0.00	0.00	2.43	0.00	0.40	0.00	0.80	0.00	1.94	0.00	0.17	0.00	3.59	0.00	0.36	0.00	0.00	0.00	0.11	0.00	0.41	0.00	0.00
basin volume	acre-ft	0.00	3.69	0.00	0.00	0.00	8.08	0.00	0.41	0.00	1.30	0.00	5.59	0.00	0.09	0.00	17.15	0.00	0.34	0.00	0.00	0.00	0.05	0.00	0.42	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	1%	0%	98%	0%	94%	0%	85%	0%	84%	0%	75%	0%	67%	0%	39%	0%	33%	0%	24%	0%	62%	0%	64%	0%	100%
Medium Density Residential		0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		100%	66%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	3%	0%	62%	0%	57%	0%	38%	0%	31%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	8%	0%	2%	0%	3%	0%	8%	0%	0%	0%	22%	0%	0%	0%	53%	0%	4%	0%	19%	0%	0%	0%	6%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	2%	0%	7%	0%	16%	0%	4%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	30.97	157.22	0.00	0.79	0.00	37.49	0.00	59.89	0.00	5.83	0.00	18.41	0.00	16.88	0.00	131.31	0.00	2.09	0.00	3.13	0.00	1.86	0.00	4.40	0.00	0.04
tributary water area	ac	0.00	2.97	0.00	0.00	0.00	2.43	0.00	2.83	0.00	0.80	0.00	2.75	0.00	0.17	0.00	9.33	0.00	0.36	0.00	0.00	0.00	0.11	0.00	0.41	0.00	0.00
direct and ponded area	ac	30.97	160.19	0.00	0.79	0.00	39.92	0.00	62.72	0.00	6.63	0.00	21.15	0.00	17.04	0.00	140.64	0.00	2.44	0.00	3.13	0.00	1.97	0.00	4.80	0.00	0.04
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	350.00	364.78	0.00	391.65	0.00	388.63	0.00	381.63	0.00	368.71	0.00	388.38	0.00	337.20	0.00	382.41	0.00	272.97	0.00	283.44	0.00	319.07	0.00	333.12	0.00	391.38
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.34	0.30	0.31	0.30	0.49	0.30	0.47	0.30	0.41	0.30	0.39	0.30	0.30
unit runoff	in/yr	17.95	15.34	0.00	7.48	0.00	7.45	0.00	7.37	0.00	6.94	0.00	7.79	0.00	5.83	0.00	8.21	0.00	3.99	0.00	4.58	0.00	5.29	0.00	5.81	0.00	7.45
unit export	lbs/ac-y	1.42	1.25	0.00	0.66	0.00	0.66	0.00	0.64	0.00	0.59	0.00	0.69	0.00	0.49	0.00	0.73	0.00	0.31	0.00	0.37	0.00	0.44	0.00	0.49	0.00	0.66
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	46.34	161.42	0.00	0.49	0.00	23.27	0.00	13.76	0.00	3.37	0.00	8.17	0.00	8.20	0.00	24.73	0.00	0.69	0.00	1.19	0.00	0.82	0.00	2.13	0.00	0.02
upstream pond	ac-ft/yr	0.00	11.81	0.00	0.00	0.00	0.00	0.00	23.27	0.00	0.00	0.00	3.37	0.00	0.00	0.00	56.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**46.34**	**173.23**	**0.00**	**0.49**	**0.00**	**23.27**	**0.00**	**37.03**	**0.00**	**3.37**	**0.00**	**11.54**	**0.00**	**8.20**	**0.00**	**81.50**	**0.00**	**0.69**	**0.00**	**1.19**	**0.00**	**0.82**	**0.00**	**2.13**	**0.00**	**0.02**
outflow	ac-ft/yr	11.81	173.23	0.00	0.49	0.00	23.27	0.00	37.03	0.00	3.37	0.00	11.54	0.00	8.20	0.00	81.50	0.00	0.69	0.00	1.19	0.00	0.82	0.00	2.13	0.00	0.02
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	44.08	157.90	0.00	0.52	0.00	24.67	0.00	14.44	0.00	3.46	0.00	8.68	0.00	8.21	0.00	26.32	0.00	0.64	0.00	1.15	0.00	0.82	0.00	2.17	0.00	0.02
upstream pond	lbs/yr	0.00	16.97	0.00	0.00	0.00	0.00	0.00	9.16	0.00	0.00	0.00	1.63	0.00	0.00	0.00	29.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**44.08**	**174.87**	**0.00**	**0.52**	**0.00**	**24.67**	**0.00**	**23.61**	**0.00**	**3.46**	**0.00**	**10.31**	**0.00**	**8.21**	**0.00**	**55.61**	**0.00**	**0.64**	**0.00**	**1.15**	**0.00**	**0.82**	**0.00**	**2.17**	**0.00**	**0.02**
net sedimentation	lbs/yr	27.12	61.77	0.00	0.00	0.00	15.51	0.00	4.89	0.00	1.83	0.00	6.11	0.00	1.83	0.00	32.21	0.00	0.22	0.00	0.00	0.00	0.20	0.00	0.87	0.00	0.00
outflow	lbs/yr	16.97	113.10	0.00	0.52	0.00	9.16	0.00	18.72	0.00	1.63	0.00	4.20	0.00	6.38	0.00	23.40	0.00	0.42	0.00	1.15	0.00	0.62	0.00	1.29	0.00	0.02
p removal efficiency	%	61.51	35.32	100.00	0.15	100.00	62.87	100.00	20.70	100.00	52.87	100.00	59.24	100.00	22.32	100.00	57.92	100.00	34.74	100.00	0.03	100.00	24.48	100.00	40.33	100.00	2.53
upstream w-shed p load	lbs/yr	44.08	201.98	0.00	0.52	0.00	24.67	0.00	39.11	0.00	3.46	0.00	12.14	0.00	8.21	0.00	85.78	0.00	0.64	0.00	1.15	0.00	0.82	0.00	2.17	0.00	0.02
total removal %	%	61.51	44.01	100.00	0.15	100.00	62.87	100.00	52.15	100.00	52.87	100.00	65.38	100.00	22.32	100.00	72.72	100.00	34.74	100.00	0.03	100.00	24.48	100.00	40.33	100.00	2.53
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.24	1.00	0.10	1.00	3.33	1.00	1.02	1.00	1.62	1.00	2.88	1.00	0.57	1.00	4.77	1.00	0.95	1.00	0.10	1.00	0.44	1.00	1.03	1.00	0.10
relative volume	inches	0.00	0.79	0.00	0.00	0.00	12.03	0.00	1.03	0.00	13.33	0.00	23.71	0.00	0.40	0.00	24.01	0.00	16.77	0.00	0.00	0.00	2.04	0.00	6.83	0.00	0.02
residence time	years	0.00	0.02	87585.71	0.00	87585.71	0.35	87585.71	0.01	87585.71	0.39	87585.71	0.48	87585.71	0.01	87585.71	0.21	87585.71	0.48	87585.71	0.00	87585.71	0.06	87585.71	0.20	87585.71	0.00
residence time	days	0.00	7.77	31968784.45	0.01	31968784.45	126.80	31968784.45	4.04	31968784.45	140.53	31968784.45	176.96	31968784.45	4.21	31968784.45	76.82	31968784.45	176.83	31968784.45	0.00	31968784.45	21.52	31968784.45	71.98	31968784.45	0.16
overflow rate	ft/yr	11810492.12	58.27	0.00	4903.15	0.00	9.59	0.00	92.57	0.00	4.20	0.00	5.94	0.00	49.69	0.00	22.68	0.00	1.96	0.00	11936.79	0.00	7.46	0.00	5.25	0.00	230.69
inflow phos conc	ppb	350.02	371.38	366.44	391.71	366.44	390.07	366.44	234.54	366.44	377.41	366.44	328.77	366.44	368.40	366.44	251.07	366.44	340.85	366.44	353.43	366.44	367.80	366.44	374.78	366.44	391.40
outflow phos conc	ppb	350.02	240.20	366.44	391.13	366.44	144.85	366.44	185.98	366.44	177.86	366.44	133.99	366.44	286.16	366.44	105.65	366.44	222.43	366.44	353.30	366.44	277.77	366.44	223.64	366.44	381.50
p reaction rate	-	0.00	0.84	1.57	0.00	1.57	4.56	1.57	0.33	1.57	2.38	1.57	3.57	1.57	0.37	1.57	3.27	1.57	0.82	1.57	0.00	1.57	0.43	1.57	1.13	1.57	0.03
1-rp	-	1.00	0.65	1.00	1.00	1.00	0.37	1.00	0.79	1.00	0.47	1.00	0.41	1.00	0.78	1.00	0.42	1.00	0.65	1.00	1.00	1.00	0.76	1.00	0.60	1.00	0.97
vlawmo pond volume	acre-ft	3.35	11.66	0.00	0.04	0.00	1.68	0.00	0.99	0.00	0.24	0.00	0.59	0.00	0.59	0.00	1.79	0.00	0.05	0.00	0.09	0.00	0.06	0.00	0.15	0.00	0.00
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	350.00	364.78	0.00	391.65	0.00	388.63	0.00	381.63	0.00	368.71	0.00	388.38	0.00	337.20	0.00	382.41	0.00	272.97	0.00	283.44	0.00	319.07	0.00	333.12	0.00	391.38
runoff coefficient		0.52	0.44	0.00	0.22	0.00	0.22	0.00	0.21	0.00	0.20	0.00	0.23	0.00	0.17	0.00	0.24	0.00	0.12	0.00	0.13	0.00	0.15	0.00	0.17	0.00	0.22
dissolved/total P		0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.34	0.00	0.31	0.00	0.49	0.00	0.47	0.00	0.41	0.00	0.39	0.00	0.30
runoff TSS conc	ppm	140.00	140.00	0.00	140.01	0.00	141.70	0.00	145.64	0.00	152.24	0.00	142.67	0.00	165.33	0.00	146.46	0.00	187.19	0.00	183.54	0.00	168.74	0.00	163.36	0.00	140.11
POND TSS BUDGETS.....																											
runoff	lbs/yr	17579.93	61244.10	0.00	186.03	0.00	8889.97	0.00	5343.07	0.00	1348.06	0.00	3131.33	0.00	3361.39	0.00	9558.51	0.00	301.89	0.00	506.15	0.00	332.45	0.00	848.10	0.00	8.76
upstream pond	lbs/yr	0.00	5266.48	0.00	0.00	0.00	0.00	0.00	622.30	0.00	0.00	0.00	114.59	0.00	0.00	0.00	5208.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**17579.93**	**66510.58**	**0.00**	**186.03**	**0.00**	**8889.97**	**0.00**	**5965.37**	**0.00**	**1348.06**	**0.00**	**3245.92**	**0.00**	**3361.39**	**0.00**	**14766.73**	**0.00**	**301.89**	**0.00**	**506.15**	**0.00**	**332.45**	**0.00**	**848.10**	**0.00**	**8.76**
p removal efficiency (no inf)	%	0.00	39.00	0.00	0.00	0.00	65.00	0.00	23.00	0.00	55.00	0.00	61.00	0.00	25.00	0.00	59.00	0.00	37.00	0.00	0.00	0.00	27.00	0.00	43.00	0.00	3.00
tss removal efficiency (no inf)	%	0.00	65.00	0.00	0.00	0.00	93.00	0.00	45.18	0.00	91.50	0.00	93.00	0.00	49.11	0.00	93.00	0.00	63.00	0.00	0.00	0.00	53.04	0.00	68.67	0.00	5.89
net sedimentation	lbs/yr	0.00	43231.88	0.00	0.00	0.00	8267.67	0.00	2695.07	0.00	1233.48	0.00	3018.70	0.00	1650.68	0.00	13733.06	0.00	190.19	0.00	0.00	0.00	176.32	0.00	582.36	0.00	0.52
outflow	lbs/yr	5266.48	23278.70	0.00	186.03	0.00	622.30	0.00	3270.30	0.00	114.59	0.00	227.21	0.00	1710.71	0.00	1033.67	0.00	111.70	0.00	506.15	0.00	156.13	0.00	265.74	0.00	8.24
tss removal efficiency (inf)	%	70.04	65.00	100.00	0.00	100.00	93.00	100.00	45.18	100.00	91.50	100.00	93.00	100.00	49.11	100.00	93.00	100.00	63.00	100.00	0.00	100.00	53.04	100.00	68.67	100.00	5.89
upstream watershed tss load	lbs/yr	17579.93	78824.03	0.00	186.03	0.00	8889.97	0.00	14233.04	0.00	1348.06	0.00	4479.40	0.00	3361.39	0.00	31632.34	0.00	301.89	0.00	506.15	0.00	332.45	0.00	848.10	0.00	8.76
tss total removal efficiency	%	70.04	70.47	100.00	0.00	100.00	93.00	100.00	77.02	100.00	91.50	100.00	94.93	100.00	49.11	100.00	96.73	100.00	63.00	100.00	0.00	100.00	53.04	100.00	68.67	100.00	5.89
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**11.81**	**173.23**	**0.00**	**0.49**	**0.00**	**23.27**	**0.00**	**37.03**	**0.00**	**3.37**	**0.00**	**11.54**	**0.00**	**8.20**	**0.00**	**81.50**	**0.00**	**0.69**	**0.00**	**1.19**	**0.00**	**0.82**	**0.00**	**2.13**	**0.00**	**0.02**
Adjusted TP outflow	**lbs/yr**	**16.97**	**113.10**	**0.00**	**0.52**	**0.00**	**9.16**	**0.00**	**18.72**	**0.00**	**1.63**	**0.00**	**4.20**	**0.00**	**6.38**	**0.00**	**23.40**	**0.00**	**0.42**	**0.00**	**1.15**	**0.00**	**0.62**	**0.00**	**1.29**	**0.00**	**0.02**
Adjusted TSS outflow	**lbs/yr**	**5266.48**	**23278.70**	**0.00**	**186.03**	**0.00**	**622.30**	**0.00**	**3270.30**	**0.00**	**114.59**	**0.00**	**227.21**	**0.00**	**1710.71**	**0.00**	**1033.67**	**0.00**	**111.70**	**0.00**	**506.15**	**0.00**	**156.13**	**0.00**	**265.74**	**0.00**	**8.24**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	44.08	162.40	0.00	0.60	0.00	28.16	0.00	16.33	0.00	3.94	0.00	9.61	0.00	9.32	0.00	27.69	0.00	0.71	0.00	1.22	0.00	0.94	0.00	2.44	0.00	0.03
Adjusted TP outflow	**lbs/yr**	**44.08**	**127.72**	**0.00**	**0.60**	**0.00**	**9.93**	**0.00**	**20.43**	**0.00**	**1.77**	**0.00**	**4.47**	**0.00**	**7.07**	**0.00**	**24.46**	**0.00**	**0.45**	**0.00**	**1.22**	**0.00**	**0.69**	**0.00**	**1.41**	**0.00**	**0.03**
upstream pond	lbs/yr	0.00	44.08	0.00	0.00	0.00	0.00	0.00	9.93	0.00	0.00	0.00	1.77	0.00	0.00	0.00	31.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**44.08**	**206.48**	**0.00**	**0.60**	**0.00**	**28.16**	**0.00**	**26.26**	**0.00**	**3.94**	**0.00**	**11.38**	**0.00**	**9.32**	**0.00**	**59.66**	**0.00**	**0.71**	**0.00**	**1.22**	**0.00**	**0.94**	**0.00**	**2.44**	**0.00**	**0.03**
outflow	lbs/yr	44.08	127.72	0.00	0.60	0.00	9.93	0.00	20.43	0.00	1.77	0.00	4.47	0.00	7.07	0.00	24.46	0.00	0.45	0.00	1.22	0.00	0.69	0.00	1.41	0.00	0.03
inflow phos conc	ppb	350.02	438.53	381.54	448.87	381.54	445.26	381.54	260.88	381.54	430.08	381.54	362.94	381.54	418.22	381.54	269.35	381.54	377.35	381.54	375.81	381.54	419.05	381.54	422.42	381.54	449.68
outflow phos conc	ppb	350.02	271.24	381.54	448.11	381.54	157.03	381.54	203.02	381.54	193.61	381.54	142.54	381.54	317.18	381.54	110.44	381.54	239.76	381.54	375.67	381.54	308.21	381.54	243.39	381.54	436.72
p reaction rate	-	0.00	1.00	1.63	0.00	1.63	5.20	1.63	0.37	1.63	2.71	1.63	3.94	1.63	0.42	1.63	3.51	1.63	0.90	1.63	0.00	1.63	0.49	1.63	1.28	1.63	0.03
1-rp	-	1.00	0.62	1.00	1.00	1.00	0.35	1.00	0.78	1.00	0.45	1.00	0.39	1.00	0.76	1.00	0.41	1.00	0.64	1.00	1.00	1.00	0.74	1.00	0.58	1.00	0.97
runoff total p calc	ppb	350.00	379.77	0.00	449.10	0.00	443.82	0.00	431.40	0.00	417.78	0.00	432.09	0.00	376.20	0.00	404.95	0.00	292.53	0.00	297.19	0.00	355.45	0.00	370.28	0.00	449.70

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

Keller Lake | Lac Lavon Lake

		Future KL-1	KL-1	Future KL-2	KL-2	Future KL-20	KL-20	Future KL-3	KL-3	Future KL-300	KL-300	Future KL-4	KL-4	Future LL-1	LL-1	Future exit 1	exit 1	Future exit 2	exit 2	Future exit 3a	exit 3a	Future exit 3b	exit 3b	Future exit 4	exit 4	Future exit 5	exit 5
		KL-1	KL-2	KL-2	KL-20	KL-20	Burnsville	KL-3	KL-2	KL-300	KL-2	KL-4	WVR-46	LL-1	Burnsville	exit 1	Lakeville	exit 2	Burnsville	exit 3a	Burnsville	exit 3b	exit 4	exit 4	Eagan	exit 5	Eagan
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	202.3	0.00	226.1	0.00	104.8	0.05	113.4	0.00	82.0	0.00	73.7	0.00	156.1	0.00	4.2	0.00	3.6	0.00	9.0	0.00	9.4	0.00	23.1	0.00	0.7
Total watershed area (w/o wat	acres	0.00	200.7	0.00	225.5	0.00	104.8	0.05	110.9	0.00	82.0	0.00	72.2	0.00	96.3	0.00	4.2	0.00	3.6	0.00	9.0	0.00	9.4	0.00	23.1	0.00	0.7
basin area	acres	0.00	1.61	0.00	2.00	0.00	0.00	0.00	2.47	0.00	0.00	0.00	1.51	0.00	59.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
basin volume	acre-ft	0.00	7.42	1.00	10.10	0.00	0.00	0.00	8.33	0.00	0.00	0.00	4.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	77%	0%	84%	0%	72%	0%	90%	0%	61%	0%	3%	0%	88%	0%	0%	0%	0%	0%	0%	0%	56%	0%	17%	0%	100%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	21%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	10%	0%	10%	0%	23%	0%	0%	0%	4%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	8%	0%	5%	0%	4%	100%	5%	0%	5%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	4%	0%	9%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	0%	1%	0%	100%	0%	100%	0%	100%	0%	44%	0%	83%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	200.70	0.00	619.16	0.00	723.95	0.05	110.97	0.00	82.04	0.00	72.21	0.00	96.31	0.00	4.23	0.00	3.57	0.00	9.00	0.00	9.44	0.00	32.51	0.00	0.73
tributary water area	ac	0.00	1.61	0.00	6.08	0.00	6.08	0.00	2.47	0.00	0.00	0.00	1.51	0.00	59.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
direct and ponded area	ac	0.00	202.31	0.00	625.24	0.00	730.03	0.05	113.44	0.00	82.04	0.00	73.72	0.00	156.05	0.00	4.23	0.00	3.57	0.00	9.00	0.00	9.44	0.00	32.51	0.00	0.73
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	376.31	0.00	379.65	0.00	375.79	250.00	376.12	0.00	365.23	0.00	365.69	0.00	374.49	0.00	400.00	0.00	400.00	0.00	400.00	0.00	395.26	0.00	398.54	0.00	391.49
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.33	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.74	0.00	7.69	0.00	8.25	3.24	7.00	0.00	7.57	0.00	13.01	0.00	6.99	0.00	9.55	0.00	9.55	0.00	9.55	0.00	8.38	0.00	9.19	0.00	7.45
unit export	lbs/ac-y	0.00	0.67	0.00	0.67	0.00	0.70	0.18	0.61	0.00	0.65	0.00	1.06	0.00	0.61	0.00	0.87	0.00	0.87	0.00	0.87	0.00	0.75	0.00	0.83	0.00	0.66
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	129.37	0.00	144.53	0.00	72.06	0.01	64.74	0.00	51.73	0.00	78.27	0.00	56.14	0.00	3.37	0.00	2.84	0.00	7.16	0.00	6.59	0.00	17.66	0.00	0.45
upstream pond	ac-ft/yr	0.00	0.00	0.00	245.83	0.00	390.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.59	0.00	0.00
total inflow	**ac-ft/yr**	**0.00**	**129.37**	**0.00**	**390.36**	**0.00**	**462.42**	**0.01**	**64.74**	**0.00**	**51.73**	**0.00**	**78.27**	**0.00**	**56.14**	**0.00**	**3.37**	**0.00**	**2.84**	**0.00**	**7.16**	**0.00**	**6.59**	**0.00**	**24.25**	**0.00**	**0.45**
outflow	ac-ft/yr	0.00	129.37	0.00	390.36	0.00	462.42	0.00	64.74	0.00	51.73	0.00	78.27	0.00	56.14	0.00	3.37	0.00	2.84	0.00	7.16	0.00	6.59	0.00	24.25	0.00	0.45
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	133.67	0.00	149.96	0.00	73.55	0.01	67.92	0.00	53.65	0.00	76.91	0.00	58.75	0.00	3.66	0.00	3.09	0.00	7.79	0.00	7.09	0.00	19.15	0.00	0.48
upstream pond	lbs/yr	0.00	0.00	0.00	142.78	0.00	176.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.09	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**133.67**	**0.00**	**292.75**	**0.00**	**250.41**	**0.01**	**67.92**	**0.00**	**53.65**	**0.00**	**76.91**	**0.00**	**58.75**	**0.00**	**3.66**	**0.00**	**3.09**	**0.00**	**7.79**	**0.00**	**7.09**	**0.00**	**26.24**	**0.00**	**0.48**
net sedimentation	lbs/yr	0.00	72.89	0.00	115.88	0.00	0.00	0.01	39.57	0.00	0.00	0.00	38.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	0.00	60.78	0.00	176.86	0.00	250.41	0.00	28.36	0.00	53.65	0.00	38.16	0.00	58.75	0.00	3.66	0.00	3.09	0.00	7.79	0.00	7.09	0.00	26.23	0.00	0.48
p removal efficiency	%	100.00	54.53	0.00	39.59	100.00	0.00	100.00	58.25	100.00	0.00	100.00	50.38	0.00	0.00	100.00	0.02	100.00	0.03	100.00	0.01	100.00	0.01	100.00	0.00	100.00	0.16
upstream w-shed p load	lbs/yr	0.00	133.67	0.00	405.21	0.00	478.76	0.01	67.93	0.00	53.65	0.00	76.91	0.00	58.75	0.00	3.66	0.00	3.09	0.00	7.79	0.00	7.09	0.00	26.24	0.00	0.48
total removal %	%	100.00	54.53	0.00	56.35	100.00	47.70	100.00	58.26	100.00	0.00	100.00	50.38	0.00	0.00	100.00	0.02	100.00	0.03	100.00	0.01	100.00	0.01	100.00	0.01	100.00	0.16
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	4.61	1000001.00	5.05	1.00	0.10	1.00	3.37	1.00	0.10	1.00	2.89	1.00	0.00	1.00	0.10	1.00	0.10	1.00	0.10	1.00	0.10	1.00	0.10	1.00	0.10
relative volume	inches	0.00	1.99	0.00	2.42	0.00	0.00	0.00	4.46	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
residence time	years	87585.71	0.06	###########	0.03	87585.71	0.00	0.10	0.13	87585.71	0.00	87585.71	0.06	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00
residence time	days	31968784.45	20.94	###########	9.44	31968784.45	0.00	36.50	46.98	31968784.45	0.00	31968784.45	20.38	31968784.45	0.00	31968784.45	0.00	31968784.45	0.00	31968784.45	0.00	31968784.45	0.00	31968784.45	0.00	31968784.45	0.01
overflow rate	ft/yr	0.00	80.35	0.00	195.18	0.00	4624181.78	10.00	26.20	0.00	517286.39	0.00	51.83	0.00	0.94	0.00	33682.32	0.00	28422.86	0.00	71612.53	0.00	65895.18	0.00	242521.59	0.00	4537.40
inflow phos conc	ppb	366.44	380.16	366.44	275.92	366.44	199.24	250.01	386.03	366.44	381.55	366.44	361.51	366.44	385.03	366.44	400.02	366.44	400.02	366.44	400.02	366.44	395.81	366.44	398.00	366.44	391.51
outflow phos conc	ppb	366.44	172.87	366.44	166.70	366.44	199.24	250.01	161.15	366.44	381.55	366.44	179.39	366.44	385.03	366.44	399.93	366.44	399.91	366.44	399.98	366.44	395.76	366.44	397.99	366.44	390.89
p reaction rate	-	1.57	2.64	1567975.26	1.08	1.57	0.00	0.87	3.34	1.57	0.00	1.57	2.05	1.57	0.00	1.57	0.00	1.57	0.00	1.57	0.00	1.57	0.00	1.57	0.00	1.57	0.00
1-rp	-	1.00	0.45	1.00	0.60	1.00	1.00	1.00	0.42	1.00	1.00	1.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
vlawmo pond volume	acre-ft	0.00	9.34	0.00	10.44	0.00	5.20	0.00	4.67	0.00	3.74	0.00	5.65	0.00	4.05	0.00	0.24	0.00	0.21	0.00	0.52	0.00	0.48	0.00	1.28	0.00	0.03
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	376.31	0.00	379.65	0.00	375.79	250.00	376.12	0.00	365.23	0.00	365.69	0.00	374.49	0.00	400.00	0.00	400.00	0.00	400.00	0.00	395.26	0.00	398.54	0.00	391.49
runoff coefficient		0.00	0.22	0.00	0.22	0.00	0.24	0.09	0.20	0.00	0.22	0.00	0.38	0.00	0.20	0.00	0.28	0.00	0.28	0.00	0.28	0.00	0.24	0.00	0.27	0.00	0.22
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.30	0.31	0.00	0.33	0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	145.82	0.00	143.89	0.00	143.28	216.00	147.12	0.00	150.71	0.00	140.00	0.00	148.03	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.01
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	49935.12	0.00	55449.66	0.00	27591.69	7.28	25021.08	0.00	20079.46	0.00	29694.55	0.00	21769.10	0.00	1277.91	0.00	1078.37	0.00	2716.98	0.00	2500.07	0.00	6701.21	0.00	172.15
upstream pond	lbs/yr	0.00	0.00	0.00	25326.39	0.00	25848.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2500.07	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**49935.12**	**0.00**	**80776.05**	**0.00**	**53440.02**	**7.28**	**25021.08**	**0.00**	**20079.46**	**0.00**	**29694.55**	**0.00**	**21769.10**	**0.00**	**1277.91**	**0.00**	**1078.37**	**0.00**	**2716.98**	**0.00**	**2500.07**	**0.00**	**9201.28**	**0.00**	**172.15**
p removal efficiency (no inf)	%	0.00	57.00	0.00	42.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00	51.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	0.00	93.00	0.00	68.00	0.00	0.00	0.00	93.00	0.00	0.00	0.00	83.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
net sedimentation	lbs/yr	0.00	46439.66	0.00	54927.72	0.00	0.00	0.00	23269.61	0.00	0.00	0.00	24646.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
outflow	lbs/yr	0.00	3495.46	0.00	25848.34	0.00	53440.02	0.00	1751.48	0.00	20079.46	0.00	5048.07	0.00	21769.10	0.00	1277.91	0.00	1078.37	0.00	2716.98	0.00	2500.07	0.00	9201.28	0.00	172.15
tss removal efficiency (inf)	%	100.00	93.00	0.00	68.00	100.00	0.00	100.00	93.00	100.00	0.00	100.00	83.00	0.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00
upstream watershed tss load	lbs/yr	0.00	49935.12	0.00	150492.60	0.00	178084.29	7.28	25028.36	0.00	20079.46	0.00	29694.55	0.00	21769.10	0.00	1277.91	0.00	1078.37	0.00	2716.98	0.00	2500.07	0.00	9201.28	0.00	172.15
tss total removal efficiency	%	100.00	93.00	0.00	82.82	100.00	69.99	100.00	93.00	100.00	0.00	100.00	83.00	0.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**129.37**	**0.00**	**390.36**	**0.00**	**462.42**	**0.00**	**64.74**	**0.00**	**51.73**	**0.00**	**78.27**	**0.00**	**56.14**	**0.00**	**3.37**	**0.00**	**2.84**	**0.00**	**7.16**	**0.00**	**6.59**	**0.00**	**24.25**	**0.00**	**0.45**
Adjusted TP outflow	**lbs/yr**	**0.00**	**60.78**	**0.00**	**176.86**	**0.00**	**250.41**	**0.00**	**28.36**	**0.00**	**53.65**	**0.00**	**38.16**	**0.00**	**58.75**	**0.00**	**3.66**	**0.00**	**3.09**	**0.00**	**7.79**	**0.00**	**7.09**	**0.00**	**26.23**	**0.00**	**0.48**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**3495.46**	**0.00**	**25848.34**	**0.00**	**53440.02**	**0.00**	**1751.48**	**0.00**	**20079.46**	**0.00**	**5048.07**	**0.00**	**21769.10**	**0.00**	**1277.91**	**0.00**	**1078.37**	**0.00**	**2716.98**	**0.00**	**2500.07**	**0.00**	**9201.28**	**0.00**	**172.15**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	148.88	0.00	168.71	0.00	81.03	0.01	77.80	0.00	60.94	0.00	77.54	0.00	67.07	0.00	3.66	0.00	3.09	0.00	7.79	0.00	7.61	0.00	19.54	0.00	0.55
Adjusted TP outflow	**lbs/yr**	**0.00**	**65.15**	**0.00**	**190.81**	**0.00**	**271.84**	**0.01**	**30.88**	**0.00**	**60.94**	**0.00**	**38.37**	**0.00**	**67.07**	**0.00**	**3.66**	**0.00**	**3.09**	**0.00**	**7.79**	**0.00**	**7.61**	**0.00**	**27.14**	**0.00**	**0.55**
upstream pond	lbs/yr	0.00	0.00	0.00	156.97	0.00	190.81	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.61	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**148.88**	**0.00**	**325.68**	**0.00**	**271.84**	**0.01**	**77.80**	**0.00**	**60.94**	**0.00**	**77.54**	**0.00**	**67.07**	**0.00**	**3.66**	**0.00**	**3.09**	**0.00**	**7.79**	**0.00**	**7.61**	**0.00**	**27.15**	**0.00**	**0.55**
outflow	lbs/yr	0.00	65.15	0.00	190.81	0.00	271.84	0.01	30.88	0.00	60.94	0.00	38.37	0.00	67.07	0.00	3.66	0.00	3.09	0.00	7.79	0.00	7.61	0.00	27.14	0.00	0.55
inflow phos conc	ppb	381.54	423.42	381.54	306.96	381.54	216.29	250.01	442.19	381.54	433.45	381.54	364.50	381.54	439.59	381.54	400.02	381.54	400.02	381.54	400.02	381.54	424.81	381.54	411.81	381.54	450.01
outflow phos conc	ppb	381.54	185.29	381.54	179.84	381.54	216.29	250.01	175.50	381.54	433.44	381.54	180.37	381.54	439.59	381.54	399.93	381.54	399.92	381.54	399.98	381.54	424.76	381.54	411.80	381.54	449.18
p reaction rate	-	1.63	2.94	1632602.18	1.21	1.63	0.00	0.87	3.83	1.63	0.00	1.63	2.06	1.63	0.00	1.63	0.00	1.63	0.00	1.63	0.00	1.63	0.00	1.63	0.00	1.63	0.00
1-rp	-	1.00	0.44	1.00	0.59	1.00	1.00	1.00	0.40	1.00	1.00	1.00	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
runoff total p calc	ppb	0.00	421.19	0.00	428.95	0.00	418.15	250.00	428.89	0.00	412.85	0.00	369.80	0.00	425.74	0.00	400.00	0.00	400.00	0.00	400.00	0.00	427.88	0.00	408.58	0.00	449.98

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

copied from Loads-2 for accounting purposes

		Future exit 6	exit 6	Future exit 7	exit 7	BD-LL	EVR-LL	Lakeville	Burnsville	Rosemount	Eagan	WVR-LL	WVR-443
		exit 6	Eagan	exit 7	Rosemount	Burnsville	Lakeville					Lakeville	Lakeville
INPUT VARIABLES....	UNITS												
case label	-												
Total watershed area		0.00	884.6	0.00	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.0
Total watershed area (w/o wat	acres	0.00	884.6	0.00	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.3
basin area	acres	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.75
basin volume	acre-ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.48
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	6%	0%	70%	0%	0%	0%	0%	0%	0%	0%	68%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	27%	0%	0%	100%	100%	100%	100%	100%	100%	100%	0%
Golf Course		0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	1%	0%	30%	0%	0%	0%	0%	0%	0%	0%	28%
Minnesota Zoological Gardens		0%	46%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....													
tributary land area	ac	0.00	884.56	0.00	13.92	46.91	88.90	8491.83	1260.43	64.22	917.80	103.42	5111.03
tributary water area	ac	0.00	0.00	0.00	0.00	2.24	6.28	372.83	76.93	4.84	0.00	3.54	151.22
direct and ponded area	ac	0.00	884.56	0.00	13.92	49.16	95.18	8864.65	1337.35	69.06	917.80	106.96	5262.25
ASSUMED EXPORT FACTORS.....													
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	302.53	0.00	394.01	200.00	200.00	200.00	200.00	200.00	200.00	200.00	393.46
runoff ortho p/total p	-	0.30	0.45	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	3.80	0.00	8.07	1.73	1.73	1.73	1.73	1.73	1.73	1.73	8.21
unit export	lbs/ac-y	0.00	0.27	0.00	0.72	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.73
POND WATER BUDGETS.....													
runoff	ac-ft/yr	0.00	280.32	0.00	9.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	47.40
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	31.45	49.15	5706.49	793.05	40.84	305.03	56.00	3620.74
total inflow	**ac-ft/yr**	**0.00**	**280.32**	**0.00**	**9.36**	**31.45**	**49.15**	**5706.49**	**793.05**	**40.84**	**305.03**	**56.00**	**3668.14**
outflow	ac-ft/yr	0.00	280.32	0.00	9.36	31.45	49.15	5706.49	793.05	40.84	305.03	56.00	3668.14
POND PHOSPHORUS BUDGETS.....													
runoff	lbs/yr	0.00	240.71	0.00	10.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.70
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	21.41	32.65	2672.83	450.27	17.40	267.43	37.98	1686.51
total inflow	**lbs/yr**	**0.00**	**240.71**	**0.00**	**10.03**	**21.41**	**32.65**	**2672.83**	**450.27**	**17.40**	**267.43**	**37.98**	**1737.21**
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	224.03
outflow	lbs/yr	0.00	240.71	0.00	10.03	21.40	32.64	2672.82	450.26	17.40	267.42	37.97	1513.18
p removal efficiency	%	100.00	0.00	100.00	0.01	0.01	0.01	0.00	0.00	0.01	0.00	0.01	12.90
upstream w-shed p load	lbs/yr	0.00	240.71	0.00	10.03	33.64	50.77	6516.05	828.33	43.56	267.43	56.56	4162.13
total removal %	%	100.00	0.00	100.00	0.01	36.37	35.70	58.98	45.64	60.06	0.00	32.86	63.64
HYDRAULIC PARAMETERS.....													
pond mean depth	feet	1.00	0.10	1.00	0.10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	3.56
relative volume	inches	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.96
residence time	years	87585.71	0.00	87585.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
residence time	days	31968784.45	0.00	31968784.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04
overflow rate	ft/yr	0.00	2803249.00	0.00	93584.35	3144729.48	4914670.49	###########	79304924.12	4083667.67	30503081.29	5599939.76	637.94
inflow phos conc	ppb	366.44	315.93	366.44	394.49	250.44	244.40	172.33	208.89	156.74	322.56	249.52	174.24
outflow phos conc	ppb	366.44	315.93	366.44	394.46	250.40	244.38	172.33	208.89	156.73	322.56	249.50	151.77
p reaction rate	-	1.57	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
1-rp	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.87
vlawmo pond volume	acre-ft	0.00	20.24	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.42
LAND USE PARAMETERS.....													
runoff total P conc	ppb	0.00	302.53	0.00	394.01	200.00	200.00	200.00	200.00	200.00	200.00	200.00	393.46
runoff coefficient		0.00	0.11	0.00	0.23	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.24
dissolved/total P		0.00	0.45	0.00	0.30	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.30
runoff TSS conc	ppm	0.00	209.17	0.00	140.00	216.00	216.00	216.00	216.00	216.00	216.00	216.00	140.00
POND TSS BUDGETS.....													
runoff	lbs/yr	0.00	152492.03	0.00	3550.59	0.01	0.01	0.01	0.01	0.01	0.01	0.01	17983.98
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	4494.85	7606.09	492515.58	97949.19	4204.93	161865.46	8676.84	316598.16
total inflow	**lbs/yr**	**0.00**	**152492.03**	**0.00**	**3550.59**	**4494.86**	**7606.10**	**492515.59**	**97949.20**	**4204.94**	**161865.46**	**8676.84**	**334582.14**
p removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00
tss removal efficiency (no inf)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.46
net sedimentation	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98582.24
outflow	lbs/yr	0.00	152492.03	0.00	3550.59	4494.86	7606.10	492515.59	97949.20	4204.94	161865.46	8676.84	235999.91
tss removal efficiency (inf)	%	100.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.46
upstream watershed tss load	lbs/yr	0.00	152492.03	0.00	3550.59	11931.13	19438.18	2463992.40	304959.32	15493.45	161865.46	22871.96	1585000.15
tss total removal efficiency	%	100.00	0.00	100.00	0.00	62.33	60.87	80.01	67.88	72.86	0.00	62.06	85.11
INFILTRATION BMP/POND……													
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**280.32**	**0.00**	**9.36**	**31.45**	**49.15**	**5706.49**	**793.05**	**40.84**	**305.03**	**56.00**	**3668.14**
Adjusted TP outflow	**lbs/yr**	**0.00**	**240.71**	**0.00**	**10.03**	**21.40**	**32.64**	**2672.82**	**450.26**	**17.40**	**267.42**	**37.97**	**1513.18**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**152492.03**	**0.00**	**3550.59**	**4494.86**	**7606.10**	**492515.59**	**97949.20**	**4204.94**	**161865.46**	**8676.84**	**235999.91**

POND P BUDGETS W/O P-BAN…….													
runoff	lbs/yr	0.00	246.37	0.00	11.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.61
Adjusted TP outflow	**lbs/yr**	**0.00**	**246.36**	**0.00**	**11.00**	**23.07**	**36.13**	**3235.26**	**490.36**	**18.82**	**274.06**	**42.09**	**1771.15**
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	23.07	36.13	3235.26	490.36	18.82	274.06	42.10	2022.47
total inflow	**lbs/yr**	**0.00**	**246.37**	**0.00**	**11.00**	**23.07**	**36.13**	**3235.26**	**490.36**	**18.82**	**274.06**	**42.10**	**2078.08**
outflow	lbs/yr	0.00	246.36	0.00	11.00	23.07	36.13	3235.26	490.36	18.82	274.06	42.09	1771.15
inflow phos conc	ppb	381.54	323.35	381.54	432.54	269.91	270.49	208.59	227.49	169.60	330.57	276.57	208.43
outflow phos conc	ppb	381.54	323.35	381.54	432.50	269.87	270.46	208.59	227.49	169.58	330.56	276.54	177.65
p reaction rate	-	1.63	0.00	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1-rp	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85
runoff total p calc	ppb	0.00	306.32	0.00	435.23	200.00	200.00	200.00	200.00	200.00	200.00	200.00	434.80

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

Lake Alimagne

		Future AL-1	AL-1	Future AL-100	AL-100	Future AL-2	AL-2	Future AL-200	AL-200	Future AL-201	AL-201	Future AL-202	AL-202	Future AL-3	AL-3	Future AL-4	AL-4	Future AL-5	AL-5	Future AL-6	AL-6	Future AL-7	AL-7	Future AL-8	AL-8	Future AL-9	AL-9
		AL-1	AL-2	AL-100	AL-1	AL-2	AL-8	AL-200	AL-2	AL-201	AL-2	AL-202	AL-2	AL-3	AL-8	AL-4	AL-5	AL-5	AL-6	AL-6	AL-7	AL-7	AL-8	AL-8	AL-9	AL-9	WVR-40
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	3.8	0.00	11.1	0.00	56.7	0.00	1.9	0.00	4.2	0.00	10.2	0.00	11.6	0.00	13.0	0.00	40.9	0.00	22.4	0.00	2.6	0.05	42.5	0.00	194.3
Total watershed area (w/o wat	acres	0.00	3.3	0.00	10.7	0.00	55.7	0.00	1.8	0.00	4.2	0.00	9.7	0.00	11.3	0.00	12.7	0.00	40.0	0.00	21.7	0.00	2.1	0.05	41.7	0.00	150.2
basin area	acres	0.00	0.50	0.00	0.39	0.00	0.98	0.00	0.10	0.00	0.08	0.00	0.53	0.00	0.29	0.00	0.30	0.00	0.89	0.00	0.67	0.00	0.53	0.00	0.82	0.00	44.00
basin volume	acre-ft	0.00	0.59	0.00	0.39	0.00	1.80	0.00	0.04	0.00	0.03	0.00	0.65	0.00	0.24	0.00	0.13	0.00	1.74	0.00	1.76	0.00	0.54	0.00	2.16	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	0%	0%	3%	0%	2%	0%	0%	0%	0%	0%	0%	0%	11%	0%	95%	0%	92%	0%	95%	0%	100%	100%	55%	0%	47%
Medium Density Residential		0%	100%	0%	97%	0%	68%	0%	70%	0%	46%	0%	73%	0%	83%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	8%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	4%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	48%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	0%	0%	23%	0%	16%	0%	54%	0%	27%	0%	6%	0%	3%	0%	5%	0%	5%	0%	0%	0%	10%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	13.93	0.00	10.68	0.00	85.27	0.00	1.79	0.00	4.17	0.00	9.66	0.00	11.28	0.00	12.68	0.00	80.60	0.00	102.28	0.00	104.39	0.05	242.70	0.00	409.22
tributary water area	ac	0.00	0.89	0.00	0.39	0.00	2.58	0.00	0.10	0.00	0.08	0.00	0.53	0.00	0.29	0.00	0.30	0.00	2.08	0.00	2.76	0.00	3.29	0.00	6.97	0.00	51.54
direct and ponded area	ac	0.00	14.82	0.00	11.07	0.00	87.85	0.00	1.89	0.00	4.25	0.00	10.19	0.00	11.57	0.00	12.98	0.00	82.68	0.00	105.04	0.00	107.68	0.05	249.67	0.00	460.76
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.50	0.00	391.50	0.00	390.16	0.00	387.15	0.00	396.10	0.00	393.82	0.00	391.99	0.00	390.98	0.00	392.93	0.00	391.91	0.00	391.50	391.50	381.16	0.00	293.17
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.32	0.30	0.44
unit runoff	in/yr	0.00	10.60	0.00	10.52	0.00	10.63	0.00	11.01	0.00	10.03	0.00	10.31	0.00	10.19	0.00	7.69	0.00	7.44	0.00	7.55	0.00	7.45	7.45	8.24	0.00	4.52
unit export	lbs/ac-y	0.00	0.94	0.00	0.93	0.00	0.94	0.00	0.96	0.00	0.90	0.00	0.92	0.00	0.90	0.00	0.68	0.00	0.66	0.00	0.67	0.00	0.66	0.66	0.73	0.00	0.36
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	2.87	0.00	9.36	0.00	49.36	0.00	1.65	0.00	3.48	0.00	8.30	0.00	9.58	0.00	8.13	0.00	24.79	0.00	13.64	0.00	1.31	0.03	28.63	0.00	56.57
upstream pond	ac-ft/yr	0.00	9.36	0.00	0.00	0.00	25.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.53	0.00	45.32	0.00	58.97	0.00	144.88	0.00	181.56
total inflow	**ac-ft/yr**	**0.00**	**12.23**	**0.00**	**9.36**	**0.00**	**75.03**	**0.00**	**1.65**	**0.00**	**3.48**	**0.00**	**8.30**	**0.00**	**9.58**	**0.00**	**8.13**	**0.00**	**45.32**	**0.00**	**58.97**	**0.00**	**60.27**	**0.03**	**173.51**	**0.00**	**238.13**
outflow	ac-ft/yr	0.00	12.23	0.00	9.36	0.00	75.03	0.00	1.65	0.00	3.48	0.00	8.30	0.00	9.58	0.00	8.13	0.00	45.32	0.00	58.97	0.00	60.27	0.00	173.51	0.00	238.13
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	3.06	0.00	9.96	0.00	52.15	0.00	1.72	0.00	3.75	0.00	8.88	0.00	10.21	0.00	8.62	0.00	26.45	0.00	14.54	0.00	1.39	0.03	30.36	0.00	54.10
upstream pond	lbs/yr	0.00	6.01	0.00	0.00	0.00	14.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.57	0.00	23.73	0.00	24.43	0.00	71.06	0.00	84.26
total inflow	**lbs/yr**	**0.00**	**9.07**	**0.00**	**9.96**	**0.00**	**67.07**	**0.00**	**1.72**	**0.00**	**3.75**	**0.00**	**8.88**	**0.00**	**10.21**	**0.00**	**8.62**	**0.00**	**41.02**	**0.00**	**38.27**	**0.00**	**25.82**	**0.03**	**101.42**	**0.00**	**138.36**
net sedimentation	lbs/yr	0.00	3.28	0.00	3.95	0.00	24.92	0.00	0.45	0.00	0.73	0.00	4.04	0.00	3.48	0.00	2.15	0.00	17.29	0.00	13.84	0.00	3.64	0.03	23.46	0.00	0.00
outflow	lbs/yr	0.00	5.79	0.00	6.01	0.00	42.15	0.00	1.27	0.00	3.02	0.00	4.85	0.00	6.72	0.00	6.47	0.00	23.73	0.00	24.43	0.00	22.18	0.00	77.95	0.00	138.36
p removal efficiency	%	100.00	36.14	100.00	39.65	100.00	37.15	100.00	26.34	100.00	19.58	100.00	45.44	100.00	34.12	100.00	24.93	100.00	42.15	100.00	36.17	100.00	14.08	100.00	23.13	100.00	0.00
upstream w-shed p load	lbs/yr	0.00	13.02	0.00	9.96	0.00	79.52	0.00	1.72	0.00	3.75	0.00	8.88	0.00	10.21	0.00	8.62	0.00	49.92	0.00	64.45	0.00	65.85	0.03	185.96	0.00	249.32
total removal %	%	100.00	55.52	100.00	39.65	100.00	46.99	100.00	26.34	100.00	19.58	100.00	45.44	100.00	34.12	100.00	24.93	100.00	52.46	100.00	62.10	100.00	66.31	100.00	58.08	100.00	44.51
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.19	1.00	1.01	1.00	1.84	1.00	0.41	1.00	0.36	1.00	1.23	1.00	0.83	1.00	0.43	1.00	1.96	1.00	2.61	1.00	1.02	1.00	2.64	1.00	0.00
relative volume	inches	0.00	7.14	0.00	1.45	0.00	1.27	0.00	0.84	0.00	0.28	0.00	2.72	0.00	0.86	0.00	0.55	0.00	2.43	0.00	4.47	0.00	14.28	0.00	2.61	0.00	0.00
residence time	years	87585.71	0.05	87585.71	0.04	87585.71	0.02	87585.71	0.02	87585.71	0.01	87585.71	0.08	87585.71	0.02	87585.71	0.02	87585.71	0.04	87585.71	0.03	87585.71	0.01	0.10	0.01	87585.71	0.00
residence time	days	31968784.45	17.68	31968784.45	15.32	31968784.45	8.78	31968784.45	8.87	31968784.45	2.99	31968784.45	28.69	31968784.45	9.07	31968784.45	5.84	31968784.45	14.01	31968784.45	10.89	31968784.45	3.27	36.50	4.54	31968784.45	0.00
overflow rate	ft/yr	0.00	24.47	0.00	24.00	0.00	76.56	0.00	16.80	0.00	43.56	0.00	15.67	0.00	33.26	0.00	26.74	0.00	51.10	0.00	87.49	0.00	114.37	10.00	212.11	0.00	5.41
inflow phos conc	ppb	366.44	272.73	366.44	391.52	366.44	328.90	366.44	385.02	366.44	395.90	366.44	393.67	366.44	391.98	366.44	390.06	366.44	333.00	366.44	238.76	366.44	157.60	391.52	215.05	366.44	213.77
outflow phos conc	ppb	366.44	174.16	366.44	236.27	366.44	206.71	366.44	283.62	366.44	318.36	366.44	214.80	366.44	258.23	366.44	292.80	366.44	192.63	366.44	152.41	366.44	135.40	391.52	165.30	366.44	213.77
p reaction rate	-	1.57	0.89	1.57	1.09	1.57	0.94	1.57	0.49	1.57	0.30	1.57	1.53	1.57	0.79	1.57	0.44	1.57	1.26	1.57	0.89	1.57	0.19	1.36	0.39	1.57	0.00
1-rp	-	1.00	0.64	1.00	0.60	1.00	0.63	1.00	0.74	1.00	0.80	1.00	0.55	1.00	0.66	1.00	0.75	1.00	0.58	1.00	0.64	1.00	0.86	1.00	0.77	1.00	1.00
vlawmo pond volume	acre-ft	0.00	0.21	0.00	0.68	0.00	3.56	0.00	0.12	0.00	0.25	0.00	0.60	0.00	0.69	0.00	0.59	0.00	1.79	0.00	0.99	0.00	0.09	0.00	2.07	0.00	4.09
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.50	0.00	391.50	0.00	390.16	0.00	387.15	0.00	396.10	0.00	393.82	0.00	391.99	0.00	390.98	0.00	392.93	0.00	391.91	0.00	391.50	391.50	381.16	0.00	293.17
runoff coefficient		0.00	0.31	0.00	0.30	0.00	0.31	0.00	0.32	0.00	0.29	0.00	0.30	0.00	0.29	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.22	0.24	0.00	0.13
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.30	0.30	0.32	0.00	0.44
runoff TSS conc	ppm	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	142.12	0.00	140.00	0.00	140.00	140.00	144.45	0.00	179.90
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	1089.80	0.00	3551.23	0.00	18726.99	0.00	624.46	0.00	1322.14	0.00	3150.33	0.00	3634.23	0.00	3084.26	0.00	9467.87	0.00	5175.46	0.00	496.65	12.01	10935.03	0.00	23977.90
upstream pond	lbs/yr	0.00	1112.72	0.00	0.00	0.00	2584.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2854.66	0.00	3696.76	0.00	3194.00	0.00	11406.99	0.00	12711.09
total inflow	**lbs/yr**	**0.00**	**2202.51**	**0.00**	**3551.23**	**0.00**	**21311.72**	**0.00**	**624.46**	**0.00**	**1322.14**	**0.00**	**3150.33**	**0.00**	**3634.23**	**0.00**	**3084.26**	**0.00**	**12322.53**	**0.00**	**8872.22**	**0.00**	**3690.65**	**12.01**	**22342.02**	**0.00**	**36689.00**
p removal efficiency (no inf)	%	0.00	39.00	0.00	43.00	0.00	39.00	0.00	28.00	0.00	21.00	0.00	48.00	0.00	37.00	0.00	27.00	0.00	45.00	0.00	38.00	0.00	15.00	0.00	25.00	0.00	0.00
tss removal efficiency (no inf)	%	0.00	65.00	0.00	68.67	0.00	65.00	0.00	55.00	0.00	41.25	0.00	76.00	0.00	63.00	0.00	53.04	0.00	70.00	0.00	64.00	0.00	29.46	0.00	49.11	0.00	0.00
net sedimentation	lbs/yr	0.00	1431.63	0.00	2438.51	0.00	13852.62	0.00	343.45	0.00	545.38	0.00	2394.25	0.00	2289.56	0.00	1635.76	0.00	8625.77	0.00	5678.22	0.00	1087.42	0.00	10971.53	0.00	0.00
outflow	lbs/yr	0.00	770.88	0.00	1112.72	0.00	7459.10	0.00	281.01	0.00	776.76	0.00	756.08	0.00	1344.66	0.00	1448.50	0.00	3696.76	0.00	3194.00	0.00	2603.23	0.00	11370.49	0.00	36689.00
tss removal efficiency (inf)	%	100.00	65.00	100.00	68.67	100.00	65.00	100.00	55.00	100.00	41.25	100.00	76.00	100.00	63.00	100.00	53.04	100.00	70.00	100.00	64.00	100.00	29.46	100.00	49.11	100.00	0.00
upstream watershed tss load	lbs/yr	0.00	4641.02	0.00	3551.23	0.00	28464.95	0.00	624.46	0.00	1322.14	0.00	3150.33	0.00	3634.23	0.00	3084.26	0.00	18049.01	0.00	23224.46	0.00	23721.12	12.01	66767.33	0.00	94129.33
tss total removal efficiency	%	100.00	83.39	100.00	68.67	100.00	73.80	100.00	55.00	100.00	41.25	100.00	76.00	100.00	63.00	100.00	53.04	100.00	79.52	100.00	86.25	100.00	89.03	100.00	82.97	100.00	61.02
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**12.23**	**0.00**	**9.36**	**0.00**	**75.03**	**0.00**	**1.65**	**0.00**	**3.48**	**0.00**	**8.30**	**0.00**	**9.58**	**0.00**	**8.13**	**0.00**	**45.32**	**0.00**	**58.97**	**0.00**	**60.27**	**0.00**	**173.51**	**0.00**	**238.13**
Adjusted TP outflow	**lbs/yr**	**0.00**	**5.79**	**0.00**	**6.01**	**0.00**	**42.15**	**0.00**	**1.27**	**0.00**	**3.02**	**0.00**	**4.85**	**0.00**	**6.72**	**0.00**	**6.47**	**0.00**	**23.73**	**0.00**	**24.43**	**0.00**	**22.18**	**0.00**	**77.95**	**0.00**	**138.36**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**770.88**	**0.00**	**1112.72**	**0.00**	**7459.10**	**0.00**	**281.01**	**0.00**	**776.76**	**0.00**	**756.08**	**0.00**	**1344.66**	**0.00**	**1448.50**	**0.00**	**3696.76**	**0.00**	**3194.00**	**0.00**	**2603.23**	**0.00**	**11370.49**	**0.00**	**36689.00**
POND P BUDGETS W/O P-BAN……																											
runoff	lbs/yr	0.00	3.51	0.00	11.45	0.00	57.54	0.00	1.90	0.00	4.02	0.00	9.87	0.00	11.65	0.00	9.81	0.00	30.07	0.00	16.57	0.00	1.60	0.04	34.35	0.00	61.09
Adjusted TP outflow	**lbs/yr**	**0.00**	**6.29**	**0.00**	**6.64**	**0.00**	**45.09**	**0.00**	**1.37**	**0.00**	**3.19**	**0.00**	**5.21**	**0.00**	**7.41**	**0.00**	**7.17**	**0.00**	**25.61**	**0.00**	**26.23**	**0.00**	**23.68**	**0.04**	**83.59**	**0.00**	**151.52**
upstream pond	lbs/yr	0.00	6.64	0.00	0.00	0.00	16.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.69	0.00	25.61	0.00	26.23	0.00	76.23	0.00	90.43
total inflow	**lbs/yr**	**0.00**	**10.15**	**0.00**	**11.45**	**0.00**	**73.60**	**0.00**	**1.90**	**0.00**	**4.02**	**0.00**	**9.87**	**0.00**	**11.65**	**0.00**	**9.81**	**0.00**	**45.76**	**0.00**	**42.18**	**0.00**	**27.83**	**0.04**	**110.57**	**0.00**	**151.52**
outflow	lbs/yr	0.00	6.29	0.00	6.64	0.00	45.09	0.00	1.37	0.00	3.19	0.00	5.21	0.00	7.41	0.00	7.17	0.00	25.61	0.00	26.23	0.00	23.68	0.04	83.59	0.00	151.52
inflow phos conc	ppb	381.54	305.25	381.54	450.02	381.54	360.93	381.54	424.55	381.54	424.26	381.54	437.41	381.54	447.34	381.54	444.11	381.54	371.44	381.54	263.21	381.54	169.86	450.02	234.46	381.54	234.11
outflow phos conc	ppb	381.54	189.08	381.54	260.83	381.54	221.12	381.54	306.29	381.54	337.26	381.54	230.83	381.54	284.73	381.54	324.59	381.54	207.91	381.54	163.65	381.54	144.56	450.02	177.26	381.54	234.11
p reaction rate	-	1.63	0.99	1.63	1.25	1.63	1.03	1.63	0.54	1.63	0.32	1.63	1.70	1.63	0.90	1.63	0.50	1.63	1.41	1.63	0.98	1.63	0.21	1.57	0.43	1.63	0.00
1-rp	-	1.00	0.62	1.00	0.58	1.00	0.61	1.00	0.72	1.00	0.79	1.00	0.53	1.00	0.64	1.00	0.73	1.00	0.56	1.00	0.62	1.00	0.85	1.00	0.76	1.00	1.00
runoff total p calc	ppb	0.00	450.00	0.00	450.00	0.00	430.82	0.00	428.20	0.00	422.94	0.00	436.37	0.00	447.14	0.00	446.83	0.00	446.63	0.00	447.57	0.00	449.97	450.00	430.61	0.00	320.76

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS :t

		Future AL-11	AL-11	Future AL-12	AL-12	Future AL-13	AL-13	Future AL-14	AL-14	Future WVR-1	WVR-1	Future WVR-2	WVR-2	Future WVR-3	WVR-3	Future WVR-4	WVR-4	Future WVR-5	WVR-5	Future WVR-6	WVR-6	Future WVR-7	WVR-7	Future WVR-710	WVR-710	Future WVR-711	WVR-711
		AL-11	AL-13	AL-12	AL-LL	AL-13	AL-5	AL-14	AL-LL	WVR-1	WVR-2	WVR-2	WVR-5	WVR-3	WVR-5	WVR-4	WVR-5	WVR-5	WVR-17	WVR-6	WVR-111	WVR-7	WVR-711	WVR-710	WVR-7	WVR-711	WVR-LL
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	21.0	0.00	9.5	0.00	7.9	0.00	7.4	0.00	6.6	0.00	4.2	0.00	3.2	0.00	14.8	0.00	51.7	0.00	8.4	0.00	12.2	0.00	8.4	0.00	9.2
Total watershed area (w/o wat	acres	0.00	20.5	0.00	9.0	0.00	7.5	0.00	7.2	0.00	6.3	0.00	3.7	0.00	3.1	0.00	14.8	0.00	42.8	0.00	7.4	0.00	12.2	0.00	8.4	0.00	8.1
basin area	acres	0.00	0.48	0.00	0.43	0.00	0.42	0.00	0.14	0.00	0.36	0.00	0.59	0.00	0.13	0.00	0.00	0.00	8.90	0.00	0.94	0.00	0.00	0.00	0.00	0.00	1.15
basin volume	acre-ft	0.00	0.55	0.00	0.46	0.00	0.44	0.00	0.07	0.00	0.35	0.00	0.78	0.00	0.06	0.00	0.00	0.00	26.70	0.00	1.68	0.00	0.00	0.00	0.00	0.00	2.36
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	60%	0%	34%	0%	18%	0%	99%	0%	100%	0%	100%	0%	100%	0%	85%	0%	75%	0%	87%	0%	93%	0%	51%	0%	14%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	7%	0%	49%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	40%	0%	66%	0%	81%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	15%	0%	3%	0%	13%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	86%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	20.49	0.00	9.05	0.00	27.95	0.00	7.24	0.00	9.26	0.00	12.92	0.00	3.10	0.00	14.76	0.00	73.58	0.00	7.44	0.00	20.65	0.00	8.44	0.00	28.73
tributary water area	ac	0.00	0.48	0.00	0.43	0.00	0.89	0.00	0.14	0.00	0.72	0.00	1.31	0.00	0.13	0.00	0.00	0.00	10.34	0.00	0.94	0.00	0.00	0.00	0.00	0.00	1.15
direct and ponded area	ac	0.00	20.96	0.00	9.48	0.00	28.85	0.00	7.38	0.00	9.99	0.00	14.23	0.00	3.23	0.00	14.76	0.00	83.92	0.00	8.38	0.00	20.65	0.00	8.44	0.00	29.88
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	454.32	0.00	495.60	0.00	519.16	0.00	391.60	0.00	391.50	0.00	391.50	0.00	391.50	0.00	392.78	0.00	379.71	0.00	392.58	0.00	381.71	0.00	321.85	0.00	269.78
runoff ortho p/total p	-	0.30	0.46	0.30	0.56	0.30	0.62	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	5.80	0.00	4.69	0.00	4.03	0.00	7.47	0.00	7.45	0.00	7.45	0.00	7.45	0.00	7.76	0.00	8.13	0.00	7.71	0.00	7.16	0.00	5.38	0.00	4.74
unit export	lbs/ac-y	0.00	0.56	0.00	0.49	0.00	0.45	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.69	0.00	0.71	0.00	0.69	0.00	0.63	0.00	0.43	0.00	0.30
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	9.90	0.00	3.54	0.00	2.51	0.00	4.51	0.00	3.89	0.00	2.27	0.00	1.92	0.00	9.55	0.00	29.01	0.00	4.78	0.00	7.28	0.00	3.78	0.00	3.19
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	0.00	9.90	0.00	0.00	0.00	1.86	0.00	5.75	0.00	0.00	0.00	0.00	0.00	19.49	0.00	0.00	0.00	3.78	0.00	0.00	0.00	11.06
total inflow	**ac-ft/yr**	**0.00**	**9.90**	**0.00**	**3.54**	**0.00**	**12.40**	**0.00**	**4.51**	**0.00**	**5.75**	**0.00**	**8.02**	**0.00**	**1.92**	**0.00**	**9.55**	**0.00**	**48.49**	**0.00**	**4.78**	**0.00**	**11.06**	**0.00**	**3.78**	**0.00**	**14.25**
outflow	ac-ft/yr	0.00	9.90	0.00	3.54	0.00	12.40	0.00	4.51	0.00	5.75	0.00	8.02	0.00	1.92	0.00	9.55	0.00	48.49	0.00	4.78	0.00	11.06	0.00	3.78	0.00	14.25
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	11.48	0.00	4.46	0.00	3.37	0.00	4.80	0.00	4.14	0.00	2.41	0.00	2.05	0.00	10.20	0.00	30.51	0.00	5.10	0.00	7.66	0.00	3.59	0.00	2.44
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	7.23	0.00	0.00	0.00	1.10	0.00	3.23	0.00	0.00	0.00	0.00	0.00	15.02	0.00	0.00	0.00	3.59	0.00	0.00	0.00	11.25
total inflow	**lbs/yr**	**0.00**	**11.48**	**0.00**	**4.46**	**0.00**	**10.60**	**0.00**	**4.80**	**0.00**	**5.24**	**0.00**	**5.64**	**0.00**	**2.05**	**0.00**	**10.20**	**0.00**	**45.53**	**0.00**	**5.10**	**0.00**	**11.25**	**0.00**	**3.59**	**0.00**	**13.69**
net sedimentation	lbs/yr	0.00	4.24	0.00	1.67	0.00	2.50	0.00	1.28	0.00	2.01	0.00	2.26	0.00	0.61	0.00	0.00	0.00	27.66	0.00	2.80	0.00	0.00	0.00	0.00	0.00	7.27
outflow	lbs/yr	0.00	7.23	0.00	2.79	0.00	8.10	0.00	3.52	0.00	3.23	0.00	3.38	0.00	1.44	0.00	10.20	0.00	17.87	0.00	2.30	0.00	11.25	0.00	3.59	0.00	6.42
p removal efficiency	%	100.00	36.98	100.00	37.45	100.00	23.58	100.00	26.69	100.00	38.35	100.00	40.05	100.00	29.82	100.00	0.01	100.00	60.74	100.00	54.89	100.00	0.01	100.00	0.02	100.00	53.10
upstream w-shed p load	lbs/yr	0.00	11.48	0.00	4.46	0.00	14.85	0.00	4.80	0.00	6.12	0.00	8.53	0.00	2.05	0.00	10.20	0.00	51.29	0.00	5.10	0.00	11.25	0.00	3.59	0.00	13.69
total removal %	%	100.00	36.98	100.00	37.45	100.00	45.43	100.00	26.69	100.00	47.22	100.00	60.35	100.00	29.82	100.00	0.01	100.00	65.15	100.00	54.89	100.00	0.01	100.00	0.02	100.00	53.11
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	1.15	1.00	1.08	1.00	1.05	1.00	0.52	1.00	0.96	1.00	1.32	1.00	0.49	1.00	0.10	1.00	3.00	1.00	1.79	1.00	0.10	1.00	0.10	1.00	2.05
relative volume	inches	0.00	1.92	0.00	4.54	0.00	6.03	0.00	0.55	0.00	3.09	0.00	11.86	0.00	1.12	0.00	0.00	0.00	31.87	0.00	12.20	0.00	0.00	0.00	0.00	0.00	25.68
residence time	years	87585.71	0.06	87585.71	0.13	87585.71	0.04	87585.71	0.02	87585.71	0.06	87585.71	0.10	87585.71	0.03	87585.71	0.00	87585.71	0.55	87585.71	0.35	87585.71	0.00	87585.71	0.00	87585.71	0.17
residence time	days	31968784.45	20.22	31968784.45	47.84	31968784.45	12.87	31968784.45	5.84	31968784.45	22.06	31968784.45	35.39	31968784.45	11.80	31968784.45	0.00	31968784.45	200.96	31968784.45	128.58	31968784.45	0.00	31968784.45	0.00	31968784.45	60.56
overflow rate	ft/yr	0.00	20.75	0.00	8.21	0.00	29.82	0.00	32.22	0.00	15.88	0.00	13.61	0.00	15.03	0.00	95475.87	0.00	5.45	0.00	5.09	0.00	110646.23	0.00	37821.48	0.00	12.35
inflow phos conc	ppb	366.44	426.74	366.44	463.54	366.44	314.53	366.44	391.66	366.44	335.19	366.44	258.96	366.44	391.52	366.44	393.09	366.44	345.43	366.44	392.85	366.44	374.22	366.44	349.51	366.44	353.37
outflow phos conc	ppb	366.44	268.95	366.44	289.93	366.44	240.35	366.44	287.11	366.44	206.65	366.44	155.24	366.44	274.77	366.44	393.06	366.44	135.60	366.44	177.22	366.44	374.19	366.44	349.45	366.44	165.72
p reaction rate	-	1.57	0.93	1.57	0.96	1.57	0.40	1.57	0.50	1.57	1.01	1.57	1.11	1.57	0.61	1.57	0.00	1.57	3.94	1.57	2.70	1.57	0.00	1.57	0.00	1.57	2.41
1-rp	-	1.00	0.63	1.00	0.63	1.00	0.76	1.00	0.73	1.00	0.62	1.00	0.60	1.00	0.70	1.00	1.00	1.00	0.39	1.00	0.45	1.00	1.00	1.00	1.00	1.00	0.47
vlawmo pond volume	acre-ft	0.00	0.71	0.00	0.26	0.00	0.18	0.00	0.33	0.00	0.28	0.00	0.16	0.00	0.14	0.00	0.69	0.00	2.09	0.00	0.35	0.00	0.53	0.00	0.27	0.00	0.23
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	454.32	0.00	495.60	0.00	519.16	0.00	391.60	0.00	391.50	0.00	391.50	0.00	391.50	0.00	392.78	0.00	379.71	0.00	392.58	0.00	381.71	0.00	321.85	0.00	269.78
runoff coefficient		0.00	0.17	0.00	0.14	0.00	0.12	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.23	0.00	0.22	0.00	0.21	0.00	0.16	0.00	0.14
dissolved/total P		0.00	0.46	0.00	0.56	0.00	0.62	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	170.09	0.00	189.91	0.00	202.03	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	146.46	0.00	140.00	0.00	145.26	0.00	177.41	0.00	205.38
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	4205.99	0.00	1672.76	0.00	1290.88	0.00	1711.33	0.00	1474.38	0.00	860.58	0.00	730.15	0.00	3622.36	0.00	11207.64	0.00	1813.84	0.00	2810.02	0.00	1666.23	0.00	1721.82
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	1472.09	0.00	0.00	0.00	183.66	0.00	547.15	0.00	0.00	0.00	0.00	0.00	4369.46	0.00	0.00	0.00	1666.23	0.00	0.00	0.00	4476.25
total inflow	**lbs/yr**	**0.00**	**4205.99**	**0.00**	**1672.76**	**0.00**	**2762.98**	**0.00**	**1711.33**	**0.00**	**1658.04**	**0.00**	**1407.74**	**0.00**	**730.15**	**0.00**	**3622.36**	**0.00**	**15577.10**	**0.00**	**1813.84**	**0.00**	**4476.25**	**0.00**	**1666.23**	**0.00**	**6198.07**
p removal efficiency (no inf)	%	0.00	39.00	0.00	39.00	0.00	25.00	0.00	29.00	0.00	41.00	0.00	42.00	0.00	33.00	0.00	0.00	0.00	63.00	0.00	57.00	0.00	0.00	0.00	0.00	0.00	55.00
tss removal efficiency (no inf)	%	0.00	65.00	0.00	65.00	0.00	49.11	0.00	55.88	0.00	67.00	0.00	68.00	0.00	59.38	0.00	0.00	0.00	93.00	0.00	93.00	0.00	0.00	0.00	0.00	0.00	91.50
net sedimentation	lbs/yr	0.00	2733.89	0.00	1087.30	0.00	1356.82	0.00	956.20	0.00	1110.88	0.00	957.26	0.00	433.53	0.00	0.00	0.00	14486.70	0.00	1686.87	0.00	0.00	0.00	0.00	0.00	5671.23
outflow	lbs/yr	0.00	1472.09	0.00	585.47	0.00	1406.16	0.00	755.12	0.00	547.15	0.00	450.48	0.00	296.62	0.00	3622.36	0.00	1090.40	0.00	126.97	0.00	4476.25	0.00	1666.23	0.00	526.84
tss removal efficiency (inf)	%	100.00	65.00	100.00	65.00	100.00	49.11	100.00	55.88	100.00	67.00	100.00	68.00	100.00	59.38	100.00	0.00	100.00	93.00	100.00	93.00	100.00	0.00	100.00	0.00	100.00	91.50
upstream watershed tss load	lbs/yr	0.00	4205.99	0.00	1672.76	0.00	5496.87	0.00	1711.33	0.00	2180.75	0.00	3041.33	0.00	730.15	0.00	3622.36	0.00	18601.48	0.00	1813.84	0.00	4476.25	0.00	1666.23	0.00	6198.07
tss total removal efficiency	%	100.00	65.00	100.00	65.00	100.00	74.42	100.00	55.88	100.00	74.91	100.00	85.19	100.00	59.38	100.00	0.00	100.00	94.14	100.00	93.00	100.00	0.00	100.00	0.00	100.00	91.50
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**9.90**	**0.00**	**3.54**	**0.00**	**12.40**	**0.00**	**4.51**	**0.00**	**5.75**	**0.00**	**8.02**	**0.00**	**1.92**	**0.00**	**9.55**	**0.00**	**48.49**	**0.00**	**4.78**	**0.00**	**11.06**	**0.00**	**3.78**	**0.00**	**14.25**
Adjusted TP outflow	**lbs/yr**	**0.00**	**7.23**	**0.00**	**2.79**	**0.00**	**8.10**	**0.00**	**3.52**	**0.00**	**3.23**	**0.00**	**3.38**	**0.00**	**1.44**	**0.00**	**10.20**	**0.00**	**17.87**	**0.00**	**2.30**	**0.00**	**11.25**	**0.00**	**3.59**	**0.00**	**6.42**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**1472.09**	**0.00**	**585.47**	**0.00**	**1406.16**	**0.00**	**755.12**	**0.00**	**547.15**	**0.00**	**450.48**	**0.00**	**296.62**	**0.00**	**3622.36**	**0.00**	**1090.40**	**0.00**	**126.97**	**0.00**	**4476.25**	**0.00**	**1666.23**	**0.00**	**526.84**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	12.69	0.00	4.76	0.00	3.50	0.00	5.51	0.00	4.75	0.00	2.77	0.00	2.35	0.00	11.44	0.00	34.82	0.00	5.75	0.00	8.78	0.00	4.02	0.00	2.55
Adjusted TP outflow	**lbs/yr**	**0.00**	**7.78**	**0.00**	**2.92**	**0.00**	**8.52**	**0.00**	**3.92**	**0.00**	**3.54**	**0.00**	**3.67**	**0.00**	**1.60**	**0.00**	**11.44**	**0.00**	**19.29**	**0.00**	**2.48**	**0.00**	**12.80**	**0.00**	**4.01**	**0.00**	**6.91**
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	7.78	0.00	0.00	0.00	1.21	0.00	3.54	0.00	0.00	0.00	0.00	0.00	16.70	0.00	0.00	0.00	4.01	0.00	0.00	0.00	12.80
total inflow	**lbs/yr**	**0.00**	**12.69**	**0.00**	**4.76**	**0.00**	**11.28**	**0.00**	**5.51**	**0.00**	**5.96**	**0.00**	**6.32**	**0.00**	**2.35**	**0.00**	**11.44**	**0.00**	**51.52**	**0.00**	**5.75**	**0.00**	**12.80**	**0.00**	**4.02**	**0.00**	**15.34**
outflow	lbs/yr	0.00	7.78	0.00	2.92	0.00	8.52	0.00	3.92	0.00	3.54	0.00	3.67	0.00	1.60	0.00	11.44	0.00	19.29	0.00	2.48	0.00	12.80	0.00	4.01	0.00	6.91
inflow phos conc	ppb	381.54	471.64	381.54	495.24	381.54	334.54	381.54	449.23	381.54	381.81	381.54	290.02	381.54	450.02	381.54	440.78	381.54	390.86	381.54	442.18	381.54	425.57	381.54	390.64	381.54	396.11
outflow phos conc	ppb	381.54	289.20	381.54	304.16	381.54	252.61	381.54	319.64	381.54	226.87	381.54	168.23	381.54	305.60	381.54	440.74	381.54	146.37	381.54	191.19	381.54	425.54	381.54	390.56	381.54	178.47
p reaction rate	-	1.63	1.03	1.63	1.02	1.63	0.43	1.63	0.57	1.63	1.15	1.63	1.25	1.63	0.70	1.63	0.00	1.63	4.46	1.63	3.04	1.63	0.00	1.63	0.00	1.63	2.71
1-rp	-	1.00	0.61	1.00	0.61	1.00	0.76	1.00	0.71	1.00	0.59	1.00	0.58	1.00	0.68	1.00	1.00	1.00	0.37	1.00	0.43	1.00	1.00	1.00	1.00	1.00	0.45
runoff total p calc	ppb	0.00	489.27	0.00	515.57	0.00	529.50	0.00	449.38	0.00	450.00	0.00	450.00	0.00	450.00	0.00	442.48	0.00	431.63	0.00	443.67	0.00	436.16	0.00	351.55	0.00	277.95

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-8	WVR-8	Future WVR-9	WVR-9	Future WVR-10	WVR-10	Future WVR-11	WVR-11	Future WVR-111	WVR-111	Future WVR-112	WVR-112	Future WVR-113	WVR-113	Future WVR-12	WVR-12	Future WVR-13	WVR-13	Future WVR-130	WVR-130	Future WVR-14	WVR-14	Future WVR-15	WVR-15	Future WVR-16	WVR-16
		WVR-8	WVR-9	WVR-9	WVR-17	WVR-10	WVR-LL	WVR-11	WVR-17	WVR-111	WVR-17	WVR-112	WVR-11	WVR-113	WVR-112	WVR-12	WVR-17	WVR-13	WVR-17	WVR-130	WVR-17	WVR-14	WVR-LL	WVR-15	WVR-LL	WVR-16	WVR-LL
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	15.4	0.00	39.1	0.00	9.5	0.00	8.5	0.00	12.2	0.00	11.3	0.00	12.4	0.00	2.4	0.00	91.0	0.00	15.4	0.00	11.9	0.00	8.3	0.00	7.0
Total watershed area (w/o wat	acres	0.00	15.2	0.00	37.8	0.00	8.9	0.00	8.2	0.00	12.0	0.00	11.3	0.00	12.3	0.00	2.2	0.00	91.0	0.00	15.4	0.00	10.9	0.00	8.0	0.00	6.9
basin area	acres	0.00	0.29	0.00	1.33	0.00	0.58	0.00	0.33	0.00	0.15	0.00	0.08	0.00	0.12	0.00	0.15	0.00	0.00	0.00	0.08	0.00	0.92	0.00	0.37	0.00	0.09
basin volume	acre-ft	0.00	0.24	0.00	2.98	0.00	0.76	0.00	0.30	0.00	0.08	0.00	0.00	0.00	0.06	0.00	0.08	0.00	0.00	0.00	0.03	0.00	1.63	0.00	0.36	0.00	0.04
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	100%	0%	100%	0%	97%	0%	58%	0%	99%	0%	100%	0%	99%	0%	13%	0%	40%	0%	46%	0%	61%	0%	61%	0%	26%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	69%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	41%	0%	0%	0%	0%	0%	1%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	17%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	18%	0%	19%	0%	39%	0%	74%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	17%	0%	42%	0%	18%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	15.16	0.00	52.97	0.00	8.91	0.00	31.76	0.00	19.47	0.00	23.56	0.00	12.31	0.00	2.22	0.00	91.02	0.00	15.35	0.00	10.93	0.00	7.96	0.00	6.90
tributary water area	ac	0.00	0.29	0.00	1.61	0.00	0.58	0.00	0.53	0.00	1.09	0.00	0.20	0.00	0.12	0.00	0.15	0.00	0.00	0.00	0.08	0.00	0.92	0.00	0.37	0.00	0.09
direct and ponded area	ac	0.00	15.44	0.00	54.58	0.00	9.49	0.00	32.29	0.00	20.56	0.00	23.76	0.00	12.43	0.00	2.37	0.00	91.02	0.00	15.43	0.00	11.85	0.00	8.34	0.00	7.00
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	390.80	0.00	391.50	0.00	391.53	0.00	374.31	0.00	391.54	0.00	391.43	0.00	391.13	0.00	392.98	0.00	387.84	0.00	360.28	0.00	336.58	0.00	336.99	0.00	286.09
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.43	0.00	7.45	0.00	7.67	0.00	10.50	0.00	7.46	0.00	7.46	0.00	7.51	0.00	12.92	0.00	8.76	0.00	7.81	0.00	6.02	0.00	5.83	0.00	4.32
unit export	lbs/ac-y	0.00	0.66	0.00	0.66	0.00	0.68	0.00	0.87	0.00	0.66	0.00	0.66	0.00	0.66	0.00	1.15	0.00	0.77	0.00	0.66	0.00	0.49	0.00	0.48	0.00	0.31
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	9.38	0.00	23.46	0.00	5.69	0.00	7.18	0.00	7.47	0.00	6.99	0.00	7.71	0.00	2.39	0.00	66.42	0.00	10.00	0.00	5.48	0.00	3.87	0.00	2.48
upstream pond	ac-ft/yr	0.00	0.00	0.00	9.38	0.00	0.00	0.00	14.70	0.00	4.78	0.00	7.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**0.00**	**9.38**	**0.00**	**32.84**	**0.00**	**5.69**	**0.00**	**21.88**	**0.00**	**12.26**	**0.00**	**14.70**	**0.00**	**7.71**	**0.00**	**2.39**	**0.00**	**66.42**	**0.00**	**10.00**	**0.00**	**5.48**	**0.00**	**3.87**	**0.00**	**2.48**
outflow	ac-ft/yr	0.00	9.38	0.00	32.84	0.00	5.69	0.00	21.88	0.00	12.26	0.00	14.70	0.00	7.71	0.00	2.39	0.00	66.42	0.00	10.00	0.00	5.48	0.00	3.87	0.00	2.48
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	9.97	0.00	24.97	0.00	6.06	0.00	7.16	0.00	7.96	0.00	7.44	0.00	8.19	0.00	2.55	0.00	70.47	0.00	10.11	0.00	5.32	0.00	3.80	0.00	2.11
upstream pond	lbs/yr	0.00	0.00	0.00	6.57	0.00	0.00	0.00	13.98	0.00	2.30	0.00	6.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**9.97**	**0.00**	**31.54**	**0.00**	**6.06**	**0.00**	**21.14**	**0.00**	**10.26**	**0.00**	**13.98**	**0.00**	**8.19**	**0.00**	**2.55**	**0.00**	**70.47**	**0.00**	**10.11**	**0.00**	**5.32**	**0.00**	**3.80**	**0.00**	**2.11**
net sedimentation	lbs/yr	0.00	3.40	0.00	16.18	0.00	2.92	0.00	5.96	0.00	1.78	0.00	0.00	0.00	1.65	0.00	0.80	0.00	0.00	0.00	1.16	0.00	2.81	0.00	1.58	0.00	0.43
outflow	lbs/yr	0.00	6.57	0.00	15.36	0.00	3.14	0.00	15.18	0.00	8.48	0.00	13.98	0.00	6.54	0.00	1.75	0.00	70.47	0.00	8.94	0.00	2.51	0.00	2.22	0.00	1.68
p removal efficiency	%	100.00	34.12	0.00	51.31	100.00	48.16	100.00	28.21	100.00	17.34	100.00	0.00	100.00	20.11	100.00	31.30	100.00	0.00	100.00	11.52	100.00	52.88	100.00	41.63	100.00	20.30
upstream w-shed p load	lbs/yr	0.00	9.97	0.00	34.94	0.00	6.06	0.00	22.79	0.00	13.06	0.00	15.63	0.00	8.19	0.00	2.55	0.00	70.47	0.00	10.11	0.00	5.32	0.00	3.80	0.00	2.11
total removal %	%	100.00	34.12	0.00	56.05	100.00	48.16	100.00	33.40	100.00	35.07	100.00	10.54	100.00	20.11	100.00	31.30	100.00	0.00	100.00	11.52	100.00	52.88	100.00	41.63	100.00	20.30
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	0.82	1.00	2.24	1.00	1.31	1.00	0.90	1.00	0.55	1.00	0.00	1.00	0.47	1.00	0.54	1.00	0.10	1.00	0.36	1.00	1.77	1.00	0.98	1.00	0.39
relative volume	inches	0.00	0.87	0.00	4.39	0.00	4.64	0.00	1.44	0.00	0.39	0.00	0.00	0.00	0.25	0.00	1.17	0.00	0.00	0.00	0.10	0.00	10.32	0.00	3.27	0.00	0.49
residence time	years	87585.71	0.03	87585.71	0.09	87585.71	0.13	87585.71	0.01	87585.71	0.01	87585.71	0.00	87585.71	0.01	87585.71	0.03	87585.71	0.00	87585.71	0.00	87585.71	0.30	87585.71	0.09	87585.71	0.01
residence time	days	31968784.45	9.15	31968784.45	33.07	31968784.45	48.87	31968784.45	5.00	31968784.45	2.49	31968784.45	0.00	31968784.45	2.65	31968784.45	12.33	31968784.45	0.00	31968784.45	1.04	31968784.45	108.78	31968784.45	34.45	31968784.45	5.20
overflow rate	ft/yr	0.00	32.79	0.00	24.77	0.00	9.78	0.00	66.10	0.00	80.10	0.00	183.75	0.00	64.22	0.00	15.95	0.00	664212.81	0.00	124.94	0.00	5.94	0.00	10.37	0.00	27.29
inflow phos conc	ppb	366.44	391.21	366.44	353.32	366.44	391.55	366.44	355.57	366.44	307.96	366.44	349.87	366.44	390.80	366.44	392.61	366.44	390.34	366.44	371.99	366.44	357.13	366.44	361.18	366.44	312.29
outflow phos conc	ppb	366.44	257.75	366.44	172.04	366.44	202.99	366.44	255.26	366.44	254.56	366.44	349.86	366.44	312.20	366.44	269.73	366.44	390.33	366.44	329.13	366.44	168.29	366.44	210.82	366.44	248.90
p reaction rate	-	1.57	0.79	1.57	2.16	1.57	1.79	1.57	0.55	1.57	0.25	1.57	0.00	1.57	0.32	1.57	0.66	1.57	0.00	1.57	0.15	1.57	2.38	1.57	1.22	1.57	0.32
1-rp	-	1.00	0.66	1.00	0.49	1.00	0.52	1.00	0.72	1.00	0.83	1.00	1.00	1.00	0.80	1.00	0.69	1.00	1.00	1.00	0.88	1.00	0.47	1.00	0.58	1.00	0.80
vlawmo pond volume	acre-ft	0.00	0.68	0.00	1.69	0.00	0.41	0.00	0.52	0.00	0.54	0.00	0.51	0.00	0.56	0.00	0.17	0.00	4.80	0.00	0.72	0.00	0.40	0.00	0.28	0.00	0.18
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	390.80	0.00	391.50	0.00	391.53	0.00	374.31	0.00	391.54	0.00	391.43	0.00	391.13	0.00	392.98	0.00	387.84	0.00	360.28	0.00	336.58	0.00	336.99	0.00	286.09
runoff coefficient		0.00	0.21	0.00	0.22	0.00	0.22	0.00	0.30	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.37	0.00	0.25	0.00	0.23	0.00	0.17	0.00	0.17	0.00	0.12
dissolved/total P		0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	140.38	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	142.67	0.00	153.72	0.00	169.50	0.00	169.28	0.00	196.61
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	3562.37	0.00	8902.57	0.00	2159.03	0.00	2722.99	0.00	2835.99	0.00	2653.41	0.00	2923.91	0.00	907.95	0.00	25377.95	0.00	3946.46	0.00	2354.63	0.00	1637.84	0.00	1228.47
upstream pond	lbs/yr	0.00	0.00	0.00	1318.08	0.00	0.00	0.00	4313.77	0.00	126.97	0.00	1660.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**3562.37**	**0.00**	**10220.65**	**0.00**	**2159.03**	**0.00**	**7036.77**	**0.00**	**2962.96**	**0.00**	**4313.77**	**0.00**	**2923.91**	**0.00**	**907.95**	**0.00**	**25377.95**	**0.00**	**3946.46**	**0.00**	**2354.63**	**0.00**	**1637.84**	**0.00**	**1228.47**
p removal efficiency (no inf)	%	0.00	37.00	0.00	54.00	0.00	51.00	0.00	30.00	0.00	19.00	0.00	0.00	0.00	22.00	0.00	34.00	0.00	0.00	0.00	13.00	0.00	55.00	0.00	44.00	0.00	22.00
tss removal efficiency (no inf)	%	0.00	63.00	0.00	90.00	0.00	83.00	0.00	56.75	0.00	37.32	0.00	0.00	0.00	43.21	0.00	60.25	0.00	0.00	0.00	25.54	0.00	91.50	0.00	69.33	0.00	43.21
net sedimentation	lbs/yr	0.00	2244.29	0.00	9198.58	0.00	1791.99	0.00	3993.37	0.00	1105.82	0.00	0.00	0.00	1263.55	0.00	547.04	0.00	0.00	0.00	1007.76	0.00	2154.48	0.00	1135.57	0.00	530.87
outflow	lbs/yr	0.00	1318.08	0.00	1022.06	0.00	367.03	0.00	3043.40	0.00	1857.14	0.00	4313.77	0.00	1660.36	0.00	360.91	0.00	25377.95	0.00	2938.70	0.00	200.14	0.00	502.27	0.00	697.59
tss removal efficiency (inf)	%	100.00	63.00	0.00	90.00	100.00	83.00	100.00	56.75	100.00	37.32	100.00	0.00	100.00	43.21	100.00	60.25	100.00	0.00	100.00	25.54	100.00	91.50	100.00	69.33	100.00	43.21
upstream watershed tss load	lbs/yr	0.00	3562.37	0.00	12464.94	0.00	2159.03	0.00	8300.31	0.00	4649.83	0.00	5577.32	0.00	2923.91	0.00	907.95	0.00	25377.95	0.00	3946.46	0.00	2354.63	0.00	1637.84	0.00	1228.47
tss total removal efficiency	%	100.00	63.00	0.00	91.80	100.00	83.00	100.00	63.33	100.00	60.06	100.00	22.66	100.00	43.21	100.00	60.25	100.00	0.00	100.00	25.54	100.00	91.50	100.00	69.33	100.00	43.21
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**9.38**	**0.00**	**32.84**	**0.00**	**5.69**	**0.00**	**21.88**	**0.00**	**12.26**	**0.00**	**14.70**	**0.00**	**7.71**	**0.00**	**2.39**	**0.00**	**66.42**	**0.00**	**10.00**	**0.00**	**5.48**	**0.00**	**3.87**	**0.00**	**2.48**
Adjusted TP outflow	**lbs/yr**	**0.00**	**6.57**	**0.00**	**15.36**	**0.00**	**3.14**	**0.00**	**15.18**	**0.00**	**8.48**	**0.00**	**13.98**	**0.00**	**6.54**	**0.00**	**1.75**	**0.00**	**70.47**	**0.00**	**8.94**	**0.00**	**2.51**	**0.00**	**2.22**	**0.00**	**1.68**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**1318.08**	**0.00**	**1022.06**	**0.00**	**367.03**	**0.00**	**3043.40**	**0.00**	**1857.14**	**0.00**	**4313.77**	**0.00**	**1660.36**	**0.00**	**360.91**	**0.00**	**25377.95**	**0.00**	**2938.70**	**0.00**	**200.14**	**0.00**	**502.27**	**0.00**	**697.59**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	11.46	0.00	28.70	0.00	6.96	0.00	7.64	0.00	9.14	0.00	8.55	0.00	9.39	0.00	2.89	0.00	75.22	0.00	10.81	0.00	5.98	0.00	4.28	0.00	2.28
Adjusted TP outflow	**lbs/yr**	**0.00**	**7.28**	**0.00**	**16.74**	**0.00**	**3.44**	**0.00**	**16.48**	**0.00**	**9.42**	**0.00**	**15.87**	**0.00**	**7.32**	**0.00**	**1.92**	**0.00**	**75.22**	**0.00**	**9.49**	**0.00**	**2.71**	**0.00**	**2.41**	**0.00**	**1.79**
upstream pond	lbs/yr	0.00	0.00	0.00	7.28	0.00	0.00	0.00	15.87	0.00	2.48	0.00	7.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**11.46**	**0.00**	**35.98**	**0.00**	**6.96**	**0.00**	**23.51**	**0.00**	**11.62**	**0.00**	**15.87**	**0.00**	**9.39**	**0.00**	**2.89**	**0.00**	**75.22**	**0.00**	**10.81**	**0.00**	**5.98**	**0.00**	**4.28**	**0.00**	**2.28**
outflow	lbs/yr	0.00	7.28	0.00	16.74	0.00	3.44	0.00	16.48	0.00	9.42	0.00	15.87	0.00	7.32	0.00	1.92	0.00	75.22	0.00	9.49	0.00	2.71	0.00	2.41	0.00	1.79
inflow phos conc	ppb	381.54	449.59	381.54	403.09	381.54	449.68	381.54	395.34	381.54	348.86	381.54	397.25	381.54	448.28	381.54	443.59	381.54	416.67	381.54	397.79	381.54	401.42	381.54	407.14	381.54	338.04
outflow phos conc	ppb	381.54	285.66	381.54	187.58	381.54	222.70	381.54	277.11	381.54	282.91	381.54	397.23	381.54	349.68	381.54	295.80	381.54	416.67	381.54	349.46	381.54	181.58	381.54	229.28	381.54	265.77
p reaction rate	-	1.63	0.90	1.63	2.47	1.63	2.06	1.63	0.61	1.63	0.29	1.63	0.00	1.63	0.36	1.63	0.75	1.63	0.00	1.63	0.16	1.63	2.68	1.63	1.38	1.63	0.35
1-rp	-	1.00	0.64	1.00	0.47	1.00	0.50	1.00	0.70	1.00	0.81	1.00	1.00	1.00	0.78	1.00	0.67	1.00	1.00	1.00	0.88	1.00	0.45	1.00	0.56	1.00	0.79
runoff total p calc	ppb	0.00	449.01	0.00	450.00	0.00	449.74	0.00	408.39	0.00	449.75	0.00	449.82	0.00	449.11	0.00	441.29	0.00	416.49	0.00	387.34	0.00	372.38	0.00	372.96	0.00	301.02

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-17	WVR-17	Future WVR-170	WVR-170	Future WVR-171	WVR-171	Future WVR-172	WVR-172	Future WVR-18	WVR-18	Future WVR-19	WVR-19	Future WVR-190	WVR-190	Future WVR-191	WVR-191	Future WVR-20	WVR-20	Future WVR-201	WVR-201	Future WVR-202	WVR-202	Future WVR-21	WVR-21	Future WVR-22	WVR-22
		WVR-17	WVR-29	WVR-170	WVR-LL	WVR-171	WVR-17	WVR-172	WVR-171	WVR-18	WVR-17	WVR-19	WVR-21	WVR-190	WVR-LL	WVR-191	WVR-19	WVR-20	WVR-22	WVR-201	WVR-LL	WVR-202	WVR-LL	WVR-21	WVR-22	WVR-22	WVR-23
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	206.2	0.00	2.0	0.00	2.5	0.00	3.7	0.00	20.7	0.00	57.0	0.00	13.7	0.00	19.8	0.00	9.4	0.00	13.7	0.00	3.7	0.00	25.0	0.00	70.6
Total watershed area (w/o wat	acres	0.00	202.2	0.00	1.9	0.00	2.2	0.00	3.7	0.00	20.2	0.00	56.8	0.00	13.6	0.00	19.8	0.00	9.4	0.00	13.6	0.00	3.7	0.00	24.8	0.00	69.4
basin area	acres	0.00	3.98	0.00	0.11	0.00	0.27	0.00	0.00	0.00	0.53	0.00	0.18	0.00	0.10	0.00	0.03	0.00	0.00	0.00	0.07	0.00	0.04	0.00	0.20	0.00	1.27
basin volume	acre-ft	0.00	11.94	0.00	0.05	0.00	0.21	0.00	0.00	0.00	0.65	0.00	0.11	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.13	0.00	2.77
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	64%	0%	0%	0%	63%	0%	74%	0%	89%	0%	81%	0%	100%	0%	86%	0%	100%	0%	100%	0%	100%	0%	100%	0%	92%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	17%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	1%	0%	99%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Open Space		0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	16%	0%	0%	0%	37%	0%	26%	0%	11%	0%	19%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	562.96	0.00	1.88	0.00	5.90	0.00	3.69	0.00	20.21	0.00	117.12	0.00	13.58	0.00	19.76	0.00	9.45	0.00	13.61	0.00	3.69	0.00	141.88	0.00	220.70
tributary water area	ac	0.00	28.85	0.00	0.11	0.00	0.27	0.00	0.00	0.00	0.53	0.00	0.52	0.00	0.10	0.00	0.03	0.00	0.00	0.00	0.07	0.00	0.04	0.00	0.72	0.00	1.99
direct and ponded area	ac	0.00	591.81	0.00	1.99	0.00	6.17	0.00	3.69	0.00	20.74	0.00	117.64	0.00	13.68	0.00	19.80	0.00	9.45	0.00	13.68	0.00	3.73	0.00	142.60	0.00	222.69
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	387.64	0.00	251.14	0.00	394.61	0.00	393.67	0.00	392.43	0.00	393.12	0.00	391.50	0.00	392.66	0.00	391.50	0.00	391.50	0.00	391.50	0.00	391.50	0.00	387.27
runoff ortho p/total p	-	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	8.92	0.00	3.34	0.00	8.22	0.00	7.98	0.00	7.68	0.00	7.85	0.00	7.45	0.00	7.73	0.00	7.45	0.00	7.45	0.00	7.45	0.00	7.45	0.00	7.40
unit export	lbs/ac-y	0.00	0.79	0.00	0.19	0.00	0.74	0.00	0.71	0.00	0.68	0.00	0.70	0.00	0.66	0.00	0.69	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.66	0.00	0.65
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	150.35	0.00	0.52	0.00	1.51	0.00	2.46	0.00	12.93	0.00	37.13	0.00	8.42	0.00	12.74	0.00	5.86	0.00	8.44	0.00	2.29	0.00	15.36	0.00	42.78
upstream pond	ac-ft/yr	0.00	234.09	0.00	0.00	0.00	2.46	0.00	0.00	0.00	0.00	0.00	38.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.46	0.00	96.69
total inflow	**ac-ft/yr**	**0.00**	**384.45**	**0.00**	**0.52**	**0.00**	**3.97**	**0.00**	**2.46**	**0.00**	**12.93**	**0.00**	**75.46**	**0.00**	**8.42**	**0.00**	**12.74**	**0.00**	**5.86**	**0.00**	**8.44**	**0.00**	**2.29**	**0.00**	**90.83**	**0.00**	**139.47**
outflow	ac-ft/yr	0.00	384.45	0.00	0.52	0.00	3.97	0.00	2.46	0.00	12.93	0.00	75.46	0.00	8.42	0.00	12.74	0.00	5.86	0.00	8.44	0.00	2.29	0.00	90.83	0.00	139.47
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	159.99	0.00	0.36	0.00	1.62	0.00	2.63	0.00	13.80	0.00	39.71	0.00	8.96	0.00	13.60	0.00	6.24	0.00	8.99	0.00	2.44	0.00	16.35	0.00	45.34
upstream pond	lbs/yr	0.00	156.98	0.00	0.00	0.00	2.63	0.00	0.00	0.00	0.00	0.00	33.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.43	0.00	84.12
total inflow	**lbs/yr**	**0.00**	**316.97**	**0.00**	**0.36**	**0.00**	**4.25**	**0.00**	**2.63**	**0.00**	**13.80**	**0.00**	**72.86**	**0.00**	**8.96**	**0.00**	**13.60**	**0.00**	**6.24**	**0.00**	**8.99**	**0.00**	**2.44**	**0.00**	**83.78**	**0.00**	**129.46**
net sedimentation	lbs/yr	0.00	130.34	0.00	0.09	0.00	1.63	0.00	0.00	0.00	5.94	0.00	5.43	0.00	1.49	0.00	0.40	0.00	0.00	0.00	1.03	0.00	0.29	0.00	5.90	0.00	47.28
outflow	lbs/yr	0.00	186.63	0.00	0.27	0.00	2.63	0.00	2.63	0.00	7.86	0.00	67.43	0.00	7.47	0.00	13.21	0.00	6.24	0.00	7.96	0.00	2.15	0.00	77.88	0.00	82.18
p removal efficiency	%	100.00	41.12	100.00	24.72	100.00	38.19	100.00	0.03	100.00	43.05	100.00	7.45	100.00	16.64	100.00	2.92	100.00	0.01	100.00	11.43	100.00	11.96	100.00	7.05	100.00	36.52
upstream w-shed p load	lbs/yr	0.00	404.07	0.00	0.36	0.00	4.26	0.00	2.63	0.00	13.80	0.00	80.59	0.00	8.96	0.00	13.60	0.00	6.24	0.00	8.99	0.00	2.44	0.00	96.94	0.00	148.53
total removal %	%	100.00	53.81	100.00	24.72	100.00	38.20	100.00	0.03	100.00	43.05	100.00	16.33	100.00	16.64	100.00	2.92	100.00	0.01	100.00	11.43	100.00	11.96	100.00	19.67	100.00	44.67
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	3.00	1.00	0.44	1.00	0.79	1.00	0.10	1.00	1.23	1.00	0.61	1.00	0.42	1.00	0.19	1.00	0.10	1.00	0.33	1.00	0.22	1.00	0.65	1.00	2.18
relative volume	inches	0.00	2.75	0.00	3.26	0.00	4.89	0.00	0.00	0.00	1.75	0.00	0.10	0.00	0.17	0.00	0.02	0.00	0.00	0.00	0.09	0.00	0.13	0.00	0.29	0.00	2.24
residence time	years	87585.71	0.03	87585.71	0.09	87585.71	0.05	87585.71	0.00	87585.71	0.05	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.02
residence time	days	31968784.45	11.34	31968784.45	34.38	31968784.45	19.67	31968784.45	0.00	31968784.45	18.43	31968784.45	0.53	31968784.45	1.82	31968784.45	0.17	31968784.45	0.00	31968784.45	0.99	31968784.45	1.33	31968784.45	0.51	31968784.45	7.25
overflow rate	ft/yr	0.00	96.57	0.00	4.70	0.00	14.70	0.00	24565.33	0.00	24.39	0.00	419.23	0.00	83.41	0.00	410.86	0.00	58631.92	0.00	120.63	0.00	60.31	0.00	458.72	0.00	109.82
inflow phos conc	ppb	366.44	303.34	366.44	255.05	366.44	394.43	366.44	394.12	366.44	392.68	366.44	355.25	366.44	391.52	366.44	392.95	366.44	391.52	366.44	391.52	366.44	391.52	366.44	339.38	366.44	341.52
outflow phos conc	ppb	366.44	178.60	366.44	192.01	366.44	243.79	366.44	394.00	366.44	223.64	366.44	328.77	366.44	326.38	366.44	381.47	366.44	391.47	366.44	346.78	366.44	344.68	366.44	315.47	366.44	216.79
p reaction rate	-	1.57	1.19	1.57	0.44	1.57	1.00	1.57	0.00	1.57	1.33	1.57	0.09	1.57	0.24	1.57	0.03	1.57	0.00	1.57	0.15	1.57	0.15	1.57	0.08	1.57	0.91
1-rp	-	1.00	0.59	1.00	0.75	1.00	0.62	1.00	1.00	1.00	0.57	1.00	0.93	1.00	0.83	1.00	0.97	1.00	1.00	1.00	0.89	1.00	0.88	1.00	0.93	1.00	0.63
vlawmo pond volume	acre-ft	0.00	10.86	0.00	0.04	0.00	0.11	0.00	0.18	0.00	0.93	0.00	2.68	0.00	0.61	0.00	0.92	0.00	0.42	0.00	0.61	0.00	0.17	0.00	1.11	0.00	3.09
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	387.64	0.00	251.14	0.00	394.61	0.00	393.67	0.00	392.43	0.00	393.12	0.00	391.50	0.00	392.66	0.00	391.50	0.00	391.50	0.00	391.50	0.00	391.50	0.00	387.27
runoff coefficient		0.00	0.26	0.00	0.10	0.00	0.24	0.00	0.23	0.00	0.22	0.00	0.23	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.22	0.00	0.21
dissolved/total P		0.00	0.31	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	142.10	0.00	215.39	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	142.47
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	57242.88	0.00	301.54	0.00	573.82	0.00	932.01	0.00	4904.84	0.00	14087.52	0.00	3196.17	0.00	4832.30	0.00	2224.50	0.00	3203.70	0.00	869.53	0.00	5829.11	0.00	16356.25
upstream pond	lbs/yr	0.00	38229.26	0.00	0.00	0.00	932.01	0.00	0.00	0.00	0.00	0.00	8737.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18789.72	0.00	22974.66
total inflow	**lbs/yr**	**0.00**	**95472.13**	**0.00**	**301.54**	**0.00**	**1505.83**	**0.00**	**932.01**	**0.00**	**4904.84**	**0.00**	**22824.82**	**0.00**	**3196.17**	**0.00**	**4832.30**	**0.00**	**2224.50**	**0.00**	**3203.70**	**0.00**	**869.53**	**0.00**	**24618.83**	**0.00**	**39330.91**
p removal efficiency (no inf)	%	0.00	43.00	0.00	25.00	0.00	40.00	0.00	0.00	0.00	46.00	0.00	9.00	0.00	19.00	0.00	4.00	0.00	0.00	0.00	13.00	0.00	14.00	0.00	8.00	0.00	39.00
tss removal efficiency (no inf)	%	0.00	68.67	0.00	49.11	0.00	66.00	0.00	0.00	0.00	72.00	0.00	17.68	0.00	37.32	0.00	7.86	0.00	0.00	0.00	25.54	0.00	27.50	0.00	15.71	0.00	65.00
net sedimentation	lbs/yr	0.00	65557.53	0.00	148.08	0.00	993.85	0.00	0.00	0.00	3531.49	0.00	4035.10	0.00	1192.85	0.00	379.68	0.00	0.00	0.00	818.09	0.00	239.12	0.00	3868.67	0.00	25565.09
outflow	lbs/yr	0.00	29914.60	0.00	153.46	0.00	511.98	0.00	932.01	0.00	1373.36	0.00	18789.72	0.00	2003.31	0.00	4452.62	0.00	2224.50	0.00	2385.61	0.00	630.41	0.00	20750.16	0.00	13765.82
tss removal efficiency (inf)	%	100.00	68.67	100.00	49.11	100.00	66.00	100.00	0.00	100.00	72.00	100.00	17.68	100.00	37.32	100.00	7.86	100.00	0.00	100.00	25.54	100.00	27.50	100.00	15.71	100.00	65.00
upstream watershed tss load	lbs/yr	0.00	148472.38	0.00	301.54	0.00	1505.83	0.00	932.01	0.00	4904.84	0.00	28630.15	0.00	3196.17	0.00	4832.30	0.00	2224.50	0.00	3203.70	0.00	869.53	0.00	34459.26	0.00	53040.01
tss total removal efficiency	%	100.00	79.85	100.00	49.11	100.00	66.00	100.00	0.00	100.00	72.00	100.00	34.37	100.00	37.32	100.00	7.86	100.00	0.00	100.00	25.54	100.00	27.50	100.00	39.78	100.00	74.05
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**384.45**	**0.00**	**0.52**	**0.00**	**3.97**	**0.00**	**2.46**	**0.00**	**12.93**	**0.00**	**75.46**	**0.00**	**8.42**	**0.00**	**12.74**	**0.00**	**5.86**	**0.00**	**8.44**	**0.00**	**2.29**	**0.00**	**90.83**	**0.00**	**139.47**
Adjusted TP outflow	**lbs/yr**	**0.00**	**186.63**	**0.00**	**0.27**	**0.00**	**2.63**	**0.00**	**2.63**	**0.00**	**7.86**	**0.00**	**67.43**	**0.00**	**7.47**	**0.00**	**13.21**	**0.00**	**6.24**	**0.00**	**7.96**	**0.00**	**2.15**	**0.00**	**77.88**	**0.00**	**82.18**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**29914.60**	**0.00**	**153.46**	**0.00**	**511.98**	**0.00**	**932.01**	**0.00**	**1373.36**	**0.00**	**18789.72**	**0.00**	**2003.31**	**0.00**	**4452.62**	**0.00**	**2224.50**	**0.00**	**2385.61**	**0.00**	**630.41**	**0.00**	**20750.16**	**0.00**	**13765.82**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	179.47	0.00	0.36	0.00	1.76	0.00	2.90	0.00	15.57	0.00	44.24	0.00	10.30	0.00	15.29	0.00	7.17	0.00	10.33	0.00	2.80	0.00	18.79	0.00	51.68
Adjusted TP outflow	**lbs/yr**	**0.00**	**199.49**	**0.00**	**0.27**	**0.00**	**2.81**	**0.00**	**2.90**	**0.00**	**8.55**	**0.00**	**74.48**	**0.00**	**8.41**	**0.00**	**14.79**	**0.00**	**7.17**	**0.00**	**9.01**	**0.00**	**2.43**	**0.00**	**86.06**	**0.00**	**89.20**
upstream pond	lbs/yr	0.00	168.95	0.00	0.00	0.00	2.90	0.00	0.00	0.00	0.00	0.00	36.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.48	0.00	93.23
total inflow	**lbs/yr**	**0.00**	**348.42**	**0.00**	**0.36**	**0.00**	**4.66**	**0.00**	**2.90**	**0.00**	**15.57**	**0.00**	**81.10**	**0.00**	**10.30**	**0.00**	**15.29**	**0.00**	**7.17**	**0.00**	**10.33**	**0.00**	**2.80**	**0.00**	**93.27**	**0.00**	**144.91**
outflow	lbs/yr	0.00	199.49	0.00	0.27	0.00	2.81	0.00	2.90	0.00	8.55	0.00	74.48	0.00	8.41	0.00	14.79	0.00	7.17	0.00	9.01	0.00	2.43	0.00	86.06	0.00	89.20
inflow phos conc	ppb	381.54	333.44	381.54	257.13	381.54	432.37	381.54	434.73	381.54	443.20	381.54	395.43	381.54	450.02	381.54	441.61	381.54	450.02	381.54	450.02	381.54	450.02	381.54	377.83	381.54	382.27
outflow phos conc	ppb	381.54	190.91	381.54	193.26	381.54	260.44	381.54	434.59	381.54	243.24	381.54	363.13	381.54	367.45	381.54	427.21	381.54	449.96	381.54	392.66	381.54	390.04	381.54	348.63	381.54	235.31
p reaction rate	-	1.63	1.30	1.63	0.44	1.63	1.10	1.63	0.00	1.63	1.50	1.63	0.10	1.63	0.28	1.63	0.03	1.63	0.00	1.63	0.17	1.63	0.18	1.63	0.09	1.63	1.01
1-rp	-	1.00	0.57	1.00	0.75	1.00	0.60	1.00	1.00	1.00	0.55	1.00	0.92	1.00	0.82	1.00	0.97	1.00	1.00	1.00	0.87	1.00	0.87	1.00	0.92	1.00	0.62
runoff total p calc	ppb	0.00	434.90	0.00	251.61	0.00	431.71	0.00	437.21	0.00	444.52	0.00	440.45	0.00	450.00	0.00	443.18	0.00	450.00	0.00	450.00	0.00	450.00	0.00	450.00	0.00	441.37

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-23	WVR-23	Future WVR-230	WVR-230	Future WVR-231	WVR-231	Future WVR-24	WVR-24	Future WVR-25	WVR-25	Future WVR-26	WVR-26	Future WVR-27	WVR-27	Future WVR-28	WVR-28	Future WVR-280	WVR-280	Future WVR-281	WVR-281	Future WVR-29	WVR-29	Future WVR-290	WVR-290	Future WVR-291	WVR-291
		WVR-23	WVR-231	WVR-230	WVR-23	WVR-231	WVR-26	WVR-24	WVR-26	WVR-25	WVR-26	WVR-26	WVR-28	WVR-27	WVR-28	WVR-28	WVR-443	WVR-280	WVR-28	WVR-281	WVR-280	WVR-29	WVR-33	WVR-290	WVR-29	WVR-291	WVR-29
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		1.95	146.4	0.00	10.8	0.00	16.4	0.00	24.7	0.00	11.1	1.21	169.4	0.00	56.2	23.79	523.2	0.20	160.8	0.00	21.1	0.00	52.9	0.00	8.4	0.00	4.7
Total watershed area (w/o wat	acres	1.95	146.2	0.00	10.8	0.00	15.3	0.00	24.7	0.00	11.1	1.21	167.9	0.00	54.5	23.79	516.5	0.20	154.2	0.00	21.0	0.00	51.8	0.00	8.4	0.00	4.7
basin area	acres	0.00	0.12	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	1.50	0.00	1.66	0.00	6.75	0.00	6.51	0.00	0.14	0.00	1.15	0.00	0.00	0.00	0.00
basin volume	acre-ft	0.00	0.05	0.00	0.00	0.00	2.24	0.00	0.00	0.00	0.00	0.00	9.77	0.00	5.17	0.00	22.84	0.00	23.77	0.00	0.07	0.00	2.35	0.00	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	70%	0%	95%	0%	42%	0%	100%	0%	10%	0%	53%	0%	39%	0%	28%	100%	88%	0%	98%	0%	19%	0%	46%	0%	48%
Medium Density Residential		100%	4%	0%	0%	0%	0%	0%	0%	0%	51%	100%	15%	0%	7%	0%	2%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%
High Density Residential		0%	13%	0%	0%	0%	16%	0%	0%	0%	0%	0%	6%	0%	0%	0%	4%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	9%	0%	50%	32%	48%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	68%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	3%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	5%	0%	0%	0%	2%	0%	6%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	34%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	13%	0%	5%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	9%	0%	0%	0%	1%	0%	56%	0%	54%	0%	52%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	1.95	379.68	0.00	10.78	0.00	395.01	0.00	24.68	0.00	11.07	1.21	599.87	0.00	874.40	23.79	3577.14	0.20	645.29	0.00	20.99	0.00	627.82	0.00	8.37	0.00	4.73
tributary water area	ac	0.00	2.11	0.00	0.00	0.00	3.22	0.00	0.00	0.00	0.00	0.00	4.72	0.00	58.51	0.00	121.26	0.00	16.84	0.00	0.14	0.00	30.00	0.00	0.00	0.00	0.00
direct and ponded area	ac	1.95	381.79	0.00	10.78	0.00	398.23	0.00	24.68	0.00	11.07	1.21	604.59	0.00	932.91	23.79	3698.40	0.20	662.13	0.00	21.12	0.00	657.82	0.00	8.37	0.00	4.73
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	391.50	392.61	0.00	391.88	0.00	314.80	0.00	391.50	0.00	375.00	391.50	380.47	0.00	362.85	350.00	366.66	391.50	382.20	0.00	389.50	0.00	396.27	0.00	396.09	0.00	395.89
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.40	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	10.60	8.79	0.00	7.54	0.00	6.34	0.00	7.45	0.00	11.49	10.60	9.12	0.00	11.09	16.93	11.74	7.45	7.63	0.00	7.41	0.00	9.41	0.00	8.58	0.00	8.53
unit export	lbs/ac-y	0.94	0.78	0.00	0.67	0.00	0.53	0.00	0.66	0.00	0.97	0.94	0.79	0.00	0.91	1.34	0.97	0.66	0.67	0.00	0.66	0.00	0.85	0.00	0.77	0.00	0.77
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	1.72	107.13	0.00	6.78	0.00	8.09	0.00	15.32	0.00	10.59	1.07	127.59	0.00	50.37	33.57	505.48	0.12	98.10	0.00	12.97	0.00	40.60	0.00	5.99	0.00	3.36
upstream pond	ac-ft/yr	0.00	146.53	0.00	0.00	0.00	253.65	0.00	0.00	0.00	0.00	0.00	287.95	0.00	534.15	0.00	2090.27	0.00	370.30	0.00	0.00	0.00	393.80	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**1.72**	**253.65**	**0.00**	**6.78**	**0.00**	**261.75**	**0.00**	**15.32**	**0.00**	**10.59**	**1.07**	**415.53**	**0.00**	**584.52**	**33.57**	**2595.75**	**0.12**	**468.40**	**0.00**	**12.97**	**0.00**	**434.39**	**0.00**	**5.99**	**0.00**	**3.36**
outflow	ac-ft/yr	0.28	253.65	0.00	6.78	0.00	261.75	0.00	15.32	0.00	10.59	0.29	415.53	0.00	584.52	3.50	2595.75	0.12	468.40	0.00	12.97	0.00	434.39	0.00	5.99	0.00	3.36
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	1.84	114.35	0.00	7.22	0.00	8.09	0.00	16.30	0.00	10.71	1.14	132.55	0.00	49.67	31.94	499.52	0.13	102.86	0.00	13.78	0.00	43.73	0.00	6.45	0.00	3.63
upstream pond	lbs/yr	0.00	89.55	0.00	0.00	0.00	201.62	0.00	0.00	0.00	0.00	0.00	196.52	0.00	257.09	0.00	850.26	0.00	123.34	0.00	0.00	0.00	196.70	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**1.84**	**203.91**	**0.00**	**7.22**	**0.00**	**209.72**	**0.00**	**16.30**	**0.00**	**10.71**	**1.14**	**329.07**	**0.00**	**306.76**	**31.94**	**1349.77**	**0.13**	**226.21**	**0.00**	**13.78**	**0.00**	**240.43**	**0.00**	**6.45**	**0.00**	**3.63**
net sedimentation	lbs/yr	1.68	2.28	0.00	0.00	0.00	40.39	0.00	0.00	0.00	0.00	0.95	131.30	0.00	55.86	30.01	251.89	0.00	88.21	0.00	2.48	0.00	33.01	0.00	0.00	0.00	0.00
outflow	lbs/yr	0.15	201.62	0.00	7.22	0.00	169.33	0.00	16.30	0.00	10.71	0.18	197.76	0.00	250.90	1.92	1097.88	0.13	138.00	0.00	11.30	0.00	207.43	0.00	6.45	0.00	3.62
p removal efficiency	%	91.68	1.12	100.00	0.01	100.00	19.26	100.00	0.00	100.00	0.01	83.99	39.90	100.00	18.21	93.98	18.66	0.00	39.00	100.00	18.02	100.00	13.73	100.00	0.01	100.00	0.02
upstream w-shed p load	lbs/yr	1.84	271.94	0.00	7.22	0.00	280.03	0.00	16.30	0.00	10.71	1.14	440.72	0.00	598.94	31.94	2753.65	0.13	534.17	0.00	13.78	0.00	457.88	0.00	6.45	0.00	3.63
total removal %	%	91.68	25.86	100.00	0.01	100.00	39.53	100.00	0.00	100.00	0.01	83.99	55.13	100.00	58.11	93.98	60.13	0.00	74.17	100.00	18.02	100.00	54.70	100.00	0.01	100.00	0.02
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	0.46	1.00	0.10	1.00	2.00	1.00	0.10	1.00	0.10	1.00	6.51	1.00	3.11	1.00	3.38	1.00	3.65	1.00	0.51	1.00	2.04	1.00	0.10	1.00	0.10
relative volume	inches	0.00	0.02	0.00	0.00	0.00	9.57	0.00	0.00	0.00	0.00	0.00	2.65	0.00	3.55	0.00	1.56	0.00	8.39	0.00	0.19	0.00	2.00	0.00	0.00	0.00	0.00
residence time	years	0.00	0.00	87585.71	0.00	87585.71	0.01	87585.71	0.00	87585.71	0.00	0.00	0.02	87585.71	0.01	0.00	0.01	0.00	0.05	87585.71	0.01	87585.71	0.01	87585.71	0.00	87585.71	0.00
residence time	days	0.00	0.08	31968784.45	0.00	31968784.45	3.12	31968784.45	0.00	31968784.45	0.00	0.00	8.58	31968784.45	3.23	0.00	3.21	0.00	18.52	31968784.45	1.98	31968784.45	1.98	31968784.45	0.00	31968784.45	0.00
overflow rate	ft/yr	281720.25	2167.99	0.00	67764.74	0.00	234.54	0.00	153168.56	0.00	105932.43	293164.47	277.02	0.00	352.12	3501304.12	384.56	124112.92	71.95	0.00	93.95	0.00	377.73	0.00	59855.82	0.00	33644.23
inflow phos conc	ppb	391.52	295.76	366.44	392.01	366.44	294.78	366.44	391.52	366.44	371.98	391.52	291.36	366.44	193.08	350.02	191.31	391.52	177.68	366.44	390.98	366.44	203.64	366.44	396.63	366.44	396.43
outflow phos conc	ppb	391.52	292.45	366.44	391.97	366.44	238.01	366.44	391.50	366.44	371.96	391.52	175.10	366.44	157.92	350.02	155.61	391.52	108.39	366.44	320.54	366.44	175.69	366.44	396.58	366.44	396.34
p reaction rate	-	0.00	0.01	1.57	0.00	1.57	0.30	1.57	0.00	1.57	0.00	0.00	1.10	1.57	0.27	0.00	0.28	0.00	1.05	1.57	0.27	1.57	0.18	1.57	0.00	1.57	0.00
1-rp	-	1.00	0.99	1.00	1.00	1.00	0.81	1.00	1.00	1.00	1.00	1.00	0.60	1.00	0.82	1.00	0.81	1.00	0.61	1.00	0.82	1.00	0.86	1.00	1.00	1.00	1.00
vlawmo pond volume	acre-ft	0.12	7.74	0.00	0.49	0.00	0.58	0.00	1.11	0.00	0.76	0.08	9.21	0.00	3.64	2.42	36.50	0.01	7.08	0.00	0.94	0.00	2.93	0.00	0.43	0.00	0.24
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	391.50	392.61	0.00	391.88	0.00	314.80	0.00	391.50	0.00	375.00	391.50	380.47	0.00	362.85	350.00	366.66	391.50	382.20	0.00	389.50	0.00	396.27	0.00	396.09	0.00	395.89
runoff coefficient		0.31	0.25	0.00	0.22	0.00	0.18	0.00	0.22	0.00	0.33	0.31	0.26	0.00	0.32	0.49	0.34	0.22	0.22	0.00	0.21	0.00	0.27	0.00	0.25	0.00	0.25
dissolved/total P		0.30	0.30	0.00	0.30	0.00	0.40	0.00	0.30	0.00	0.30	0.30	0.30	0.00	0.31	0.30	0.30	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	140.00	140.00	0.00	140.00	0.00	172.00	0.00	140.00	0.00	140.00	140.00	143.68	0.00	143.19	140.00	141.64	140.00	144.36	0.00	140.78	0.00	140.00	0.00	140.00	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	654.46	40644.34	0.00	2571.00	0.00	3292.69	0.00	5811.22	0.00	4019.08	405.14	48858.63	0.00	19179.19	12736.76	192392.81	47.09	37711.96	0.00	4925.39	0.00	15402.09	0.00	2270.93	0.00	1276.47
upstream pond	lbs/yr	0.00	16501.72	0.00	0.00	0.00	54901.04	0.00	0.00	0.00	0.00	0.00	44179.03	0.00	48942.89	0.00	128591.80	0.00	9406.12	0.00	0.00	0.00	33462.00	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**654.46**	**57146.07**	**0.00**	**2571.00**	**0.00**	**58193.73**	**0.00**	**5811.22**	**0.00**	**4019.08**	**405.14**	**93037.67**	**0.00**	**68122.08**	**12736.76**	**320984.61**	**47.09**	**47118.08**	**0.00**	**4925.39**	**0.00**	**48864.09**	**0.00**	**2270.93**	**0.00**	**1276.47**
p removal efficiency (no inf)	%	0.00	2.00	0.00	0.00	0.00	21.00	0.00	0.00	0.00	0.00	0.00	42.00	0.00	19.00	0.00	20.00	0.00	41.00	0.00	20.00	0.00	15.00	0.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	0.00	3.93	0.00	0.00	0.00	41.25	0.00	0.00	0.00	0.00	0.00	68.00	0.00	37.32	0.00	39.29	0.00	67.00	0.00	39.29	0.00	29.46	0.00	0.00	0.00	0.00
net sedimentation	lbs/yr	0.00	2245.02	0.00	0.00	0.00	24004.91	0.00	0.00	0.00	0.00	0.00	63265.61	0.00	25424.13	0.00	126101.10	0.00	31569.12	0.00	1934.98	0.00	14397.46	0.00	0.00	0.00	0.00
outflow	lbs/yr	164.91	54901.04	0.00	2571.00	0.00	34188.82	0.00	5811.22	0.00	4019.08	159.92	29772.05	0.00	42697.95	2043.68	194883.51	47.09	15548.97	0.00	2990.42	0.00	34466.64	0.00	2270.93	0.00	1276.47
tss removal efficiency (inf)	%	74.80	3.93	100.00	0.00	100.00	41.25	100.00	0.00	100.00	0.00	60.53	68.00	100.00	37.32	83.95	39.29	0.00	67.00	100.00	39.29	100.00	29.46	100.00	0.00	100.00	0.00
upstream watershed tss load	lbs/yr	654.46	96909.81	0.00	2571.00	0.00	100202.49	0.00	5811.22	0.00	4019.08	405.14	159296.56	0.00	226933.92	12736.76	1045209.79	47.09	215483.51	0.00	4925.39	0.00	167421.87	0.00	2270.93	0.00	1276.47
tss total removal efficiency	%	74.80	43.35	100.00	0.00	100.00	65.88	100.00	0.00	100.00	0.00	60.53	81.31	100.00	81.18	83.95	81.35	0.00	92.78	100.00	39.29	100.00	79.41	100.00	0.00	100.00	0.00
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.28**	**253.65**	**0.00**	**6.78**	**0.00**	**261.75**	**0.00**	**15.32**	**0.00**	**10.59**	**0.29**	**415.53**	**0.00**	**584.52**	**3.50**	**2595.75**	**0.12**	**468.40**	**0.00**	**12.97**	**0.00**	**434.39**	**0.00**	**5.99**	**0.00**	**3.36**
Adjusted TP outflow	**lbs/yr**	**0.15**	**201.62**	**0.00**	**7.22**	**0.00**	**169.33**	**0.00**	**16.30**	**0.00**	**10.71**	**0.18**	**197.76**	**0.00**	**250.90**	**1.92**	**1097.88**	**0.13**	**138.00**	**0.00**	**11.30**	**0.00**	**207.43**	**0.00**	**6.45**	**0.00**	**3.62**
Adjusted TSS outflow	**lbs/yr**	**164.91**	**54901.04**	**0.00**	**2571.00**	**0.00**	**34188.82**	**0.00**	**5811.22**	**0.00**	**4019.08**	**159.92**	**29772.05**	**0.00**	**42697.95**	**2043.68**	**194883.51**	**47.09**	**15548.97**	**0.00**	**2990.42**	**0.00**	**34466.64**	**0.00**	**2270.93**	**0.00**	**1276.47**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	2.11	128.96	0.00	8.24	0.00	9.20	0.00	18.74	0.00	11.60	1.31	146.63	0.00	52.31	31.94	519.48	0.15	117.19	0.00	15.81	0.00	46.50	0.00	6.83	0.00	3.85
Adjusted TP outflow	**lbs/yr**	**2.11**	**225.65**	**0.00**	**8.23**	**0.00**	**186.08**	**0.00**	**18.73**	**0.00**	**11.60**	**1.31**	**212.60**	**0.00**	**263.55**	**31.94**	**1170.11**	**0.15**	**149.81**	**0.00**	**12.68**	**0.00**	**219.65**	**0.00**	**6.83**	**0.00**	**3.85**
upstream pond	lbs/yr	0.00	99.55	0.00	0.00	0.00	225.65	0.00	0.00	0.00	0.00	0.00	217.72	0.00	272.88	0.00	936.74	0.00	136.58	0.00	0.00	0.00	210.17	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**2.11**	**228.51**	**0.00**	**8.24**	**0.00**	**234.86**	**0.00**	**18.74**	**0.00**	**11.60**	**1.31**	**364.35**	**0.00**	**325.19**	**31.94**	**1456.23**	**0.15**	**253.77**	**0.00**	**15.81**	**0.00**	**256.66**	**0.00**	**6.83**	**0.00**	**3.85**
outflow	lbs/yr	2.11	225.65	0.00	8.23	0.00	186.08	0.00	18.73	0.00	11.60	1.31	212.60	0.00	263.55	31.94	1170.11	0.15	149.81	0.00	12.68	0.00	219.65	0.00	6.83	0.00	3.85
inflow phos conc	ppb	450.02	331.44	381.54	447.16	381.54	330.12	381.54	450.02	381.54	402.94	450.02	322.60	381.54	204.69	350.02	206.40	450.02	199.33	381.54	448.57	381.54	217.39	381.54	419.98	381.54	421.13
outflow phos conc	ppb	450.02	327.30	381.54	447.10	381.54	261.56	381.54	450.00	381.54	402.91	450.02	188.24	381.54	165.89	350.02	165.85	450.02	117.67	381.54	359.81	381.54	186.04	381.54	419.93	381.54	421.03
p reaction rate	-	0.00	0.01	1.63	0.00	1.63	0.33	1.63	0.00	1.63	0.00	0.00	1.22	1.63	0.29	0.00	0.30	0.00	1.18	1.63	0.31	1.63	0.20	1.63	0.00	1.63	0.00
1-rp	-	1.00	0.99	1.00	1.00	1.00	0.79	1.00	1.00	1.00	1.00	1.00	0.58	1.00	0.81	1.00	0.80	1.00	0.59	1.00	0.80	1.00	0.86	1.00	1.00	1.00	1.00
runoff total p calc	ppb	450.00	443.44	0.00	447.74	0.00	348.67	0.00	450.00	0.00	410.25	450.00	423.36	0.00	389.84	350.00	386.56	450.00	435.60	0.00	446.83	0.00	421.78	0.00	423.00	0.00	424.18

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-292	WVR-292	Future WVR-30	WVR-30	Future WVR-31	WVR-31	Future WVR-32	WVR-32	Future WVR-320	WVR-320	Future WVR-321	WVR-321	Future WVR-322	WVR-322	Future WVR-33	WVR-33	Future WVR-34	WVR-34	Future WVR-35	WVR-35	Future WVR-36	WVR-36	Future WVR-37	WVR-37	Future WVR-370	WVR-370
		WVR-292	WVR-LL	WVR-30	WVR-17	WVR-31	WVR-33	WVR-32	WVR-321	WVR-320	WVR-321	WVR-321	WVR-280	WVR-322	WVR-280	WVR-33	WVR-36	WVR-34	WVR-36	WVR-35	WVR-36	WVR-36	WVR-28	WVR-37	WVR-38	WVR-370	WVR-LL
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	4.1	0.00	16.9	0.00	23.7	0.00	4.6	0.00	5.1	0.00	64.6	0.00	3.7	0.00	63.7	0.00	2.6	0.00	17.4	0.00	186.5	0.00	12.3	0.00	3.2
Total watershed area (w/o wat	acres	0.00	4.0	0.00	15.9	0.00	23.1	0.00	4.6	0.00	4.5	0.00	61.6	0.00	3.6	0.00	62.7	0.00	2.6	0.00	17.4	0.00	183.7	0.00	12.3	0.00	3.2
basin area	acres	0.00	0.10	0.00	1.00	0.00	0.64	0.00	0.00	0.00	0.52	0.00	3.00	0.00	0.13	0.00	0.96	0.00	0.08	0.00	0.00	0.00	2.77	0.00	0.00	0.00	0.00
basin volume	acre-ft	0.00	0.04	0.00	1.87	0.00	0.89	0.00	0.00	0.00	2.13	0.00	18.57	0.00	0.06	0.00	1.74	0.00	0.00	0.00	0.00	0.00	10.05	0.00	0.00	0.00	0.00
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	93%	0%	84%	0%	45%	0%	100%	0%	100%	0%	85%	0%	98%	0%	84%	0%	100%	0%	100%	0%	80%	0%	82%	0%	100%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	2%	0%	55%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%
Open Space		0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	7%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%	4%	0%	18%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	4.03	0.00	15.92	0.00	23.06	0.00	4.65	0.00	4.54	0.00	70.77	0.00	3.57	0.00	713.59	0.00	2.57	0.00	17.42	0.00	917.32	0.00	12.31	0.00	3.21
tributary water area	ac	0.00	0.10	0.00	1.00	0.00	0.64	0.00	0.00	0.00	0.52	0.00	3.52	0.00	0.13	0.00	31.60	0.00	0.08	0.00	0.00	0.00	34.44	0.00	0.00	0.00	0.00
direct and ponded area	ac	0.00	4.13	0.00	16.92	0.00	23.70	0.00	4.65	0.00	5.06	0.00	74.29	0.00	3.70	0.00	745.19	0.00	2.65	0.00	17.42	0.00	951.76	0.00	12.31	0.00	3.21
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	392.10	0.00	371.51	0.00	368.61	0.00	391.50	0.00	391.50	0.00	363.01	0.00	391.63	0.00	385.42	0.00	391.50	0.00	391.50	0.00	373.73	0.00	393.07	0.00	391.50
runoff ortho p/total p	-	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.34	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.60	0.00	7.04	0.00	9.76	0.00	7.45	0.00	7.45	0.00	6.60	0.00	7.48	0.00	8.10	0.00	7.45	0.00	7.45	0.00	7.21	0.00	7.83	0.00	7.45
unit export	lbs/ac-y	0.00	0.67	0.00	0.62	0.00	0.81	0.00	0.66	0.00	0.66	0.00	0.57	0.00	0.66	0.00	0.70	0.00	0.66	0.00	0.66	0.00	0.62	0.00	0.70	0.00	0.66
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	2.55	0.00	9.34	0.00	18.76	0.00	2.88	0.00	2.82	0.00	33.89	0.00	2.23	0.00	42.35	0.00	1.59	0.00	10.81	0.00	110.40	0.00	8.04	0.00	1.99
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.70	0.00	0.00	0.00	453.16	0.00	0.00	0.00	0.00	0.00	507.91	0.00	0.00	0.00	0.00
total inflow	**ac-ft/yr**	**0.00**	**2.55**	**0.00**	**9.34**	**0.00**	**18.76**	**0.00**	**2.88**	**0.00**	**2.82**	**0.00**	**39.59**	**0.00**	**2.23**	**0.00**	**495.51**	**0.00**	**1.59**	**0.00**	**10.81**	**0.00**	**618.31**	**0.00**	**8.04**	**0.00**	**1.99**
outflow	ac-ft/yr	0.00	2.55	0.00	9.34	0.00	18.76	0.00	2.88	0.00	2.82	0.00	39.59	0.00	2.23	0.00	495.51	0.00	1.59	0.00	10.81	0.00	618.31	0.00	8.04	0.00	1.99
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	2.72	0.00	9.79	0.00	18.57	0.00	3.07	0.00	3.00	0.00	35.37	0.00	2.37	0.00	44.06	0.00	1.70	0.00	11.50	0.00	114.65	0.00	8.59	0.00	2.12
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.06	0.00	0.00	0.00	218.08	0.00	0.00	0.00	0.00	0.00	250.10	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**2.72**	**0.00**	**9.79**	**0.00**	**18.57**	**0.00**	**3.07**	**0.00**	**3.00**	**0.00**	**39.43**	**0.00**	**2.37**	**0.00**	**262.14**	**0.00**	**1.70**	**0.00**	**11.50**	**0.00**	**364.75**	**0.00**	**8.59**	**0.00**	**2.12**
net sedimentation	lbs/yr	0.00	0.67	0.00	5.12	0.00	7.93	0.00	0.00	0.00	2.00	0.00	26.70	0.00	0.70	0.00	25.24	0.00	0.00	0.00	0.00	0.00	103.07	0.00	0.00	0.00	0.00
outflow	lbs/yr	0.00	2.04	0.00	4.67	0.00	10.65	0.00	3.07	0.00	0.99	0.00	12.73	0.00	1.67	0.00	236.90	0.00	1.70	0.00	11.50	0.00	261.68	0.00	8.59	0.00	2.12
p removal efficiency	%	100.00	24.78	100.00	52.33	0.00	42.67	100.00	0.03	100.00	66.90	100.00	67.71	100.00	29.43	100.00	9.63	100.00	0.01	100.00	0.01	100.00	28.26	100.00	0.01	100.00	0.04
upstream w-shed p load	lbs/yr	0.00	2.72	0.00	9.79	0.00	18.57	0.00	3.07	0.00	3.00	0.00	41.43	0.00	2.37	0.00	520.52	0.00	1.70	0.00	11.50	0.00	648.37	0.00	8.59	0.00	2.12
total removal %	%	100.00	24.78	100.00	52.33	0.00	42.67	100.00	0.03	100.00	66.90	100.00	69.27	100.00	29.43	100.00	54.49	100.00	0.01	100.00	0.01	100.00	59.64	100.00	0.01	100.00	0.04
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	0.41	1.00	1.87	1.00	1.39	1.00	0.10	1.00	4.10	1.00	6.19	1.00	0.49	1.00	1.82	1.00	0.00	1.00	0.10	1.00	3.63	1.00	0.10	1.00	0.10
relative volume	inches	0.00	0.56	0.00	6.91	0.00	1.65	0.00	0.00	0.00	26.19	0.00	18.97	0.00	0.99	0.00	1.43	0.00	0.00	0.00	0.00	0.00	3.15	0.00	0.00	0.00	0.00
residence time	years	87585.71	0.02	87585.71	0.20	87585.71	0.05	87585.71	0.00	87585.71	0.76	87585.71	0.47	87585.71	0.03	87585.71	0.00	87585.71	0.00	87585.71	0.00	87585.71	0.02	87585.71	0.00	87585.71	0.00
residence time	days	31968784.45	5.92	31968784.45	72.89	31968784.45	17.35	31968784.45	0.00	31968784.45	276.12	31968784.45	171.19	31968784.45	10.46	31968784.45	1.28	31968784.45	0.00	31968784.45	0.00	31968784.45	5.93	31968784.45	0.00	31968784.45	0.00
overflow rate	ft/yr	0.00	25.49	0.00	9.34	0.00	29.32	0.00	28826.25	0.00	5.41	0.00	13.20	0.00	17.13	0.00	516.15	0.00	20.71	0.00	108097.04	0.00	223.46	0.00	80365.83	0.00	19927.37
inflow phos conc	ppb	366.44	392.28	366.44	385.53	366.44	364.21	366.44	391.52	366.44	391.52	366.44	366.37	366.44	391.69	366.44	194.64	366.44	391.52	366.44	391.52	366.44	217.04	366.44	393.43	366.44	391.52
outflow phos conc	ppb	366.44	295.05	366.44	183.78	366.44	208.79	366.44	391.42	366.44	129.61	366.44	118.30	366.44	276.44	366.44	175.90	366.44	391.46	366.44	391.49	366.44	155.71	366.44	393.39	366.44	391.38
p reaction rate	-	1.57	0.44	1.57	2.30	1.57	1.30	1.57	0.00	1.57	6.10	1.57	6.49	1.57	0.59	1.57	0.12	1.57	0.00	1.57	0.00	1.57	0.55	1.57	0.00	1.57	0.00
1-rp	-	1.00	0.75	1.00	0.48	1.00	0.57	1.00	1.00	1.00	0.33	1.00	0.32	1.00	0.71	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.72	1.00	1.00	1.00	1.00
vlawmo pond volume	acre-ft	0.00	0.18	0.00	0.67	0.00	1.35	0.00	0.21	0.00	0.20	0.00	2.45	0.00	0.16	0.00	3.06	0.00	0.12	0.00	0.78	0.00	7.97	0.00	0.58	0.00	0.14
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	392.10	0.00	371.51	0.00	368.61	0.00	391.50	0.00	391.50	0.00	363.01	0.00	391.63	0.00	385.42	0.00	391.50	0.00	391.50	0.00	373.73	0.00	393.07	0.00	391.50
runoff coefficient		0.00	0.22	0.00	0.20	0.00	0.28	0.00	0.22	0.00	0.22	0.00	0.19	0.00	0.22	0.00	0.23	0.00	0.22	0.00	0.22	0.00	0.21	0.00	0.23	0.00	0.22
dissolved/total P		0.00	0.30	0.00	0.33	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.34	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	140.00	0.00	147.65	0.00	140.00	0.00	140.00	0.00	140.00	0.00	151.32	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	148.78	0.00	140.00	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	966.93	0.00	3592.31	0.00	7118.23	0.00	1093.67	0.00	1068.24	0.00	13134.63	0.00	845.06	0.00	16068.83	0.00	604.89	0.00	4101.20	0.00	43051.20	0.00	3049.08	0.00	756.05
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1168.45	0.00	0.00	0.00	36649.56	0.00	0.00	0.00	0.00	0.00	46033.55	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**966.93**	**0.00**	**3592.31**	**0.00**	**7118.23**	**0.00**	**1093.67**	**0.00**	**1068.24**	**0.00**	**14303.07**	**0.00**	**845.06**	**0.00**	**52718.39**	**0.00**	**604.89**	**0.00**	**4101.20**	**0.00**	**89084.75**	**0.00**	**3049.08**	**0.00**	**756.05**
p removal efficiency (no inf)	%	0.00	27.00	0.00	55.00	0.00	44.00	0.00	0.00	0.00	69.00	0.00	70.00	0.00	32.00	0.00	11.00	0.00	0.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00
tss removal efficiency (no inf)	%	0.00	53.04	0.00	91.50	0.00	69.33	0.00	0.00	0.00	93.00	0.00	93.00	0.00	58.50	0.00	21.61	0.00	0.00	0.00	0.00	0.00	56.75	0.00	0.00	0.00	0.00
net sedimentation	lbs/yr	0.00	512.82	0.00	3286.96	0.00	4935.31	0.00	0.00	0.00	993.47	0.00	13301.86	0.00	494.36	0.00	11390.94	0.00	0.00	0.00	0.00	0.00	50555.60	0.00	0.00	0.00	0.00
outflow	lbs/yr	0.00	454.11	0.00	305.35	0.00	2182.92	0.00	1093.67	0.00	74.78	0.00	1001.22	0.00	350.70	0.00	41327.45	0.00	604.89	0.00	4101.20	0.00	38529.15	0.00	3049.08	0.00	756.05
tss removal efficiency (inf)	%	100.00	53.04	100.00	91.50	0.00	69.33	100.00	0.00	100.00	93.00	100.00	93.00	100.00	58.50	100.00	21.61	100.00	0.00	100.00	0.00	100.00	56.75	100.00	0.00	100.00	0.00
upstream watershed tss load	lbs/yr	0.00	966.93	0.00	3592.31	0.00	7118.23	0.00	1093.67	0.00	1068.24	0.00	15296.54	0.00	845.06	0.00	190608.93	0.00	604.89	0.00	4101.20	0.00	238366.23	0.00	3049.08	0.00	756.05
tss total removal efficiency	%	100.00	53.04	100.00	91.50	0.00	69.33	100.00	0.00	100.00	93.00	100.00	93.45	100.00	58.50	100.00	78.32	100.00	0.00	100.00	0.00	100.00	83.84	100.00	0.00	100.00	0.00
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**2.55**	**0.00**	**9.34**	**0.00**	**18.76**	**0.00**	**2.88**	**0.00**	**2.82**	**0.00**	**39.59**	**0.00**	**2.23**	**0.00**	**495.51**	**0.00**	**1.59**	**0.00**	**10.81**	**0.00**	**618.31**	**0.00**	**8.04**	**0.00**	**1.99**
Adjusted TP outflow	**lbs/yr**	**0.00**	**2.04**	**0.00**	**4.67**	**0.00**	**10.65**	**0.00**	**3.07**	**0.00**	**0.99**	**0.00**	**12.73**	**0.00**	**1.67**	**0.00**	**236.90**	**0.00**	**1.70**	**0.00**	**11.50**	**0.00**	**261.68**	**0.00**	**8.59**	**0.00**	**2.12**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**454.11**	**0.00**	**305.35**	**0.00**	**2182.92**	**0.00**	**1093.67**	**0.00**	**74.78**	**0.00**	**1001.22**	**0.00**	**350.70**	**0.00**	**41327.45**	**0.00**	**604.89**	**0.00**	**4101.20**	**0.00**	**38529.15**	**0.00**	**3049.08**	**0.00**	**756.05**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	3.09	0.00	11.11	0.00	19.59	0.00	3.53	0.00	3.44	0.00	40.53	0.00	2.72	0.00	49.24	0.00	1.95	0.00	13.22	0.00	129.20	0.00	9.58	0.00	2.44
Adjusted TP outflow	**lbs/yr**	**0.00**	**2.26**	**0.00**	**5.07**	**0.00**	**11.05**	**0.00**	**3.52**	**0.00**	**1.08**	**0.00**	**13.79**	**0.00**	**1.86**	**0.00**	**251.50**	**0.00**	**1.95**	**0.00**	**13.22**	**0.00**	**278.84**	**0.00**	**9.58**	**0.00**	**2.44**
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.60	0.00	0.00	0.00	230.71	0.00	0.00	0.00	0.00	0.00	266.67	0.00	0.00	0.00	0.00
total inflow	**lbs/yr**	**0.00**	**3.09**	**0.00**	**11.11**	**0.00**	**19.59**	**0.00**	**3.53**	**0.00**	**3.44**	**0.00**	**45.13**	**0.00**	**2.72**	**0.00**	**279.94**	**0.00**	**1.95**	**0.00**	**13.22**	**0.00**	**395.87**	**0.00**	**9.58**	**0.00**	**2.44**
outflow	lbs/yr	0.00	2.26	0.00	5.07	0.00	11.05	0.00	3.52	0.00	1.08	0.00	13.79	0.00	1.86	0.00	251.50	0.00	1.95	0.00	13.22	0.00	278.84	0.00	9.58	0.00	2.44
inflow phos conc	ppb	381.54	445.56	381.54	437.54	381.54	384.22	381.54	450.02	381.54	450.02	381.54	419.40	381.54	449.00	381.54	207.86	381.54	450.02	381.54	450.02	381.54	235.56	381.54	438.79	381.54	450.02
outflow phos conc	ppb	381.54	326.50	381.54	199.59	381.54	216.74	381.54	449.89	381.54	140.82	381.54	128.18	381.54	306.92	381.54	186.74	381.54	449.94	381.54	449.99	381.54	165.92	381.54	438.75	381.54	449.83
p reaction rate	-	1.63	0.50	1.63	2.61	1.63	1.37	1.63	0.00	1.63	7.02	1.63	7.43	1.63	0.68	1.63	0.13	1.63	0.00	1.63	0.00	1.63	0.60	1.63	0.00	1.63	0.00
1-rp	-	1.00	0.73	1.00	0.46	1.00	0.56	1.00	1.00	1.00	0.31	1.00	0.31	1.00	0.68	1.00	0.90	1.00	1.00	1.00	1.00	1.00	0.70	1.00	1.00	1.00	1.00
runoff total p calc	ppb	0.00	446.45	0.00	420.71	0.00	394.84	0.00	450.00	0.00	450.00	0.00	412.71	0.00	449.20	0.00	434.36	0.00	450.00	0.00	450.00	0.00	420.68	0.00	440.78	0.00	450.00

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-38	WVR-38	Future WVR-40	WVR-40	Future WVR-41	WVR-41	Future WVR-42	WVR-42	Future WVR-4333	WVR-4333	Future WVR-4334	WVR-4334	Future WVR-4335	WVR-4335	Future WVR-4336	WVR-4336	Future WVR-4337	WVR-4337	Future WVR-4338	WVR-4338	Future WVR-44	WVR-44	Future WVR-440	WVR-440	Future WVR-441	WVR-441
		WVR-38	WVR-19	WVR-40	WVR-41	WVR-41	WVR-27	WVR-42	WVR-27	WVR-4333	WVR-443	WVR-4334	WVR-4333	WVR-4335	WVR-4333	WVR-4336	WVR-4335	WVR-4337	WVR-4335	WVR-4338	WVR-443	WVR-44	WVR-443	WVR-440	WVR-4410	WVR-441	WVR-443
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	28.6	0.00	277.5	0.00	70.1	0.00	68.4	1.20	11.5	1.04	8.0	0.00	8.4	0.00	6.1	0.03	20.5	22.78	0.1	0.00	92.4	4.24	10.4	1.02	23.7
Total watershed area (w/o wat	acres	0.00	28.3	0.00	273.8	0.00	69.2	0.00	67.7	1.20	10.5	1.04	7.5	0.00	8.0	0.00	5.7	0.03	20.2	22.78	0.1	0.00	91.3	4.24	9.3	1.02	23.1
basin area	acres	0.00	0.31	0.00	3.67	0.00	0.94	0.00	0.70	0.00	1.00	0.00	0.44	0.00	0.43	0.00	0.36	0.00	0.36	0.00	0.00	0.00	1.08	0.00	1.05	0.00	0.68
basin volume	acre-ft	0.00	0.27	0.00	12.82	0.00	2.03	0.00	1.03	0.00	1.87	0.00	0.48	0.00	0.46	0.00	0.34	0.00	0.34	0.00	0.00	0.00	3.45	0.00	4.22	0.00	1.41
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	100%	0%	61%	0%	69%	0%	49%	100%	55%	29%	44%	0%	100%	0%	100%	0%	96%	3%	77%	0%	8%	0%	86%	0%	75%
Medium Density Residential		0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	71%	0%	0%	0%	0%	0%	100%	4%	95%	0%	0%	0%	19%	0%	100%	15%
High Density Residential		0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	81%	0%	13%	0%	9%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	28%	0%	31%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	81%	0%	0%	0%
Park		0%	0%	0%	4%	0%	0%	0%	14%	0%	45%	0%	56%	0%	0%	0%	0%	0%	0%	0%	23%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	2%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	1%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	40.58	0.00	683.01	0.00	752.20	0.00	67.70	1.20	54.14	1.04	8.56	0.00	33.88	0.00	5.70	0.03	20.19	22.78	22.90	0.00	91.28	4.24	13.58	1.02	61.73
tributary water area	ac	0.00	0.31	0.00	55.21	0.00	56.15	0.00	0.70	0.00	2.59	0.00	0.44	0.00	1.15	0.00	0.36	0.00	0.36	0.00	0.00	0.00	1.08	0.00	1.05	0.00	3.34
direct and ponded area	ac	0.00	40.89	0.00	738.22	0.00	808.35	0.00	68.40	1.20	56.73	1.04	9.00	0.00	35.03	0.00	6.06	0.03	20.55	22.78	22.90	0.00	92.36	4.24	14.63	1.02	65.07
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.52	0.00	369.99	0.00	378.56	0.00	363.04	391.50	328.21	391.50	312.18	0.00	391.50	0.00	391.50	391.50	391.50	390.84	358.46	0.00	358.61	357.70	386.20	391.46	387.73
runoff ortho p/total p	-	0.30	0.30	0.30	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.45	0.00	8.60	0.00	8.76	0.00	8.76	7.45	5.57	9.68	5.09	0.00	7.45	0.00	7.45	10.60	7.57	10.57	6.47	0.00	13.65	14.02	8.42	10.60	8.61
unit export	lbs/ac-y	0.00	0.66	0.00	0.73	0.00	0.74	0.00	0.73	0.66	0.45	0.86	0.39	0.00	0.66	0.00	0.66	0.94	0.67	0.93	0.55	0.00	1.10	1.13	0.73	0.94	0.75
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	17.56	0.00	196.12	0.00	50.49	0.00	49.40	0.75	4.87	0.84	3.19	0.00	4.96	0.00	3.54	0.02	12.72	20.06	0.06	0.00	103.85	4.95	6.56	0.90	16.55
upstream pond	ac-ft/yr	0.00	8.04	0.00	238.13	0.00	434.25	0.00	0.00	0.00	24.72	0.00	0.14	0.00	16.27	0.00	0.00	0.00	0.01	0.00	8.15	0.00	0.00	0.00	1.34	0.00	33.08
total inflow	**ac-ft/yr**	**0.00**	**25.59**	**0.00**	**434.25**	**0.00**	**484.75**	**0.00**	**49.40**	**0.75**	**29.58**	**0.84**	**3.34**	**0.00**	**21.23**	**0.00**	**3.54**	**0.02**	**12.73**	**20.06**	**8.21**	**0.00**	**103.85**	**4.95**	**7.90**	**0.90**	**49.62**
outflow	ac-ft/yr	0.00	25.59	0.00	434.25	0.00	484.75	0.00	49.40	0.15	29.58	0.14	3.34	0.00	21.23	0.00	3.54	0.01	12.73	8.15	8.21	0.00	103.85	1.34	7.90	0.41	49.62
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	18.68	0.00	198.93	0.00	51.37	0.00	49.65	0.79	4.69	0.89	2.96	0.00	5.28	0.00	3.76	0.02	13.54	21.30	0.06	0.00	100.36	4.79	6.81	0.96	17.32
upstream pond	lbs/yr	0.00	8.59	0.00	138.36	0.00	201.80	0.00	0.00	0.00	13.24	0.00	0.20	0.00	10.81	0.00	0.00	0.00	0.01	0.00	11.93	0.00	0.00	0.00	1.97	0.00	10.73
total inflow	**lbs/yr**	**0.00**	**27.28**	**0.00**	**337.29**	**0.00**	**253.16**	**0.00**	**49.65**	**0.79**	**17.94**	**0.89**	**3.16**	**0.00**	**16.09**	**0.00**	**3.76**	**0.02**	**13.55**	**21.30**	**11.99**	**0.00**	**100.36**	**4.79**	**8.78**	**0.96**	**28.05**
net sedimentation	lbs/yr	0.00	7.33	0.00	135.50	0.00	27.79	0.00	17.94	0.64	7.03	0.69	1.38	0.00	4.78	0.00	1.61	0.01	4.89	9.37	0.00	0.00	45.50	2.82	5.85	0.36	8.97
outflow	lbs/yr	0.00	19.94	0.00	201.80	0.00	225.38	0.00	31.72	0.15	10.90	0.20	1.78	0.00	11.31	0.00	2.15	0.01	8.66	11.93	11.99	0.00	54.87	1.97	2.93	0.60	19.09
p removal efficiency	%	100.00	26.88	100.00	40.17	100.00	10.98	100.00	36.13	80.75	39.21	77.14	43.80	100.00	29.70	100.00	42.79	37.14	36.11	43.98	0.01	100.00	45.33	58.97	66.66	37.07	31.96
upstream w-shed p load	lbs/yr	0.00	27.28	0.00	448.26	0.00	499.62	0.00	49.65	0.79	31.94	0.89	3.85	0.00	22.61	0.00	3.76	0.02	13.56	21.30	21.36	0.00	100.36	4.79	11.60	0.96	54.32
total removal %	%	100.00	26.89	100.00	54.98	100.00	54.89	100.00	36.13	80.75	65.87	77.14	53.82	100.00	49.96	100.00	42.79	37.14	36.15	43.98	43.85	100.00	45.33	58.97	74.78	37.07	64.86
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	0.87	1.00	3.49	1.00	2.16	1.00	1.47	1.00	1.87	1.00	1.09	1.00	1.07	1.00	0.96	1.00	0.96	1.00	0.10	1.00	3.19	1.00	4.02	1.00	2.07
relative volume	inches	0.00	0.53	0.00	2.26	0.00	1.39	0.00	0.72	0.00	13.27	0.00	5.20	0.00	3.22	0.00	3.37	0.00	0.94	0.00	0.01	0.00	1.15	0.00	22.29	0.00	2.95
residence time	years	87585.71	0.01	87585.71	0.03	87585.71	0.00	87585.71	0.02	0.00	0.06	0.00	0.14	87585.71	0.02	87585.71	0.10	0.00	0.03	0.00	0.00	87585.71	0.03	0.00	0.53	0.00	0.03
residence time	days	31968784.45	3.83	31968784.45	10.78	31968784.45	1.53	31968784.45	7.59	0.00	23.02	0.00	52.50	31968784.45	7.94	31968784.45	35.51	0.04	9.87	0.00	0.00	31968784.45	12.13	0.00	195.00	0.00	10.37
overflow rate	ft/yr	0.00	82.56	0.00	118.33	0.00	515.69	0.00	70.88	148745.12	29.58	142398.12	7.58	0.00	49.38	0.00	9.83	10093.46	35.37	8152313.56	82149.28	0.00	96.16	1343367.36	7.52	412377.86	72.98
inflow phos conc	ppb	366.44	392.13	366.44	285.77	366.44	192.15	366.44	369.77	391.52	223.05	391.52	348.84	366.44	278.86	366.44	391.52	391.52	391.64	390.59	537.17	366.44	355.56	355.84	408.72	391.46	207.97
outflow phos conc	ppb	366.44	286.71	366.44	170.97	366.44	171.06	366.44	236.19	391.52	135.59	391.52	196.06	366.44	196.03	366.44	223.99	391.52	250.20	390.59	537.10	366.44	194.38	355.84	136.28	391.46	141.50
p reaction rate	-	1.57	0.50	1.57	1.12	1.57	0.14	1.57	0.89	0.00	1.06	0.00	1.39	1.57	0.60	1.57	1.31	0.01	0.88	0.00	0.00	1.57	1.52	0.00	6.00	0.00	0.69
1-rp	-	1.00	0.73	1.00	0.60	1.00	0.89	1.00	0.64	1.00	0.61	1.00	0.56	1.00	0.70	1.00	0.57	1.00	0.64	1.00	1.00	1.00	0.55	1.00	0.33	1.00	0.68
vlawmo pond volume	acre-ft	0.00	1.27	0.00	14.16	0.00	3.65	0.00	3.57	0.05	0.35	0.06	0.23	0.00	0.36	0.00	0.26	0.00	0.92	1.45	0.00	0.00	7.50	0.36	0.47	0.07	1.19
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.52	0.00	369.99	0.00	378.56	0.00	363.04	391.50	328.21	391.50	312.18	0.00	391.50	0.00	391.50	391.50	391.50	390.84	358.46	0.00	358.61	357.70	386.20	391.46	387.73
runoff coefficient		0.00	0.22	0.00	0.25	0.00	0.25	0.00	0.25	0.22	0.16	0.28	0.15	0.00	0.22	0.00	0.22	0.31	0.22	0.31	0.19	0.00	0.39	0.41	0.24	0.31	0.25
dissolved/total P		0.00	0.30	0.00	0.31	0.00	0.30	0.00	0.30	0.30	0.30	0.30	0.30	0.00	0.30	0.00	0.30	0.30	0.30	0.30	0.30	0.00	0.30	0.30	0.30	0.30	0.30
runoff TSS conc	ppm	0.00	140.00	0.00	144.82	0.00	140.00	0.00	150.75	140.00	174.00	140.00	182.60	0.00	140.00	0.00	140.00	140.00	140.00	140.00	157.64	0.00	140.00	140.00	140.00	140.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	6661.24	0.00	75197.33	0.00	19156.22	0.00	19271.86	283.00	2108.76	317.17	1446.25	0.00	1882.40	0.00	1342.06	8.38	4827.05	7610.54	25.26	0.00	39401.22	1879.33	2487.21	341.94	6277.71
upstream pond	lbs/yr	0.00	3049.08	0.00	36689.00	0.00	35803.62	0.00	0.00	0.00	2001.62	0.00	63.69	0.00	2066.80	0.00	0.00	0.00	4.46	0.00	3601.12	0.00	0.00	0.00	593.41	0.00	1188.94
total inflow	**lbs/yr**	**0.00**	**9710.32**	**0.00**	**111886.32**	**0.00**	**54959.84**	**0.00**	**19271.86**	**283.00**	**4110.39**	**317.17**	**1509.94**	**0.00**	**3949.20**	**0.00**	**1342.06**	**8.38**	**4831.50**	**7610.54**	**3626.38**	**0.00**	**39401.22**	**1879.33**	**3080.62**	**341.94**	**7466.66**
p removal efficiency (no inf)	%	0.00	29.00	0.00	42.00	0.00	12.00	0.00	38.00	0.00	42.00	0.00	50.00	0.00	32.00	0.00	46.00	0.00	39.00	0.00	0.00	0.00	46.00	0.00	72.00	0.00	34.00
tss removal efficiency (no inf)	%	0.00	55.88	0.00	68.00	0.00	23.57	0.00	64.00	0.00	68.00	0.00	81.00	0.00	58.50	0.00	72.00	0.00	65.00	0.00	0.00	0.00	72.00	0.00	93.00	0.00	60.25
net sedimentation	lbs/yr	0.00	5425.64	0.00	76082.70	0.00	12954.82	0.00	12333.99	0.00	2795.06	0.00	1223.05	0.00	2310.28	0.00	966.28	0.00	3140.48	0.00	0.00	0.00	28368.88	0.00	2864.97	0.00	4498.66
outflow	lbs/yr	0.00	4284.68	0.00	35803.62	0.00	42005.02	0.00	6937.87	75.82	1315.32	63.69	286.89	0.00	1638.92	0.00	375.78	4.46	1691.03	3601.12	3626.38	0.00	11032.34	593.41	215.64	182.16	2968.00
tss removal efficiency (inf)	%	100.00	55.88	100.00	68.00	100.00	23.57	100.00	64.00	73.21	68.00	79.92	81.00	100.00	58.50	100.00	72.00	46.78	65.00	52.68	0.00	100.00	72.00	68.42	93.00	46.73	60.25
upstream watershed tss load	lbs/yr	0.00	9710.32	0.00	169326.66	0.00	188482.87	0.00	19271.86	283.00	12215.07	317.17	1763.42	0.00	8059.89	0.00	1342.06	8.38	4835.42	7610.54	7635.80	0.00	39401.22	1879.33	4366.54	341.94	20383.84
tss total removal efficiency	%	100.00	55.88	100.00	78.86	100.00	77.71	100.00	64.00	73.21	89.23	79.92	83.73	100.00	79.67	100.00	72.00	46.78	65.03	52.68	52.51	100.00	72.00	68.42	95.06	46.73	85.44
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**25.59**	**0.00**	**434.25**	**0.00**	**484.75**	**0.00**	**49.40**	**0.15**	**29.58**	**0.14**	**3.34**	**0.00**	**21.23**	**0.00**	**3.54**	**0.01**	**12.73**	**8.15**	**8.21**	**0.00**	**103.85**	**1.34**	**7.90**	**0.41**	**49.62**
Adjusted TP outflow	**lbs/yr**	**0.00**	**19.94**	**0.00**	**201.80**	**0.00**	**225.38**	**0.00**	**31.72**	**0.15**	**10.90**	**0.20**	**1.78**	**0.00**	**11.31**	**0.00**	**2.15**	**0.01**	**8.66**	**11.93**	**11.99**	**0.00**	**54.87**	**1.97**	**2.93**	**0.60**	**19.09**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**4284.68**	**0.00**	**35803.62**	**0.00**	**42005.02**	**0.00**	**6937.87**	**75.82**	**1315.32**	**63.69**	**286.89**	**0.00**	**1638.92**	**0.00**	**375.78**	**4.46**	**1691.03**	**3601.12**	**3626.38**	**0.00**	**11032.34**	**593.41**	**215.64**	**182.16**	**2968.00**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	21.47	0.00	217.16	0.00	56.07	0.00	53.01	0.91	5.27	1.02	3.29	0.00	6.07	0.00	4.33	0.03	15.56	24.41	0.07	0.00	101.09	4.90	7.60	1.10	19.54
Adjusted TP outflow	**lbs/yr**	**0.00**	**22.07**	**0.00**	**214.95**	**0.00**	**239.61**	**0.00**	**33.27**	**0.91**	**12.08**	**1.02**	**2.20**	**0.00**	**12.34**	**0.00**	**2.37**	**0.03**	**9.59**	**24.41**	**24.48**	**0.00**	**55.14**	**4.90**	**3.61**	**1.10**	**20.77**
upstream pond	lbs/yr	0.00	9.58	0.00	151.52	0.00	214.95	0.00	0.00	0.00	15.45	0.00	1.02	0.00	11.96	0.00	0.00	0.00	0.03	0.00	24.41	0.00	0.00	0.00	4.90	0.00	11.84
total inflow	**lbs/yr**	**0.00**	**31.05**	**0.00**	**368.68**	**0.00**	**271.01**	**0.00**	**53.01**	**0.91**	**20.71**	**1.02**	**4.31**	**0.00**	**18.03**	**0.00**	**4.33**	**0.03**	**15.59**	**24.41**	**24.49**	**0.00**	**101.09**	**4.90**	**12.50**	**1.10**	**31.38**
outflow	lbs/yr	0.00	22.07	0.00	214.95	0.00	239.61	0.00	33.27	0.91	12.08	1.02	2.20	0.00	12.34	0.00	2.37	0.03	9.59	24.41	24.48	0.00	55.14	4.90	3.61	1.10	20.77
inflow phos conc	ppb	381.54	446.38	381.54	312.36	381.54	205.70	381.54	394.76	450.02	257.60	450.02	475.21	381.54	312.42	381.54	450.02	450.02	450.45	447.79	1096.67	381.54	358.14	364.03	582.35	449.89	232.64
outflow phos conc	ppb	381.54	317.28	381.54	182.11	381.54	181.86	381.54	247.76	450.02	150.23	450.02	242.15	381.54	213.84	381.54	246.74	450.02	277.04	447.79	1096.39	381.54	195.35	364.03	168.06	449.89	153.96
p reaction rate	-	1.63	0.57	1.63	1.23	1.63	0.15	1.63	0.95	0.00	1.23	0.00	1.89	1.63	0.67	1.63	1.50	0.01	1.02	0.00	0.00	1.63	1.53	0.00	8.54	0.00	0.77
1-rp	-	1.00	0.71	1.00	0.58	1.00	0.88	1.00	0.63	1.00	0.58	1.00	0.51	1.00	0.68	1.00	0.55	1.00	0.62	1.00	1.00	1.00	0.55	1.00	0.29	1.00	0.66
runoff total p calc	ppb	0.00	449.88	0.00	407.47	0.00	418.82	0.00	392.20	450.00	360.54	450.00	337.88	0.00	450.00	0.00	450.00	450.00	450.00	448.40	403.30	0.00	363.25	368.54	436.50	449.90	440.91

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-4410	WVR-4410	Future WVR-4411	WVR-4411	Future WVR-442	WVR-442	Future WVR-4420	WVR-4420	Future WVR-4421	WVR-4421	Future WVR-4422	WVR-4422	Future WVR-4423	WVR-4423	Future WVR-443	WVR-443	Future WVR-4430	WVR-4430	Future WVR-4431	WVR-4431	Future WVR-4432	WVR-4432	Future WVR-45	WVR-45	Future WVR-46	WVR-46
		WVR-4410	WVR-441	WVR-4411	WVR-441	WVR-442	WVR-443	WVR-4420	WVR-442	WVR-4421	WVR-442	WVR-4422	WVR-442	WVR-4423	WVR-4422	WVR-443	Lakeville	WVR-4430	WVR-443	WVR-4431	WVR-443	WVR-4432	WVR-443	WVR-45	WVR-443	WVR-46	WVR-50
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	5.4	0.01	20.2	0.00	50.1	0.00	17.1	0.00	52.6	0.00	11.5	0.00	16.0	88.46	75.0	25.73	1.0	0.00	3.4	0.00	1.3	24.77	186.4	0.00	56.7
Total watershed area (w/o wat	acres	0.00	5.1	0.01	19.0	0.00	49.2	0.00	17.0	0.00	51.0	0.00	11.4	0.00	15.8	88.46	69.3	25.73	1.0	0.00	3.0	0.00	1.0	24.77	182.2	0.00	54.9
basin area	acres	0.00	0.37	0.00	1.24	0.00	0.97	0.00	0.09	0.00	1.61	0.00	0.11	0.00	0.19	0.00	5.75	0.00	0.00	0.00	0.44	0.00	0.37	0.00	4.17	0.00	1.81
basin volume	acre-ft	0.00	0.82	0.00	8.46	0.00	4.69	0.00	0.21	0.00	5.67	0.00	0.24	0.00	0.59	0.00	20.48	0.00	0.00	0.00	0.47	0.00	0.82	0.00	27.13	0.00	9.58
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	100%	0%	0%	0%	11%	0%	30%	0%	0%	0%	32%	0%	41%	79%	68%	0%	0%	0%	100%	0%	100%	0%	4%	0%	5%
Medium Density Residential		0%	0%	0%	27%	0%	23%	0%	70%	0%	79%	0%	58%	0%	59%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46%
High Density Residential		0%	0%	0%	0%	0%	64%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	35%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	100%	72%	0%	1%	0%	0%	0%	21%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	100%	73%	0%	10%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	65%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Open Space		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	0%	100%	0%	0%	0%	0%	0%	5%	0%	10%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	18.66	0.01	19.01	0.00	144.39	0.00	17.01	0.00	51.02	0.00	27.18	0.00	15.83	88.46	5111.03	25.73	26.71	0.00	2.98	0.00	0.96	24.77	207.01	0.00	127.13
tributary water area	ac	0.00	1.42	0.00	1.24	0.00	2.97	0.00	0.09	0.00	1.61	0.00	0.30	0.00	0.19	0.00	151.22	0.00	0.00	0.00	0.44	0.00	0.37	0.00	4.17	0.00	3.32
direct and ponded area	ac	0.00	20.08	0.01	20.25	0.00	147.36	0.00	17.10	0.00	52.63	0.00	27.48	0.00	16.02	88.46	5262.25	25.73	26.71	0.00	3.42	0.00	1.33	24.77	211.18	0.00	130.45
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	391.50	350.00	361.42	0.00	391.00	0.00	391.50	0.00	382.86	0.00	391.50	0.00	391.50	363.47	393.46	285.27	399.98	0.00	391.50	0.00	391.50	350.00	361.57	0.00	376.10
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	7.45	14.80	13.65	0.00	12.98	0.00	9.66	0.00	11.47	0.00	9.99	0.00	9.31	6.74	8.21	7.32	9.55	0.00	7.45	0.00	7.45	14.80	14.22	0.00	11.08
unit export	lbs/ac-y	0.00	0.66	1.17	1.11	0.00	1.15	0.00	0.86	0.00	0.99	0.00	0.89	0.00	0.83	0.58	0.73	0.53	0.87	0.00	0.66	0.00	0.66	1.17	1.16	0.00	0.94
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	3.15	0.01	21.61	0.00	53.19	0.00	13.69	0.00	48.78	0.00	9.45	0.00	12.28	49.69	47.40	15.69	0.78	0.00	1.85	0.00	0.60	30.56	215.91	0.00	50.69
upstream pond	ac-ft/yr	0.00	7.90	0.00	0.01	0.00	84.20	0.00	0.00	0.00	0.00	0.00	12.28	0.00	0.00	0.00	3620.74	0.00	10.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	78.27
total inflow	**ac-ft/yr**	**0.00**	**11.05**	**0.01**	**21.62**	**0.00**	**137.39**	**0.00**	**13.69**	**0.00**	**48.78**	**0.00**	**21.73**	**0.00**	**12.28**	**49.69**	**3668.14**	**15.69**	**10.78**	**0.00**	**1.85**	**0.00**	**0.60**	**30.56**	**219.48**	**0.00**	**128.96**
outflow	ac-ft/yr	0.00	11.05	0.01	21.62	0.00	137.39	0.00	13.69	0.00	48.78	0.00	21.73	0.00	12.28	33.26	3668.14	10.00	10.78	0.00	1.85	0.00	0.60	3.57	219.48	0.00	128.96
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	3.35	0.01	21.08	0.00	56.52	0.00	14.57	0.00	50.43	0.00	10.05	0.00	13.07	50.92	50.70	13.71	0.85	0.00	1.97	0.00	0.63	29.07	211.39	0.00	51.52
upstream pond	lbs/yr	0.00	2.93	0.00	0.01	0.00	42.52	0.00	0.00	0.00	0.00	0.00	6.43	0.00	0.00	0.00	1686.51	0.00	13.71	0.00	0.00	0.00	0.00	0.00	1.94	0.00	38.16
total inflow	**lbs/yr**	**0.00**	**6.28**	**0.01**	**21.09**	**0.00**	**99.04**	**0.00**	**14.57**	**0.00**	**50.43**	**0.00**	**16.48**	**0.00**	**13.07**	**50.92**	**1737.21**	**13.71**	**14.56**	**0.00**	**1.97**	**0.00**	**0.63**	**29.07**	**213.33**	**0.00**	**89.68**
net sedimentation	lbs/yr	0.00	2.57	0.00	14.66	0.00	42.18	0.00	5.22	0.00	29.47	0.00	4.27	0.00	6.64	3.79	224.03	0.00	0.00	0.00	0.92	0.00	0.38	27.13	133.79	0.00	46.27
outflow	lbs/yr	0.00	3.71	0.01	6.43	0.00	56.86	0.00	9.34	0.00	20.96	0.00	12.22	0.00	6.43	47.13	1513.18	13.71	14.56	0.00	1.05	0.00	0.26	1.94	79.54	0.00	43.41
p removal efficiency	%	100.00	40.99	21.32	69.53	100.00	42.59	100.00	35.85	100.00	58.44	100.00	25.89	100.00	50.78	7.44	12.90	0.00	0.01	100.00	46.58	100.00	59.30	93.34	62.72	100.00	51.59
upstream w-shed p load	lbs/yr	0.00	14.95	0.01	21.09	0.00	144.64	0.00	14.57	0.00	50.43	0.00	23.12	0.00	13.07	50.92	4162.13	13.71	14.56	0.00	1.97	0.00	0.63	29.07	240.46	0.00	128.42
total removal %	%	100.00	75.22	21.32	69.53	100.00	60.69	100.00	35.85	100.00	58.44	100.00	47.16	100.00	50.78	7.44	63.64	0.00	0.01	100.00	46.58	100.00	59.30	93.34	66.92	100.00	66.20
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	2.22	1.00	6.82	1.00	4.84	1.00	2.33	1.00	3.52	1.00	2.18	1.00	3.11	1.00	3.56	1.00	0.10	1.00	1.07	1.00	2.22	1.00	6.51	1.00	5.30
relative volume	inches	0.00	9.01	0.00	13.55	0.00	3.05	0.00	0.53	0.00	4.02	0.00	0.88	0.00	1.66	0.00	14.96	0.00	0.00	0.00	8.80	0.00	47.64	0.00	4.35	0.00	6.54
residence time	years	87585.71	0.07	0.00	0.39	87585.71	0.03	87585.71	0.02	87585.71	0.12	87585.71	0.01	87585.71	0.05	0.00	0.01	0.00	0.00	87585.71	0.25	87585.71	1.38	0.00	0.12	87585.71	0.07
residence time	days	31968784.45	27.09	0.07	142.85	31968784.45	12.46	31968784.45	5.60	31968784.45	42.43	31968784.45	4.03	31968784.45	17.54	0.00	2.04	0.00	0.00	31968784.45	92.82	31968784.45	502.31	0.00	45.12	31968784.45	27.12
overflow rate	ft/yr	0.00	29.86	5299.46	17.43	0.00	141.64	0.00	152.09	0.00	30.30	0.00	197.52	0.00	64.64	33264377.34	637.94	9999091.68	107821.28	0.00	4.20	0.00	1.61	3573359.56	52.63	0.00	71.32
inflow phos conc	ppb	366.44	209.06	350.02	358.92	366.44	265.23	366.44	391.52	366.44	380.37	366.44	279.14	366.44	391.52	377.02	174.24	321.33	496.74	366.44	391.52	366.44	391.52	350.02	357.60	366.44	255.86
outflow phos conc	ppb	366.44	123.38	350.02	109.38	366.44	152.27	366.44	251.15	366.44	158.10	366.44	206.87	366.44	192.70	377.02	151.77	321.33	496.70	366.44	209.15	366.44	159.34	350.02	133.33	366.44	123.85
p reaction rate	-	1.57	1.18	0.01	7.49	1.57	1.29	1.57	0.87	1.57	3.38	1.57	0.47	1.57	2.10	0.00	0.17	0.00	0.00	1.57	1.63	1.57	3.58	0.00	4.51	1.57	2.20
1-rp	-	1.00	0.59	1.00	0.30	1.00	0.57	1.00	0.64	1.00	0.42	1.00	0.74	1.00	0.49	1.00	0.87	1.00	1.00	1.00	0.53	1.00	0.41	1.00	0.37	1.00	0.48
vlawmo pond volume	acre-ft	0.00	0.23	0.00	1.56	0.00	3.84	0.00	0.99	0.00	3.52	0.00	0.68	0.00	0.89	3.59	3.42	1.13	0.06	0.00	0.13	0.00	0.04	2.21	15.59	0.00	3.66
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	391.50	350.00	361.42	0.00	391.00	0.00	391.50	0.00	382.86	0.00	391.50	0.00	391.50	363.47	393.46	285.27	399.98	0.00	391.50	0.00	391.50	350.00	361.57	0.00	376.10
runoff coefficient		0.00	0.22	0.43	0.39	0.00	0.37	0.00	0.28	0.00	0.33	0.00	0.29	0.00	0.27	0.19	0.24	0.21	0.28	0.00	0.22	0.00	0.22	0.43	0.41	0.00	0.32
dissolved/total P		0.00	0.30	0.30	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.00	0.30	0.30	0.30	0.30	0.30	0.00	0.30	0.00	0.30	0.30	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	140.00	140.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	0.00	140.00	154.74	140.00	189.20	140.00	0.00	140.00	0.00	140.00	140.00	140.00	0.00	140.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	1195.38	3.28	8199.00	0.00	20181.03	0.00	5193.41	0.00	18507.31	0.00	3583.90	0.00	4659.44	19806.77	17983.98	6881.13	297.09	0.00	701.19	0.00	226.07	11592.88	81915.23	0.00	19231.17
upstream pond	lbs/yr	0.00	215.64	0.00	2.01	0.00	4935.64	0.00	0.00	0.00	0.00	0.00	465.94	0.00	0.00	0.00	316598.16	0.00	4530.97	0.00	0.00	0.00	0.00	0.00	2091.70	0.00	5048.07
total inflow	**lbs/yr**	**0.00**	**1411.02**	**3.28**	**8201.01**	**0.00**	**25116.66**	**0.00**	**5193.41**	**0.00**	**18507.31**	**0.00**	**4049.84**	**0.00**	**4659.44**	**19806.77**	**334582.14**	**6881.13**	**4828.06**	**0.00**	**701.19**	**0.00**	**226.07**	**11592.88**	**84006.94**	**0.00**	**24279.24**
p removal efficiency (no inf)	%	0.00	44.00	0.00	70.00	0.00	45.00	0.00	39.00	0.00	61.00	0.00	28.00	0.00	54.00	0.00	15.00	0.00	0.00	0.00	49.00	0.00	62.00	0.00	65.00	0.00	53.00
tss removal efficiency (no inf)	%	0.00	69.33	0.00	93.00	0.00	70.00	0.00	65.00	0.00	93.00	0.00	55.00	0.00	90.00	0.00	29.46	0.00	0.00	0.00	78.50	0.00	93.00	0.00	93.00	0.00	87.50
net sedimentation	lbs/yr	0.00	978.31	0.00	7626.94	0.00	17581.66	0.00	3375.72	0.00	17211.80	0.00	2227.41	0.00	4193.49	0.00	98582.24	0.00	0.00	0.00	550.43	0.00	210.24	0.00	78126.45	0.00	21244.33
outflow	lbs/yr	0.00	432.71	2.01	574.07	0.00	7535.00	0.00	1817.69	0.00	1295.51	0.00	1822.43	0.00	465.94	15005.28	235999.91	4530.97	4828.06	0.00	150.76	0.00	15.82	2091.70	5880.49	0.00	3034.90
tss removal efficiency (inf)	%	100.00	69.33	38.62	93.00	100.00	70.00	100.00	65.00	100.00	93.00	100.00	55.00	100.00	90.00	24.24	29.46	34.15	0.00	100.00	78.50	100.00	93.00	81.96	93.00	100.00	87.50
upstream watershed tss load	lbs/yr	0.00	5561.92	3.28	8202.27	0.00	52125.09	0.00	5193.41	0.00	18507.31	0.00	8243.34	0.00	4659.44	19806.77	1585000.15	6881.13	7178.22	0.00	701.19	0.00	226.07	11592.88	93508.12	0.00	48925.71
tss total removal efficiency	%	100.00	92.22	38.62	93.00	100.00	85.54	100.00	65.00	100.00	93.00	100.00	77.89	100.00	90.00	24.24	85.11	34.15	32.74	100.00	78.50	100.00	93.00	81.96	93.71	100.00	93.80
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**11.05**	**0.01**	**21.62**	**0.00**	**137.39**	**0.00**	**13.69**	**0.00**	**48.78**	**0.00**	**21.73**	**0.00**	**12.28**	**33.26**	**3668.14**	**10.00**	**10.78**	**0.00**	**1.85**	**0.00**	**0.60**	**3.57**	**219.48**	**0.00**	**128.96**
Adjusted TP outflow	**lbs/yr**	**0.00**	**3.71**	**0.01**	**6.43**	**0.00**	**56.86**	**0.00**	**9.34**	**0.00**	**20.96**	**0.00**	**12.22**	**0.00**	**6.43**	**47.13**	**1513.18**	**13.71**	**14.56**	**0.00**	**1.05**	**0.00**	**0.26**	**1.94**	**79.54**	**0.00**	**43.41**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**432.71**	**2.01**	**574.07**	**0.00**	**7535.00**	**0.00**	**1817.69**	**0.00**	**1295.51**	**0.00**	**1822.43**	**0.00**	**465.94**	**15005.28**	**235999.91**	**4530.97**	**4828.06**	**0.00**	**150.76**	**0.00**	**15.82**	**2091.70**	**5880.49**	**0.00**	**3034.90**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	3.85	0.01	21.82	0.00	64.83	0.00	16.74	0.00	56.10	0.00	11.55	0.00	15.02	57.83	55.61	13.71	0.85	0.00	2.26	0.00	0.73	29.07	218.36	0.00	55.29
Adjusted TP outflow	**lbs/yr**	**0.00**	**4.18**	**0.01**	**6.56**	**0.00**	**61.57**	**0.00**	**10.34**	**0.00**	**22.41**	**0.00**	**13.44**	**0.00**	**7.05**	**57.83**	**1771.15**	**13.71**	**14.56**	**0.00**	**1.15**	**0.00**	**0.28**	**29.07**	**87.07**	**0.00**	**44.67**
upstream pond	lbs/yr	0.00	3.61	0.00	0.01	0.00	46.19	0.00	0.00	0.00	0.00	0.00	7.05	0.00	0.00	0.00	2022.47	0.00	13.71	0.00	0.00	0.00	0.00	0.00	29.07	0.00	38.37
total inflow	**lbs/yr**	**0.00**	**7.46**	**0.01**	**21.82**	**0.00**	**111.02**	**0.00**	**16.74**	**0.00**	**56.10**	**0.00**	**18.60**	**0.00**	**15.02**	**57.83**	**2078.08**	**13.71**	**14.56**	**0.00**	**2.26**	**0.00**	**0.73**	**29.07**	**247.43**	**0.00**	**93.66**
outflow	lbs/yr	0.00	4.18	0.01	6.56	0.00	61.57	0.00	10.34	0.00	22.41	0.00	13.44	0.00	7.05	57.83	1771.15	13.71	14.56	0.00	1.15	0.00	0.28	29.07	87.07	0.00	44.67
inflow phos conc	ppb	381.54	248.46	350.02	371.47	381.54	297.31	381.54	450.02	381.54	423.12	381.54	315.03	381.54	450.02	428.23	208.43	321.33	496.74	381.54	450.02	381.54	450.01	350.02	414.77	381.54	267.22
outflow phos conc	ppb	381.54	139.27	350.02	111.61	381.54	164.88	381.54	278.02	381.54	169.03	381.54	227.57	381.54	211.20	428.23	177.65	321.33	496.70	381.54	229.82	381.54	173.79	350.02	145.96	381.54	127.45
p reaction rate	-	1.63	1.40	0.01	7.75	1.63	1.45	1.63	1.00	1.63	3.76	1.63	0.53	1.63	2.41	0.00	0.20	0.00	0.00	1.63	1.88	1.63	4.12	0.00	5.23	1.63	2.30
1-rp	-	1.00	0.56	1.00	0.30	1.00	0.55	1.00	0.62	1.00	0.40	1.00	0.72	1.00	0.47	1.00	0.85	1.00	1.00	1.00	0.51	1.00	0.39	1.00	0.35	1.00	0.48
runoff total p calc	ppb	0.00	450.00	350.00	377.51	0.00	448.49	0.00	450.00	0.00	429.13	0.00	450.00	0.00	450.00	409.79	434.80	285.27	399.98	0.00	450.00	0.00	449.99	350.00	374.16	0.00	405.53

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

		Future WVR-47	WVR-47	Future WVR-48	WVR-48	Future WVR-49	WVR-49	Future WVR-50	WVR-50	Future WVR-52	WVR-52	Future WVR-53	WVR-53	Future WVR-54	WVR-54	Future WVR-55	WVR-55	Future WVR-56	WVR-56	Future WVR-560	WVR-560	Future WVR-57	WVR-57	Future WVR-58	WVR-58	Future WVR-59	WVR-59
		WVR-47	WVR-50	WVR-48	WVR-50	WVR-49	WVR-47	WVR-50	WVR-443	WVR-52	WVR-53	WVR-53	WVR-54	WVR-54	WVR-443	WVR-55	WVR-56	WVR-56	WVR-280	WVR-560	WVR-56	WVR-57	WVR-56	WVR-58	WVR-17	WVR-59	WVR-17
INPUT VARIABLES....	UNITS																										
case label	-																										
Total watershed area		0.00	97.4	0.00	14.1	0.00	30.2	0.00	117.3	133.43	2.6	129.54	11.9	105.22	1.1	43.07	87.3	36.46	135.1	0.17	80.1	0.18	19.7	0.00	4.3	0.00	15.3
Total watershed area (w/o wat	acres	0.00	96.7	0.00	13.5	0.00	30.0	0.00	112.9	133.43	2.6	129.54	11.9	105.22	1.1	43.07	86.3	36.46	130.6	0.17	79.1	0.18	19.7	0.00	3.4	0.00	10.9
basin area	acres	0.00	0.69	0.00	0.57	0.00	0.26	0.00	4.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	4.53	0.00	1.02	0.00	0.00	0.00	0.95	0.00	4.31
basin volume	acre-ft	0.00	2.57	0.00	0.28	0.00	0.20	0.00	10.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.97	0.00	32.36	0.00	1.94	0.00	0.00	0.00	1.71	0.00	12.93
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Farmstead		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pits and Quarries		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low Density Residential		0%	38%	0%	0%	0%	90%	0%	58%	23%	0%	0%	0%	6%	0%	0%	0%	32%	0%	0%	16%	100%	4%	0%	0%	0%	47%
Medium Density Residential		0%	47%	0%	100%	0%	0%	0%	2%	7%	0%	11%	0%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
High Density Residential		0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Neighborhood Services		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Commercial		0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Industrial		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	100%	93%	68%	10%	100%	0%	0%	96%	0%	0%	0%	0%
Institutional		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	46%	0%	28%	0%	0%	0%	0%	0%	0%
Mix		0%	0%	0%	0%	0%	0%	0%	0%	54%	0%	77%	0%	70%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Park		0%	0%	0%	0%	0%	0%	0%	4%	16%	0%	12%	0%	0%	0%	0%	0%	0%	44%	0%	56%	0%	0%	0%	0%	0%	0%
Open Space		0%	15%	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Golf Course		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Right-of-Way		0%	0%	0%	0%	0%	2%	0%	17%	0%	100%	0%	64%	0%	100%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Minnesota Zoological Gardens		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	53%
WATERSHED-WIDE ACCOUNTING.....																											
tributary land area	ac	0.00	126.66	0.00	13.54	0.00	29.95	0.00	380.27	133.43	136.00	129.54	277.47	105.22	383.77	43.07	129.35	36.46	395.53	0.17	79.29	0.18	19.83	0.00	3.36	0.00	29.01
tributary water area	ac	0.00	0.95	0.00	0.57	0.00	0.26	0.00	9.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	6.54	0.00	1.02	0.00	0.00	0.00	0.95	0.00	8.31
direct and ponded area	ac	0.00	127.61	0.00	14.11	0.00	30.21	0.00	389.52	133.43	136.00	129.54	277.47	105.22	383.77	43.07	130.34	36.46	402.07	0.17	80.31	0.18	19.83	0.00	4.31	0.00	37.32
ASSUMED EXPORT FACTORS.....																											
season length	yrs	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62	34.62
runoff total p	ppb	0.00	363.11	0.00	391.50	0.00	374.75	0.00	385.15	346.97	399.98	342.48	381.91	362.58	399.95	350.00	353.33	363.23	306.09	350.00	300.93	391.50	351.53	0.00	250.00	0.00	317.02
runoff ortho p/total p	-	0.30	0.34	0.30	0.30	0.30	0.33	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
unit runoff	in/yr	0.00	8.09	0.00	10.60	0.00	6.98	0.00	9.02	11.00	9.55	12.94	10.52	13.33	9.55	17.95	17.39	14.60	8.61	17.95	6.27	7.45	17.57	0.00	4.29	0.00	5.79
unit export	lbs/ac-y	0.00	0.71	0.00	0.94	0.00	0.61	0.00	0.79	0.88	0.87	1.03	0.90	1.08	0.87	1.42	1.39	1.18	0.65	1.42	0.47	0.66	1.40	0.00	0.24	0.00	0.44
POND WATER BUDGETS.....																											
runoff	ac-ft/yr	0.00	65.19	0.00	11.96	0.00	17.41	0.00	84.90	122.28	2.04	139.69	10.46	116.86	0.86	64.44	125.07	44.37	93.69	0.25	41.31	0.11	28.77	0.00	1.20	0.00	5.28
upstream pond	ac-ft/yr	0.00	17.41	0.00	0.00	0.00	0.00	0.00	223.52	0.00	13.84	0.00	68.50	0.00	121.07	0.00	11.97	0.00	221.71	0.00	0.06	0.00	0.11	0.00	0.00	0.00	7.09
total inflow	**ac-ft/yr**	**0.00**	**82.60**	**0.00**	**11.96**	**0.00**	**17.41**	**0.00**	**308.43**	**122.28**	**15.89**	**139.69**	**78.97**	**116.86**	**121.93**	**64.44**	**137.04**	**44.37**	**315.39**	**0.25**	**41.37**	**0.11**	**28.88**	**0.00**	**1.20**	**0.00**	**12.37**
outflow	ac-ft/yr	0.00	82.60	0.00	11.96	0.00	17.41	0.00	308.43	13.84	15.89	52.61	78.97	42.10	121.93	11.97	137.04	14.41	315.39	0.06	41.37	0.11	28.88	0.00	1.20	0.00	12.37
POND PHOSPHORUS BUDGETS.....																											
runoff	lbs/yr	0.00	68.29	0.00	12.73	0.00	18.34	0.00	89.65	117.94	2.22	133.16	10.78	114.15	0.94	61.30	119.61	43.02	84.92	0.24	36.97	0.12	27.42	0.00	0.82	0.00	4.82
upstream pond	lbs/yr	0.00	13.63	0.00	0.00	0.00	0.00	0.00	98.91	0.00	20.26	0.00	99.32	0.00	171.51	0.00	14.79	0.00	143.19	0.00	0.09	0.00	0.12	0.00	0.00	0.00	2.57
total inflow	**lbs/yr**	**0.00**	**81.92**	**0.00**	**12.73**	**0.00**	**18.34**	**0.00**	**188.56**	**117.94**	**22.48**	**133.16**	**110.10**	**114.15**	**172.45**	**61.30**	**134.40**	**43.02**	**228.11**	**0.24**	**37.06**	**0.12**	**27.54**	**0.00**	**0.82**	**0.00**	**7.39**
net sedimentation	lbs/yr	0.00	35.54	0.00	3.62	0.00	4.71	0.00	68.62	97.68	0.00	56.32	0.00	52.75	0.00	46.51	60.42	22.17	130.59	0.14	16.23	0.00	0.00	0.00	0.40	0.00	4.04
outflow	lbs/yr	0.00	46.39	0.00	9.11	0.00	13.63	0.00	119.94	20.26	22.48	76.84	110.10	61.41	172.45	14.79	73.98	20.85	97.51	0.09	20.83	0.12	27.54	0.00	0.42	0.00	3.36
p removal efficiency	%	100.00	43.38	100.00	28.45	100.00	25.66	100.00	36.39	82.82	0.01	42.29	0.00	46.21	0.00	75.87	44.96	51.53	57.25	60.48	43.81	0.00	0.00	100.00	48.93	100.00	54.60
upstream w-shed p load	lbs/yr	0.00	86.63	0.00	12.73	0.00	18.34	0.00	317.43	117.94	120.16	133.16	264.10	114.15	379.19	61.30	180.91	43.02	373.59	0.24	37.20	0.12	27.54	0.00	0.82	0.00	10.21
total removal %	%	100.00	46.45	100.00	28.45	100.00	25.66	100.00	62.22	82.82	81.29	42.29	58.31	46.21	54.52	75.87	59.11	51.53	73.90	60.48	44.02	0.00	0.00	100.00	48.93	100.00	67.13
HYDRAULIC PARAMETERS.....																											
pond mean depth	feet	1.00	3.72	1.00	0.49	1.00	0.77	1.00	2.44	1.00	0.10	1.00	0.10	1.00	0.10	1.00	4.02	1.00	7.14	1.00	1.89	1.00	0.10	1.00	1.80	1.00	3.00
relative volume	inches	0.00	1.36	0.00	0.81	0.00	0.40	0.00	4.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.00	11.96	0.00	1.63	0.00	0.00	0.00	49.38	0.00	84.85
residence time	years	87585.71	0.03	87585.71	0.02	87585.71	0.01	87585.71	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.00	0.05	0.00	0.00	87585.71	1.43	87585.71	1.05
residence time	days	31968784.45	11.36	31968784.45	8.54	31968784.45	4.21	31968784.45	12.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.57	0.00	37.45	0.01	17.12	0.00	0.00	31968784.45	520.65	31968784.45	381.56
overflow rate	ft/yr	0.00	119.71	0.00	20.99	0.00	66.97	0.00	69.94	13844476.26	158885.80	52612957.40	789651.56	42100082.31	1219285.82	11974533.22	138.85	14408695.03	69.61	63812.16	40.40	112322.19	288792.87	0.00	1.26	0.00	2.87
inflow phos conc	ppb	366.44	364.90	366.44	391.52	366.44	387.52	366.44	224.93	354.83	520.61	350.72	513.00	359.40	520.36	350.02	360.81	356.77	266.10	350.02	329.56	391.52	350.83	366.44	250.02	366.44	219.89
outflow phos conc	ppb	366.44	206.62	366.44	280.14	366.44	288.07	366.44	143.07	354.83	520.57	350.72	512.99	359.40	520.35	350.02	198.60	356.77	113.75	350.02	185.19	391.52	350.82	366.44	127.69	366.44	99.84
p reaction rate	-	1.57	1.35	1.57	0.56	1.57	0.46	1.57	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	3.13	0.00	1.39	0.00	0.00	1.57	1.88	1.57	2.65
1-rp	-	1.00	0.57	1.00	0.72	1.00	0.74	1.00	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.55	1.00	0.43	1.00	0.56	1.00	1.00	1.00	0.51	1.00	0.45
vlawmo pond volume	acre-ft	0.00	4.71	0.00	0.86	0.00	1.26	0.00	6.13	8.83	0.15	10.09	0.76	8.44	0.06	4.65	9.03	3.20	6.77	0.02	2.98	0.01	2.08	0.00	0.09	0.00	0.38
LAND USE PARAMETERS.....																											
runoff total P conc	ppb	0.00	363.11	0.00	391.50	0.00	374.75	0.00	385.15	346.97	399.98	342.48	381.91	362.58	399.95	350.00	353.33	363.23	306.09	350.00	300.93	391.50	351.53	0.00	250.00	0.00	317.02
runoff coefficient		0.00	0.23	0.00	0.31	0.00	0.20	0.00	0.26	0.32	0.28	0.37	0.30	0.38	0.28	0.52	0.50	0.42	0.25	0.52	0.18	0.22	0.51	0.00	0.12	0.00	0.17
dissolved/total P		0.00	0.34	0.00	0.30	0.00	0.33	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.30	0.00	0.30
runoff TSS conc	ppm	0.00	151.26	0.00	140.00	0.00	146.70	0.00	143.33	151.88	139.99	149.19	140.00	140.00	139.98	140.00	140.00	140.00	173.38	140.00	182.49	140.00	140.00	0.00	216.00	0.00	180.00
POND TSS BUDGETS.....																											
runoff	lbs/yr	0.00	25158.67	0.00	4538.67	0.00	6685.01	0.00	32482.16	47556.06	775.53	53869.46	3969.90	44336.29	327.55	24448.42	47451.66	16832.51	38738.06	94.22	18135.78	42.62	10914.19	0.00	703.31	0.00	2426.56
upstream pond	lbs/yr	0.00	3008.26	0.00	0.00	0.00	0.00	0.00	12844.90	0.00	6115.52	0.00	30113.59	0.00	52711.91	0.00	5715.57	0.00	32929.08	0.00	28.19	0.00	42.62	0.00	0.00	0.00	384.77
total inflow	**lbs/yr**	**0.00**	**28166.92**	**0.00**	**4538.67**	**0.00**	**6685.01**	**0.00**	**45327.06**	**47556.06**	**6891.05**	**53869.46**	**34083.49**	**44336.29**	**53039.46**	**24448.42**	**53167.23**	**16832.51**	**71667.14**	**94.22**	**18163.97**	**42.62**	**10956.80**	**0.00**	**703.31**	**0.00**	**2811.33**
p removal efficiency (no inf)	%	0.00	46.00	0.00	31.00	0.00	28.00	0.00	38.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	60.00	0.00	45.00	0.00	0.00	0.00	49.00	0.00	56.00
tss removal efficiency (no inf)	%	0.00	72.00	0.00	57.63	0.00	55.00	0.00	64.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.00	0.00	93.00	0.00	70.00	0.00	0.00	0.00	78.50	0.00	93.00
net sedimentation	lbs/yr	0.00	20280.19	0.00	2615.41	0.00	3676.76	0.00	29009.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43065.46	0.00	66650.44	0.00	12714.78	0.00	0.00	0.00	552.10	0.00	2614.54
outflow	lbs/yr	0.00	7886.74	0.00	1923.26	0.00	3008.26	0.00	16317.74	6115.52	6891.05	23222.54	34083.49	18628.42	53039.46	5715.57	10101.77	6421.31	5016.70	28.19	5449.19	42.62	10956.80	0.00	151.21	0.00	196.79
tss removal efficiency (inf)	%	100.00	72.00	100.00	57.63	100.00	55.00	100.00	64.00	87.14	0.00	56.89	0.00	57.98	0.00	76.62	81.00	61.85	93.00	70.08	70.00	0.00	0.00	100.00	78.50	100.00	93.00
upstream watershed tss load	lbs/yr	0.00	31843.68	0.00	4538.67	0.00	6685.01	0.00	117790.22	47556.06	48331.59	53869.46	106170.95	44336.29	150834.79	24448.42	71900.09	16832.51	156657.47	94.22	18230.00	42.62	10956.80	0.00	703.31	0.00	6274.29
tss total removal efficiency	%	100.00	75.23	100.00	57.63	100.00	55.00	100.00	86.15	87.14	85.74	56.89	67.90	57.98	64.84	76.62	85.95	61.85	96.80	70.08	70.11	0.00	0.00	100.00	78.50	100.00	96.86
INFILTRATION BMP/POND……																											
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**82.60**	**0.00**	**11.96**	**0.00**	**17.41**	**0.00**	**308.43**	**13.84**	**15.89**	**52.61**	**78.97**	**42.10**	**121.93**	**11.97**	**137.04**	**14.41**	**315.39**	**0.06**	**41.37**	**0.11**	**28.88**	**0.00**	**1.20**	**0.00**	**12.37**
Adjusted TP outflow	**lbs/yr**	**0.00**	**46.39**	**0.00**	**9.11**	**0.00**	**13.63**	**0.00**	**119.94**	**20.26**	**22.48**	**76.84**	**110.10**	**61.41**	**172.45**	**14.79**	**73.98**	**20.85**	**97.51**	**0.09**	**20.83**	**0.12**	**27.54**	**0.00**	**0.42**	**0.00**	**3.36**
Adjusted TSS outflow	**lbs/yr**	**0.00**	**7886.74**	**0.00**	**1923.26**	**0.00**	**3008.26**	**0.00**	**16317.74**	**6115.52**	**6891.05**	**23222.54**	**34083.49**	**18628.42**	**53039.46**	**5715.57**	**10101.77**	**6421.31**	**5016.70**	**28.19**	**5449.19**	**42.62**	**10956.80**	**0.00**	**151.21**	**0.00**	**196.79**
POND P BUDGETS W/O P-BAN……..																											
runoff	lbs/yr	0.00	78.30	0.00	14.63	0.00	20.99	0.00	99.80	122.35	2.22	135.16	10.78	118.36	0.94	61.30	119.61	44.17	84.92	0.24	38.23	0.14	27.49	0.00	0.82	0.00	5.33
Adjusted TP outflow	**lbs/yr**	**0.00**	**50.82**	**0.00**	**10.14**	**0.00**	**15.16**	**0.00**	**127.68**	**122.35**	**124.53**	**135.16**	**270.46**	**118.36**	**389.75**	**61.30**	**90.49**	**44.17**	**108.10**	**0.24**	**21.37**	**0.14**	**27.63**	**0.00**	**0.42**	**0.00**	**3.53**
upstream pond	lbs/yr	0.00	15.16	0.00	0.00	0.00	0.00	0.00	105.63	0.00	122.35	0.00	259.69	0.00	388.82	0.00	61.30	0.00	183.66	0.00	0.24	0.00	0.14	0.00	0.00	0.00	2.64
total inflow	**lbs/yr**	**0.00**	**93.47**	**0.00**	**14.63**	**0.00**	**20.99**	**0.00**	**205.43**	**122.35**	**124.58**	**135.16**	**270.47**	**118.36**	**389.75**	**61.30**	**180.91**	**44.17**	**268.58**	**0.24**	**38.47**	**0.14**	**27.63**	**0.00**	**0.82**	**0.00**	**7.98**
outflow	lbs/yr	0.00	50.82	0.00	10.14	0.00	15.16	0.00	127.68	122.35	124.53	135.16	270.46	118.36	389.75	61.30	90.49	44.17	108.10	0.24	21.37	0.14	27.63	0.00	0.42	0.00	3.53
inflow phos conc	ppb	381.54	416.32	381.54	450.02	381.54	443.44	381.54	245.05	368.12	2884.68	355.98	1260.17	372.63	1176.08	350.02	485.68	366.28	313.31	350.02	342.05	450.02	351.97	381.54	250.03	381.54	237.27
outflow phos conc	ppb	381.54	226.36	381.54	311.93	381.54	320.41	381.54	152.30	368.12	2883.70	355.98	1260.13	372.63	1176.06	350.02	242.95	366.28	126.10	350.02	190.04	450.02	351.96	381.54	127.69	381.54	104.85
p reaction rate	-	1.63	1.54	1.63	0.64	1.63	0.53	1.63	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	3.69	0.00	1.44	0.00	0.00	1.63	1.88	1.63	2.86
1-rp	-	1.00	0.54	1.00	0.69	1.00	0.72	1.00	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	0.40	1.00	0.56	1.00	1.00	1.00	0.51	1.00	0.44
runoff total p calc	ppb	0.00	412.84	0.00	450.00	0.00	427.14	0.00	429.29	364.74	399.98	348.91	381.91	380.32	399.95	350.00	353.33	381.89	306.11	350.00	310.38	450.00	353.69	0.00	250.01	0.00	344.73

Apple Valley Loading Assessment
68-07360
Ultimate (2020) TP LOADS

copied from Loads-1 for accounting purposes

		Future WVR-590	WVR-590	Future WVR-60	WVR-60	WVR-LL	AL-LL	KL-4
		WVR-590	WVR-59	WVR-60	WVR-1	Lakeville	AL-9	WVR-46
INPUT VARIABLES....	UNITS							
case label	-							
Total watershed area		0.00	22.1	0.00	3.4	0.0	0.0	73.7
Total watershed area (w/o wat	acres	0.00	18.1	0.00	3.0	0.0	0.0	72.2
basin area	acres	0.00	4.00	0.00	0.36	0.00	0.00	1.5
basin volume	acre-ft	0.00	8.00	0.00	0.35	0.00	0.00	4.4
Row Crop Agriculture		0%	0%	0%	0%	0%	0%	0.0
Farmstead		0%	0%	0%	0%	0%	0%	0.0
Pits and Quarries		0%	0%	0%	0%	0%	0%	0.0
Low Density Residential		0%	13%	0%	100%	0%	0%	0.0
Medium Density Residential		0%	0%	0%	0%	0%	0%	0.0
High Density Residential		0%	0%	0%	0%	0%	0%	0.0
Neighborhood Services		0%	0%	0%	0%	0%	0%	0.0
Commercial		0%	0%	0%	0%	0%	0%	0.6
Industrial		0%	0%	0%	0%	0%	0%	0.0
Institutional		0%	0%	0%	0%	0%	0%	0.0
Mix		0%	0%	0%	0%	0%	0%	0.0
Park		0%	0%	0%	0%	0%	0%	0.0
Open Space		0%	0%	0%	0%	100%	100%	0.0
Golf Course		0%	0%	0%	0%	0%	0%	0.0
Right-of-Way		0%	0%	0%	0%	0%	0%	0.3
Minnesota Zoological Gardens		0%	87%	0%	0%	0%	0%	0.0
WATERSHED-WIDE ACCOUNTING.....								
tributary land area	ac	0.00	18.07	0.00	3.00	103.42	16.29	72.2
tributary water area	ac	0.00	4.00	0.00	0.36	3.54	0.57	1.5
direct and ponded area	ac	0.00	22.07	0.00	3.36	106.96	16.86	73.7
ASSUMED EXPORT FACTORS.....								
season length	yrs	1	1	1	1	1	1	1.0
season precipitation	inches	34.62	34.62	34.62	34.62	34.62	34.62	34.6
runoff total p	ppb	0.00	268.70	0.00	391.50	200.00	200.00	365.7
runoff ortho p/total p	-	0.30	0.30	0.30	0.30	0.30	0.30	0.3
unit runoff	in/yr	0.00	4.71	0.00	7.45	1.73	1.73	13.0
unit export	lbs/ac-y	0.00	0.30	0.00	0.66	0.08	0.08	1.1
POND WATER BUDGETS.....								
runoff	ac-ft/yr	0.00	7.09	0.00	1.86	0.00	0.00	78.3
upstream pond	ac-ft/yr	0.00	0.00	0.00	0.00	56.00	8.05	0.0
total inflow	**ac-ft/yr**	**0.00**	**7.09**	**0.00**	**1.86**	**56.00**	**8.05**	78.3
outflow	ac-ft/yr	0.00	7.09	0.00	1.86	56.00	8.05	78.3
POND PHOSPHORUS BUDGETS.....								
runoff	lbs/yr	0.00	5.39	0.00	1.98	0.00	0.00	76.9
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	37.98	6.31	0.0
total inflow	**lbs/yr**	**0.00**	**5.39**	**0.00**	**1.98**	**37.98**	**6.31**	76.9
net sedimentation	lbs/yr	0.00	2.82	0.00	0.88	0.00	0.00	38.7
outflow	lbs/yr	0.00	2.57	0.00	1.10	37.97	6.30	38.2
p removal efficiency	%	100.00	52.30	100.00	44.42	0.01	0.07	50.4
upstream w-shed p load	lbs/yr	0.00	5.39	0.00	1.98	56.56	9.26	76.9
total removal %	%	100.00	52.30	100.00	44.42	32.86	31.92	50.4
HYDRAULIC PARAMETERS.....								
pond mean depth	feet	1.00	2.00	1.00	0.96	10.00	10.00	2.9
relative volume	inches	0.00	39.04	0.00	6.46	0.00	0.00	1.9
residence time	years	87585.71	1.13	87585.71	0.19	0.00	0.00	0.1
residence time	days	31968784.45	411.57	31968784.45	68.10	0.00	0.00	20.4
overflow rate	ft/yr	0.00	1.77	0.00	5.14	5599939.76	804760.45	51.8
inflow phos conc	ppb	366.44	279.57	366.44	391.52	249.52	288.35	361.5
outflow phos conc	ppb	366.44	133.35	366.44	217.61	249.50	288.16	179.4
p reaction rate	-	1.57	2.30	1.57	1.44	0.00	0.00	2.0
1-rp	-	1.00	0.48	1.00	0.56	1.00	1.00	0.5
vlawmo pond volume	acre-ft	0.00	0.51	0.00	0.13	0.00	0.00	5.7
LAND USE PARAMETERS.....								
runoff total P conc	ppb	0.00	268.70	0.00	391.50	200.00	200.00	365.7
runoff coefficient		0.00	0.14	0.00	0.22	0.05	0.05	0.4
dissolved/total P		0.00	0.30	0.00	0.30	0.60	0.60	0.3
runoff TSS conc	ppm	0.00	205.96	0.00	140.00	216.00	216.00	140.0
POND TSS BUDGETS.....								
runoff	lbs/yr	0.00	3847.73	0.00	706.37	0.01	0.01	29694.5
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	8676.84	1340.59	0.0
total inflow	**lbs/yr**	**0.00**	**3847.73**	**0.00**	**706.37**	**8676.84**	**1340.60**	29694.5
p removal efficiency (no inf)	%	0.00	54.00	0.00	47.00	0.00	0.00	51.0
tss removal efficiency (no inf)	%	0.00	90.00	0.00	74.00	0.00	0.00	83.0
net sedimentation	lbs/yr	0.00	3462.95	0.00	522.71	0.00	0.00	24646.5
outflow	lbs/yr	0.00	384.77	0.00	183.66	8676.84	1340.60	5048.1
tss removal efficiency (inf)	%	100.00	90.00	100.00	74.00	0.00	0.00	83.0
upstream watershed tss load	lbs/yr	0.00	3847.73	0.00	706.37	22871.96	3384.10	29694.5
tss total removal efficiency	%	100.00	90.00	100.00	74.00	62.06	60.39	83.0
INFILTRATION BMP/POND……								
Annual runoff infiltrated	%	0%	0%	0%	0%	0%	0%	0%
Adjusted outflow	**ac-ft/yr**	**0.00**	**7.09**	**0.00**	**1.86**	**56.00**	**8.05**	78.3
Adjusted TP outflow	**lbs/yr**	**0.00**	**2.57**	**0.00**	**1.10**	**37.97**	**6.30**	38.2
Adjusted TSS outflow	**lbs/yr**	**0.00**	**384.77**	**0.00**	**183.66**	**8676.84**	**1340.60**	5048.1

POND P BUDGETS W/O P-BAN…….								
runoff	lbs/yr	0.00	5.63	0.00	2.28	0.00	0.00	77.5
Adjusted TP outflow	**lbs/yr**	**0.00**	**2.64**	**0.00**	**1.21**	**42.09**	**6.84**	38.4
upstream pond	lbs/yr	0.00	0.00	0.00	0.00	42.10	6.84	0.0
total inflow	**lbs/yr**	**0.00**	**5.63**	**0.00**	**2.28**	**42.10**	**6.84**	77.5
outflow	lbs/yr	0.00	2.64	0.00	1.21	42.09	6.84	38.4
inflow phos conc	ppb	381.54	291.79	381.54	450.02	276.57	312.84	364.5
outflow phos conc	ppb	381.54	137.14	381.54	239.44	276.54	312.61	180.4
p reaction rate	-	1.63	2.40	1.63	1.65	0.00	0.00	2.1
1-rp	-	1.00	0.47	1.00	0.53	1.00	1.00	0.5
runoff total p calc	ppb	0.00	276.43	0.00	450.00	200.00	200.00	369.8

Appendix D – Proposed Stormwater Pollution Prevention Program (SWPPP) Modifications

BMP Page

MS4 Name: City of Apple Valley

Unique Identifying Number: 5-6

Minimum Control Measures Addressed by This BMP

	Public education & outreach	X	Construction site runoff controls
	Public participation & involvement	X	Post-construction stormwater management
	Illicit discharge detection & elimination		Pollution prevention/Good housekeeping

BMP Title: Surface Water Management Plan (SWMP)

BMP Description: The City developed a Surface Water Management Plan (SWMP) in 1997, which includes Goals and Policies, Watershed Requirements, Agency Requirements, Best Management Practices, watershed descriptions, storm water quality, and infrastructure improvement planning. The City has revised the 1997 SWMP, and it has been reviewed and approved by the Black Dog Watershed Management Organization and the Vermillion River Watershed Joint Powers Organization.

The SWMP contains specific components aimed at achieving compliance with the nondegradation components of the general permit. These components include the following:

- Execution of revised requirements for new and re-development activities to require, at a minimum, no-net-increase in TP and TSS loading as well as runoff volume (Policies 5.2 and 5.4)
- Protection of infiltration capacity in Cobblestone Lake (Policy 5.5)
- Evaluate and, if appropriate, pursue partial diversion/infiltration of discharge from Pond WVR-P443 to the East Vermillion River drainage to meet nondegradation baseline conditions for average annual runoff discharged to Lakeville from Pond WVR-P443.
- Development and implementation of TMDLs/lake management plans for Long, Farquar, and Alimagnet Lakes

Measurable Goals:	**Timeline / Implementation Schedule:**
• City adoption of SWMP • Execute nondegradation-related components outline above	• By October 31, 2007 – Adopt SWMP • Throughout the term of the permit and as scheduled in the SWMP to meet nondeg requirements by 2020.

Specific Components & Notes (optional):

- Watershed drainage districts and subdistricts
- Design standards
- Cost estimate for new storm sewer infrastructure
- Goals and policies
- Compliance with requirements of local Watershed Management Organizations

• Wetland inventory and assessment • Wetland standards and recommendations • Priority lakes and classification	
Responsible Party	**Responsible Department**
Name: Carol Blommel	**Department:** Public Works
Title: Utility Superintendent	**Dept. Head:** Neal Heuer
Phone: (952) 953-2441	**Phone:** (952) 953-2412
E-mail: cblommel@ci.apple-valley.mn.us	**E-mail:** nheuer@ci.apple-valley.mn.us
Educational components related to this BMP (description or number – optional):	