TECHNICAL REPORT

Baseline Summary Report for Sustainable Remediation Options for the M1 Air Stripper at DOE SRS

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Principal Investigator:
Leonel E. Lagos, PhD, PMP®

Prepared by:
David Roelant, PhD
Natalia Duque (DOE Fellow)
Yoel Rotterman (DOE Fellow)

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FIU | Applied Research Center
FLORIDA INTERNATIONAL UNIVERSITY

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Executive Summary

The performance of remediation systems needs to be reviewed periodically to assess their efficiency and effectiveness over the years. New technologies and Best Management Practices have emerged that can improve existing remediation systems. A Green and Sustainable Remediation analysis, the higher energy and/or water usage of older systems might not be justified from an environmental protection rationale. For example, remediation systems can run intermittently and with slower flow rates, use less power, and still provide the required level of environmental remediation and protection.

This research by the Applied Research Center (ARC) at Florida International University (FIU) is the preliminary phase of a Green and Sustainable Remediation (GSR) analysis of the operations of the M1 air stripper and the A/M Area groundwater remediation system at the Savannah River Site (SRS). Over 100 documents were sent to FIU from Savannah River National Laboratory (SRNL) researchers. Data including extensive information on the contaminant concentrations, recovery rates, geographic information systems (GIS) files of the geo-stratigraphy and more. Piping and Instrumentation Diagrams (P&IDs) for the M1 air stripper have been sent to FIU. The design basis, system performance and "As-Built" diagrams of current air stripper system components are still pending and will be critical for later quantitative analyses and system trade off studies needed for any design modifications to the M1 air stripper at SRS.

This report contains a detailed contaminant recovery study from 1987 to 2012 and a mechanical design study based upon the piping and instrumentation diagram (P&ID) only of the M1 air stripper at SRS. The contaminant recovery study included the collection of contaminant recovery data from SRS reports into a database of trichloroethene (TCE) and tetrachloroethene (PCE) removal from contaminant recovery wells RWM-1 through RWM-12. Plots of TCE and PCE recovery over time show that 7 of 12 recovery wells have transitioned to more PCE removal than TCE removal; and that the nearby steam injection remediation of "Dynamic Underground Stripping" mobilized dense non-aqueous phase liquid (DNAPL) and resulted in increased recovery in nearby wells. Separate SRNL studies show that the soil temperature has risen from 55 to 90°C and these temperatures are slowly returning back to original temperatures.

The mechanical design study describes the theory and design optimization of packed column air strippers. The SRS air stripper was the very first operational air stripper deployed in the world. Based upon the P&ID of the M1 air stripper, we have identified several likely design modifications that would improve the efficiency of the system. When SRS is able to release the design basis, system performance and "As-Built" diagrams of current air stripper system components, FIU will be able to perform quantitative design analyses showing costs, system improvements, and potential cost savings.

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Introduction

The Savannah River Site (SRS), located in Aiken, Allendale, and Barnwell Counties in South Carolina, is a nuclear production facility operated for the U.S. Department of Energy (DOE). SRS contains 36,000 acres of wetlands and an additional 5,000 acres of bottomland soils subject to flooding. By the 1950's, the SRS facility was focused on nuclear weapon production and power production. These operations led to the release to the environment of major quantities of contaminants. Like many defense operations sites in the 1970's and 1980's, trichloroethylene (TCE) and tetrachloroethylene (PCE) were the main solvents used in degreasing and other industrial operations. In the 1980's, major operations were initiated to remediate the contaminated soil and groundwater which continues today. This first major environmental cleanup operation at SRS saw the world's first air stripper designed, built and installed to treat contaminated groundwater and soil vapor extraction units for removal of contaminants from air pulled from soil in the vadose zone (above the water table). PCE and TCE are categorized as dense non-aqueous phase liquids (DNAPLs), semi-volatile, and hazardous chemical compounds.

Since 1985, groundwater in the A/M Area on the northern part of SRS has been treated to reduce concentrations of chlorinated solvents. This treatment system consists of groundwater wells from which groundwater in the area is pumped to the M-1 air stripper, which removes chlorinated solvents. The treated groundwater is discharged to a stream of Tims Branch, a small stream ecosystem also in the northern portion of the SRS.

Just upstream of the air stripper, the pumped groundwater is altered with tin (II) chloride ($SnCl_2$ or stannous chloride), which reacts with mercury in the water to reduce it to elemental mercury. The groundwater enters the M-1 air stripper and the elemental mercury, which is more volatile than dissolved mercury, is stripped from the water along with the chlorinated solvents. The mercury concentration in the untreated groundwater is initially approximately 250 ng/L (parts per trillion) and the treatment system reduces the concentration of mercury in the treated groundwater to approximately 10 ng/L.[1]

Since the DOE SRS A/M Area groundwater remediation system is expected to operate continuously for the foreseeable future, any improvements in system performance, increased contaminant recovery or decreased energy consumption, will have positive enduring benefits due to the long time frame over which the benefits will accrue. Increased contaminant recovery will reduce the overall time necessary to meet regulatory requirements. Options for improved contaminant recovery include restoring well efficiency and redistributing pumping within the existing network. Information compiled in the baseline analysis will be used to identify opportunities to increase contaminant recovery using existing wells.

The M1 air stripper has operated continuously for over 27 years at an average electrical load of 150kW and flow rate of 420 gpm. This represents an average of 1,247,000 kW-hr of electricity consumed per year and 209,714,000 gallons pumped per year. The influent TCE concentration to the air stripper has decreased exponentially from 25,200 ug/L in 1986 to 2,230 ug/L by the end of 2012. This concentration decrease is common for groundwater remediation systems that use groundwater pumping. The M1 air stripper at SRS removed 33,231 pounds of TCE during its first full year of operation and removed 2,092 pounds of TCE during its 26th year of operation

while consuming the same amount of electricity and removing the same amount of water in both years. The pumping and overall electrical energy efficiency (per 1 pound of TCE removed and destroyed) has decreased to 6% of the initial year of operation. That is, it now requires 15.9 times more energy and groundwater to remove 1 pound of TCE in the 26th year of operation than it did in the first year of operation. PCE was used early at SRS and operations switched to TCE in the 1970's due to the perceived hazard of PCE. PCE is many times less soluble and less volatile than TCE. For these reasons, recovery for the first 25 years has been dominated by TCE recovery and will be dominated by PCE recovery for the next 25 years. Already, PCE recovery equals or exceeds TCE recovery in 7 of 12 recovery wells. Reducing the environmental costs of the A/M groundwater remediation system will reduce the overall cost to SRS to operate the system through improved mass recovery and reduced use of energy and other site resources.

Recovery wells in the A/M Area groundwater remediation system have been operated with constant speed pumps since the system began operation. The constant speed pumps produce line pressures that range from 35 – 95 psig. In some cases, the pumps may be producing excess pressure that is not required and as a result are continuously consuming energy that is not necessary for operation. The piping diagram and operating pressure throughout the system will be studied to identify wells which may be able to operate using a smaller pump while still maintaining the same flow rate.

The overall objective of the A/M Area groundwater remediation system is to provide hydraulic containment of the most contaminated portion of groundwater until regulatory requirements are met. The M1 air stripper has operated at a constant air/water ratio since it began operation. The air/water ratio was set to treat the prevailing influent contaminant concentrations existing at start-up. Contaminant concentrations have decreased an order of magnitude during the first 27 years of operation and, as a result, the air/water ratio can likely be decreased. The water flow rate is set by the hydraulic containment objective and is not considered to be an option for improvement. The air flow rate, however, is based on the influent contaminant concentration. It is believed that the air flow rate can be reduced and still meet the discharge limits at the outfall receiving effluent from the M1 air stripper. Reducing the air flow rate would significantly reduce the energy demand since the M1 air stripper operates continuously.

Figure 1 contains the spatial locations of the groundwater recover wells, soil vapor extraction units, and Dynamic Underground Stripping wells. Note that the M1 air stripper draws groundwater from recovery wells RWM-1 – RWM-12. The injection of steam for 4 years as part of "Dynamic Underground Stripping" remediation process was very successful in removing and destroying TCE and PCE in the nearby M Area settling basin area. The increased ground temperature has mobilized DNAPL and resulted in increased recovery in several of the RWM 1-12 wells at this DNAPL location. Soil temperatures have been cooling since steam injection ended in 2009 but the elevated temperatures will continue for another decade and continue to enhance removal of TCE and PCE.

Figure 1. Spatial location of buildings, groundwater wells, soil vapor extraction units, and Dynamic Underground Stripping wells for steam injection in A and M areas.

Background - Air Stripping Process

The air stripping process is a mass transfer operation that provides contact between air and water, encouraging the VOCs to move from the water to the air. There are different types of air strippers which should be selected based on the conditions of each site. The most common one is the packed column air stripper which consists of a counter-current flow of water and air through a packing material in a large tower. The packing material is usually plastic, ceramic, or steel with different shapes and sizes that allow a higher surface-to-volume ratio and provide the necessary transfer surface to permit volatile components to move from the liquid stream to the air stream. In the packed column stripper, the contaminated water comes from an aeration nozzle at the top of the tower, and the air is blown from the bottom (Figure 2).[2] Optimal conditions for the packed column air stripper and what parameters need to be taken into account to design it and optimize it will be analyzed more in depth in this report.

Figure 2. Drawing of an air stripping tower.

Since the air stripping process involves association between air and water, we need to know the solubility of the gas in the liquid to determine under what conditions the stripper will work adequately, and how easily the contaminant will be removed. This ratio of the contaminant at equilibrium in the liquid phase to the contaminant in the gaseous phase is a relationship called Henry's Law in which at equilibrium, as air molecules pass into the water, an equivalent number of molecules of the solvents in the liquid leave the water phase and become part of the vapor.

Under equilibrium conditions, the partial pressure of a gas above a liquid is proportional to the concentration of the chemical in the liquid:

$$P_g = H\ C_L$$

Where: P_g is the partial pressure of the gas
H is Henry's constant
C_L is the concentration of the chemical in the liquid

Design[3, 4]

When designing an air stripper, many factors come together. The height of the packed tower will affect the removal efficiency of the contaminant. The desired rate of flow of the liquid will determine the diameter of the air stripping column. The type of packing material, its size and shape, will impact the mass transfer rate. The packing material provides the air-to-water interfacial area which will determine the efficiency of the stripping process. The air-to-water flow ratio will control the removal rate of the contaminant. If this ratio increases, usually it results in a greater removal rate. Although, if the entrance of the liquid goes through the air flow, the result is a spike increase in the air pressure drop, causing what is called flooding. The usual pressure drop in the tower should be between 200 - 400 N/m^2.

A key aspect in the proper operation of every machine is its maintenance. In the case of packed column air strippers, this relates to the fouling of the packing material. Due to the size of the towers on column air strippers, it is difficult to clean the packing material. If the packing material is not cleaned frequently enough, mineral deposits like calcium will concentrate on the packing, reducing the surface area. This will result in a lowering of the mass transfer process, thus preventing an efficient stripping. Also, routine blower and pump maintenance is required for an optimum performance of the stripper.

Preliminary Results

The monthly rainfall at SRS from 1987 through 2012 was collected from the USGS and is plotted below in Figure 3. Data from wet and dry periods were compared to TCE and PCE monthly removal rates without any correlations obvious via simple inspection of the data.

Figure 3. Monthly Rainfall at SRS from 1987-2012.

TCE and PCE monthly recovery rates, as well as pumping flow rates for this period from SRS sources, had many months of missing data. SRS did have the total monthly removal rates of all wells combined for this period. FIU sifted through numerous historic site documents to identify missing data as well as specific months when specific wells were not operational.[5-14]

A significant amount of data was found in the following reports:

- 1990 M-Area Hazardous Waste Management Facility Post-Closure Care Permit Groundwater Monitoring and Corrective Action Program.
- Fourth Quarter 1992 and 1992 Summary M-Area Hazardous Waste Management Facility Groundwater Monitoring Report, Volume I.
- Fourth Quarter 1994 M-Area Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report.
- Third and Fourth Quarters 1995 M-Area Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report.

- Third and Fourth Quarters 1996 M-Area and Metallurgical Laboratory Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report, Volume I.
- Third and Fourth Quarters 1997 M-Area and Metallurgical Laboratory Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action, Volume I.
- Third and Fourth Quarters 1999 Annual M-Area and Metallurgical Laboratory Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report, Volume I and II.
- Annual 2010 M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Groundwater Monitoring and Corrective Action Report, Volume I.
- Annual 2011 M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Groundwater Monitoring and Corrective Action Report, Volume I.

This missing data and the months when wells were not operational have been added to an Excel file of all the contaminant recovery data and is included in this report as Appendix A.

The monthly removal rate and the cumulative mass removed for TCE and PCE in the 12 recovery wells (RWM-1 through RWM-12) are plotted on the next 6 pages. These plots use all of the monthly well data collected to date. For the several remaining months when wells were operating but for which there is still missing data, FIU will apportion the total recovery from 12 wells per month to each well according to its relative contribution to recovery rates prior to that month.

Figure 4. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-1.

Figure 5. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-2.

Figure 6. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-3.

Figure 7. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-4.

Figure 8. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-5.

Figure 9. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-6.

Figure 10. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-7.

Figure 11. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-8.

Figure 12. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-9.

Figure 13. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-10.

Figure 14. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-11.

Figure 15. TCE and PCE removed per month and cumulative from 1987-2012 for RWM-12.

Table 1. Comparison of Contaminant Removal 1987 to 2012

Well ID RWC-	TCE				PCE			
	Jan. '87 removal (kg/mo.)	Dec. '12 removal (kg/mo.)	Jan. '87 H_2O Intensity, kg/Mgal	Dec. '12 H_2O Intensity, kg/Mgal	Jan. '87 removal (kg/mo.)	Dec. '12 removal (kg/mo.)	Jan. '87 H_2O Intensity, kg/Mgal	Dec. '12 H_2O Intensity, kg/Mgal
1	389.00	10.57	243	26.9	161.35	58.76	101	149
2	89.09	3.00	98.2	3.24	29.43	8.68	32.4	9.39
3	341.37	8.94	116	3.89	66.55	7.53	22.7	3.27
11	180.52	2.18	69.6	.931	49.59	0.16	19.1	0.0665
4	12.96	19.64	23.1	10.0	0.00	8.13	0.00783	4.15
5	5.29	13.35	5.32	6.57	1.43	8.26	1.44	4.07
7	3.48	40.15	7.32	23.8	2.90	48.72	6.10	28.9
8	0.09	5.20	0.129	2.66	0.22	3.67	0.305	1.88
10	101.16	24.89	52.0	18.5	111.05	70.67	57.1	52.4
6	105.00	2.90	73.7	2.70	95.94	7.58	67.3	7.04
12	91.76	6.39	39.3	3.11	0.05	0.06	0.0196	0.03.13
9	3.77	1.73	3.23	9.08E-07	0.67	0.53	.571	.278

Discussion

The interesting features of TCE and PCE recovery for each well are discussed below as well as the trends, connections to remediation operations and contaminant mobility considerations.

For the RWM-1 recovery well (see Figure 4), PCE recovery significantly surpasses TCE recovery from early 2006 until Dec. 2012. This trend of more PCE than TCE recovery is seen in 7 of the 12 wells and will be the case in all wells by 2024 or soon thereafter. This is an expected phenomenon. TCE was used initially at SRS and replaced by PCE in the 1970's. TCE is more than 4 times as soluble in groundwater compared to PCE and it is also more volatile. For these reasons, TCE recovery dominates that of PCE for years before PCE recovery ultimately surpasses TCE. Data of monthly removal from each well is missing for 1988. The total removal of TCE and PCE from all wells combined is documented. FIU will apportion the amount removed in 1988 to these 12 wells based upon the removal rate immediately prior to the missing year.

The rate of recovery in this well and other wells were affected by steam injection remediation operations at SRS to remove source term and mobilize contaminants for removal. There were 2 remediation programs targeted to the M-Area Settling Basin area dense nonaqueous phase liquid (DNAPL) source which is not too distant from the area being treated by the M1 stripper and RWM-1 through RWM-12. The steam injection was part of a treatment process known as "dynamic underground stripping." The pilot-scale remediation removed 32 tons of DNAPL contamination during its year of operation ending in September 2001. The major steam injection remediation campaign began in August 2005 and ended September 2009. There are clear increases in TCE and PCE removal in this well during the months of steam injection. The heating of the ground to over 100°C by August 2009 has been cooling slowly since and will remain higher than background soil temperature for several more years. The TCE removal rate has dropped in RWM-1 to near its level in 2005 prior to the steam injection since much of the contaminant has been removed. The PCE removal rate is still well above its rate in 2005 prior to the steam injection.

In RWM-2 (see Figure 5), the pump was not operated from June 2000 through November 2003. The steam injection campaign from 2005-2009 did not enhance the mostly depleted TCE but did significantly enhance the PCE removal. The spike in TCE and PCE removal in many of the wells during October 2005 is not understood. It is speculated that it might be a calibration error from the lab analyses.

The TCE and PCE removal rates in well RWM-3 (see Figure 6) appear small in the graph above but its relative size is not small compared to other wells. It appears small due to the large scale for the Y-axis. Note that all graphs are scaled to display the highest monthly recovery rate as near full scale on the Y-axis.

The removal rate data for TCE and PCE in well RWM-4 (see Figure 7) for the year 1996 seems to have been switched. The TCE removal rate dropped by about a factor of 7, matching the PCE

removal data in 1995 and 1997. Similarly, the PCE removal rate increased by a factor of 7 to match the TCE data in 1995 and 1997.

There is a major increase in TCE and PCE removal in well RWM-6 (see Figure 9) for the year 2007 and a huge drop in recovery from 2008 to the present.

The recovery of TCE and PCE in well RWM-9 (Figure 12) shows a major increase beginning in 2002 and continuing to the present.

Recovery in RWM-10 (see Figure 13) had an enormous increase for both TCE and PCE in 2003 about 1 year after the pilot-scale remediation program ended. Since the recovery rates were so large (over 1000 kg per month) in 2003, the well was not operational from mid-2003 to mid-2007.

Recovery of TCE and PCE is very low since 2002 in well RWM-11 (see Figure 14).

The removal of TCE and PCE after 26 years is presented in Table 1.

Mass of contaminant removed per month in January 1987 is compared to that for December 2012. In addition, the mass of contaminant removed per 1000 gallons of water pumped are compared. Certain wells exhibited similar trends over the past 26 years; for example, wells 1, 2, 3, and 11 exhibit exponential decay in contaminant removal. Wells 4, 5, 7, 8, 10, and 13 exhibit steady concentrations. Wells 6 and 12 exhibit linear decreases and well 9 has a unique, anomalous trend. The Green and Sustainable Remediation analyses underway seem very relevant given the trends and inefficiencies in the current remediation system.

Overall, the process of data analysis and validation was as expected. Increased monthly recovery rates related to heating of the subsurface was expected as was the transition from more TCE recovered during the first 20 years to more PCE recovered than TCE after many years of pump and treat and source term reduction.

Conclusions

FIU has located missing data for many monthly recovery rates of TCE and PCE for recovery wells RWM-1 through RWM-12 and input the data into a more complete database. FIU searched through volumes of SRS documents to locate the data. The more complete monthly data for all wells allows for several types of analyses. The spatial and temporal removal rates can be correlated to spatial and temporal data of contaminant disposal (source locations) and remediation operations. Graphs for the monthly recovery of TCE and PCE were analyzed, showing the effects of remediation on removal rates. In Table 1 there is a comparison of the remediation progress over 26 years. More importantly, there are groups of wells that have contaminant removal that are decreasing exponentially and others are decreasing linearly and still others are somewhat constant. Finally, there is 1 well with anomalous results.

The pumping and overall electrical energy efficiency (per 1 pound of TCE removed and destroyed) has decreased to 6% of what it was during the initial year of operation. That is, it now requires 15.9 times more energy and groundwater to remove 1 pound of TCE in the 26th year of operation than it did in the first year of operation. The next phase of this project will identify options that will offer significant opportunities for improved efficiencies related to electrical energy, water usage, human labor, and the use of other resources.

Findings show that 7 of 12 recovery wells have transitioned to more PCE removal than TCE removal. This was an expected result. This is important to our GSR analyses and future remediation options since PCE is much more difficult to mobilize and remove due to its much lower solubility in water than TCE.

The injection of steam for 4 years as part of “dynamic underground stripping” remediation process was very successful in removing and destroying TCE and PCE in the nearby M Area settling basin area. The increased ground temperature has mobilized DNAPL and resulted in increased recovery in several of the RWM 1-12 wells at this nearby but separate DNAPL location. Soil temperatures have been cooling since steam injection ended in 2009 but the elevated temperatures will continue for another decade and continue to enhance removal of TCE and PCE.

FIU is developing a set of proposed actions for the existing infrastructure of the groundwater remediation system that will reduce the environmental burden of the A/M Area groundwater remediation system. A schedule of reduced hours of operation for the treatment system and specific component replacements for old, inefficient components are recommendations under analysis. The A/M Area groundwater remediation system has operated continuously for 27 years and is expected to operate continuously for the foreseeable future. Improvements in system performance, increased contaminant recovery, or decreased energy consumption, will have positive enduring benefits due to the long time frame over which the benefits will accrue. This work will directly support the Dept. of Energy EM-12/EM-13 Sustainable Remediation (SR) program and will be executed in coordination with the SR program lead. The effort is also referred to as “green and sustainable remediation (GSR)” or “green remediation” in the literature and in various implemented programs [10].

Mechanical Design of GSR Options

The improved understanding obtained from modeling and data analysis will allow GSR options for optimizing system effectiveness by modifying operational variables (e.g., pump rates from each well) and proposing system hardware modifications (e.g., improved packing material for column). There is more information in the next section (Future Work) on the analysis and modeling to optimize pumping and contaminant containment and removal efficiency. Below we discuss the optimization of air strippers which will allow us to propose design modifications and component improvements in order to best achieve system performance while ensuring site goals are met.

Optimization of Air Strippers

In order to provide a proper analysis and optimization for the M1 air stripper design and operation, one needs to focus on the goals for the stripper, e.g., the actual treatment goal (which is never 100% efficiency in removal of all contaminants). Design and operational parameters such as: the air to water ratio (which is defined by Henry's constant); the water temperature; the inlet concentration and desired outlet concentration of the contaminants; the diameter of the tower; the flow rate; the current packing material; the power of the blower; the discharge pump power; the head pressure; the height of the tower; and the use of other ancillary equipment, all affect the effectiveness of the stripping process. A very important factor in tower air stripping is the packing material. One of the benefits of tower air strippers is the low energy usage due to the low overall pressure drop but a huge disadvantage is the fouling of the packing material. For minimizing operating costs of the stripping, the air flow rate is the most important factor, and is mainly affected by blower power consumption.

The removal efficiency of contaminants by packed towers involves many parameters. Economic considerations determine a desired balance between the volume of the tower and the air-to-water ratio as a function of pressure drop and the packing. Because the tower volume affects the costs of the process, minimizing the volume of the tower at a pressure drop to reduce energy consumption is one way to optimize the process in the design of the stripper. In any given application, the most favorable liquid rate packing height, and air-to-water ratio will depend on specific characteristics of the site's water quality, the required and ideal efficiency, and economic considerations. The site stakeholders would be briefed on the complex interdependence of the acceptable window of operating conditions, design modifications and system performance. In Table 2, different parameters are modified and the effects on the operations and cost are shown (assuming no changes in the tower design), as well as the effects on the tower design (assuming no change in removal efficiency). For example, for a given tower design (keeping the packing, diameter and height fixed), by increasing the water pumping rate to meet water demands, liquid loading will increase. This causes a decrease in the air-to-water ratio, resulting in a decrease in removal efficiency and an increase in operating costs due to the greater volume of air required to meet the target removal efficiency.[15]

Table 2. Parameters Important to Packed Tower Design

Parameter	Effect of Increasing (↑) Parameter on Operations and Cost, Assuming no Change in Tower Design	Effect of Increasing (↑) Parameter on Tower Design, Assuming Removal Efficiency is Maintained
Liquid Loading Rate	↓ Removal Efficiency ↑ Cost	↑ Tower Height (HTU)
Air/Water Ratio (AWR)	↑ Removal Efficiency ↑ Cost	↓ Packing Volume
Water Temperature	↑ Removal Efficiency ↑ Heating Cost ↑ Henry's Constant	↓ Packing Volume
Henry's Constant	↑ Removal Efficiency	↓ Packing Volume ↓ AWR
Packing Type and Size	↑ the Size ↓ Removal Efficiency	↑ the Size ↑ Packing Volume ↓ Pressure Drop
Pressure Drop / Depth	↑ Removal Efficiency ↑ Pump/Blower Cost	↑ AWR

Pumping rates, packing material, and air blower design and operation will all be analyzed as part of the mechanical design optimization studies.

Future Work

Current influent concentrations will be used with published design guidelines for air strippers to determine the minimum air flow rate that would meet treatment specifications. A new blower strategy will be recommended based on the outcome of the air stripper analysis. In particular, it will allow for correlations between hydraulic flow rates and contaminant mass flow rates, and between airflow rates and contaminant removal rates.

Detailed baseline mass flow charts for each well, loading rates, removal efficiencies, as function of time are shown earlier in this report. Statistical analysis of the baseline data allows for the development of correlations between system performance and operating parameters. Excel, OCTAVE, R, and analytical and numerical tools for data analysis, well drawdown calculations and system optimization will be performed.

Understanding these correlations, energy efficiencies and remediation system efficiency, and working with key SRS stakeholders, will allow FIU and SRNL to propose performance metrics for the operation of each well and for the entire system and propose performance targets. These metrics will permit analyses to evaluate potential areas of improvement based on the proposed performance targets and based on the statistical correlations.

The next steps include:

- Analyze design basis, system performance and “As-Built” diagrams of current air stripper system components (upon receipt);
- Investigate operational strategies to increase system performance by optimizing the hydraulic loads, pumping rates, contaminant mass flow rates and well drawdown levels;
- Determine a set of metrics which will correlate the pumping rates, the cone of depression, and the interaction between the wells with the contaminant mass flow rates;
- Determine the best set of operating parameters that will ensure overall steady increase of performance between the optimal well pumping rates and greatest mass flow rates of contaminants; and
- Propose air stripper design improvements that would allow for exchange of improved components that would enhance overall system performance.

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Appendix A

minutes in Jan. 44640 in Feb. 40320 in Apr. 43200

TCE Removed (kg/month)

Month	Rainfall (in)	TCE Monthly RWM-1	TCE Cumulative RWM-1 (cumulative)	TCE Monthly RWM-2	TCE Cumulative RWM-2 (cumulative)	TCE Monthly RWM-3	TCE Cumulative RWM-3 (cumulative)	TCE Monthly RWM-4	TCE Cumulative RWM-4 (cumulative)	TCE Monthly RWM-5	TCE Cumulative RWM-5 (cumulative)	TCE Monthly RWM-6	TCE Cumulative RWM-6 (cumulative)	RWM-7	TCE Cumulative RWM-7 (cumulative)	TCE Monthly RWM-8	TCE Cumulative RWM-8 (cumulative)	TCE Monthly RWM-9	TCE Cumulative RWM-9 (cumulative)	TCE Monthly RWM-10	TCE Cumulative RWM-10 (cumulative)	TCE Monthly RWM-11	TCE Cumulative RWM-11 (cumulative)	TCE Monthly RWM-12	TCE Cumulative RWM-12 (cumulative)	RWM-13b	RWM-13c	RWM-14b	RWM-14c	RWM-15b	RWM-17b	all wells /mo.	all wells accum.
Jan-87	7.06	388.9984703	388.9984703	89.09407043	89.09407043	341.3666944	341.3666944	12.96436198	12.96436198	5.287160924	5.287160924	105.0037259	105.0037259	3.476882999	3.476882999	0.094824082	0.094824082	3.769637562	3.769637562	101.1625899	101.1625899	180.5207119	180.5207119		0							2463.478261	2463.478261
Feb-87	8.01	400.2076789	789.2061492	43.06804998	132.1621204	278.9270731	620.2937675	3.633532753	16.59789474	1.293110186	6.580271109	137.8177599	242.8214858	6.599900038	10.07678304	0.067479894	0.162303976	0.253431276	4.023068838	21.46914048	122.6317304	106.2579326	286.7786445		0							3230.929309	5694.407569
Mar-87	4.33	384.3671337	1173.573283	64.65278304	196.8149034	534.4630064	1154.756774	11.41945627	28.017351	11.52763347	18.10790458	266.1328285	508.9543143	17.02269746	27.0994805	0.116290496	0.278594472	2.171488376	6.194557213	61.61029913	184.2420295	197.761454	484.5400984		0							5333.824361	11028.23193
Apr-87	0.81	347.9227565	1521.496039	101.8414237	298.6563271	439.687997	1594.444771	13.39674366	41.41409466	11.51236653	29.62027111	159.0597501	668.0104644	10.95294207	38.05242257	0.100598258	0.37919273	2.045661492	8.240218705	57.19379023	241.4358198	183.5304809	668.0705793		0							6437.068311	17465.30024
May-87	4.14	314.8970844	1836.393124	98.54267323	397.1990004	379.7019917	1974.146763	8.473317683	49.88741234	20.20547368	49.82574479	150.7212722	818.7353366	9.208584627	47.26100719	0.021804468	0.400997198	3.256471942	11.49669065	74.84510413	316.2809239	73.83094282	741.9015222		0							7377.233243	24842.53348
Jun-87	5.19	310.4805755	2146.873699	106.0943582	503.2933586	366.6029534	2340.749716	9.91260886	59.8000212	10.40987505	60.23561984	158.9616055	977.6969421	9.225596365	56.48660356	0.067065505	0.468062704	1.684489209	13.18117986	63.08246876	379.3633927	177.6418023	919.5433245		0							8671.855319	33514.3888
Jul-87	4.61	219.3630897	2366.236789	93.30283983	596.5961984	314.6604468	2655.410163	6.794880727	66.59490193	11.78962514	72.02524498	177.748671	1155.445613	9.46550549	65.95210905	0.10141613	0.569478834	2.300117834	15.48129769	84.42892844	463.7923211	150.0958728	1069.639197		0							9597.794708	43112.18351
Aug-87	3.21	141.2219614	2507.45875	88.73911397	685.3353124	361.4470882	3016.857251	2.319048845	68.91395078	0	72.02524498	146.0730329	1301.518646	8.960115108	74.91222416	0.121699356	0.69117819	1.98031897	17.46161666	117.1356304	580.9279515	139.9542598	1209.593457		0							10543.64785	53655.83136
Sep-87	4.05	218.8625521	2726.321303	112.4574025	797.7927149	438.3794017	3455.236653	2.237697842	71.15164862	1.568678531	73.59392351	164.0651268	1465.583773	12.2206437	87.13286785	0.126606588	0.817784778	2.075432033	19.53704869	25.87338129	606.8013328	149.1798561	1358.773313		0							11789.78914	65445.6205
Oct-87	0.37	364.1244741	3090.445777	126.6433927	924.4361075	445.3478076	3900.58446	10.4627641	81.61441272	1.470533889	75.0644574	139.9897554	1605.573528	14.42644453	101.5593124	0.152124195	0.969908974	2.934306702	22.4713554	63.62594472	670.4272775	140.3599243	1499.133237		0							13281.81731	78727.43781
Nov-87	2.75	330.9110186	3421.356795	110.0037864	1034.439894	343.3753881	4243.959849	2.829837183	84.44424991	1.491798561	76.55625596	142.3097312	1747.883259	11.47965165	113.0389964	0.127588035	1.097497009	3.364725483	25.83608088	50.2500568	720.6773343	107.386596	1606.519833		0							14179.34019	92906.778
Dec-87	1.26	299.9889133	3721.345708	120.1781144	1154.618008	318.6156759	4562.575524	2.459341159	86.90359106	1.237276789	77.79353275	165.6463461	1913.529605	10.09090496	123.129869	0.115952442	1.213449451	2.295047028	28.13112791	149.0817115	869.7590458	116.6454525	1723.165286		0							15448.51948	108355.2975
Jan-88	4.47	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	122617.4622
Feb-88	1.81	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	136879.627
Mar-88	2.62	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	151141.7917
Apr-88	4.08	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	165403.9565
May-88	1.2	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	179666.1212
Jun-88	6.85	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	193928.286
Jul-88	3.51	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	208190.4507
Aug-88	6.89	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	222452.6155
Sep-88	4.58	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	236714.7802
Oct-88	3.35	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	250976.945
Nov-88	2.09	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	265239.1097
Dec-88	1.81	0	3721.345708	0	1154.618008	0	4562.575524	0	86.90359106	0	77.79353275	0	1913.529605	0	123.129869	0	1.213449451	0	28.13112791	0	869.7590458	0	1723.165286		0							14262.16475	279501.2745
Jan-89	1.4	19.94517228	3741.290881	120.8542219	1275.47223	314.7956683	4877.371193	56.80148429	143.7050754	1.739286634	79.53281939	16.66605074	1930.195656	2.450889814	125.5807588	0.540886028	1.754335479	3.367015524	31.49814343	45.73867474	915.4977206	79.43418402	1802.59947		0							15586.83182	295088.1063
Feb-89	2.53	25.46526316	3766.756144	91.98333964	1367.45557	245.8588716	5123.230064	31.97356153	175.6786369	1.209141992	80.74196138	65.22405028	1995.419706	2.068670958	127.6494298	0.563350246	2.317685725	2.93476471	34.43290814	36.09105642	951.588777	37.21317683	1839.812647		0							16005.66878	311093.7751
Mar-89	5.29	5.273638773	3772.029783	134.2749565	1501.730526	326.1035668	5449.333631	46.46718061	222.1458175	1.757879591	82.49984097	109.02234	2104.442046	23.57756002	151.2269898	0.589565771	2.907251496	3.876800606	38.30970875	67.34031049	1018.929087	88.77291935	1928.585566		0							17079.19697	328172.972
Apr-89	4.61	5.103521393	3777.133304	112.6700492	1614.400576	286.6314275	5735.965059	58.6152518	280.7610693	1.34131011	83.84115108	179.931844	2284.37389	12.8373192	164.064309	0.599173041	3.506424536	2.051877319	40.36158607	46.81499432	1065.744082	59.11578947	1987.701356		0							17803.56536	345976.5374
May-89	3.33	11.15577433	3788.289078	95.246649	1709.647225	233.2570996	5969.222158	45.56288679	326.3239561	1.056418023	84.8975691	57.84268989	2342.21658	15.92909353	179.9934025	0.700109353	4.206533889	2.915375691	43.27696176	32.8588262	1098.602908	77.01709958	2064.718455		0							18184.93685	364161.4742
Jun-89	8.07	21.59182128	3809.8809	130.565089	1840.212314	294.7283605	6263.950519	44.12583112	370.4497872	1.858205225	86.75577433	77.31180613	2419.528387	19.30177963	199.2951821	0.863672851	5.07020674	2.88692465	46.16388641	41.90776221	1140.51067	65.92048466	2130.63894		0							19013.5183	383174.9925
Jul-89	9.25	245.6298675	4055.510767	109.8674744	1950.079788	230.9245286	6494.875047	65.64159031	436.0913775	3.623936388	90.37971072	126.8377736	2546.36616	15.97642105	215.2716032	0.982046195	6.052252934	1.64294131	47.80682772	72.20828474	1212.718955	58.66923135	2189.308171		0							20176.46476	403351.4573
Aug-89	2.66	144.9574555	4200.468223	122.1219235	2072.201711	282.9510034	6777.826051	56.29947444	492.390852	1.415600151	91.79531087	101.0780765	2647.444237	14.36221431	229.6338175	0.714645665	6.766898599	1.525974707	49.33280242	42.18911019	1254.908065	60.42711094	2249.735282		0							20900.54584	424252.0031
Sep-89	5.37	203.7482772	4404.2165	100.0748201	2172.276532	230.5417645	7008.367815	45.62417266	538.0150246	1.284059069	93.07936994	79.18964029	2726.633877	13.00743658	242.6412541	0.761438849	7.528337448	0.727578947	50.06038137	38.27641045	1293.184476	48.16448315	2297.899765		0							21595.30341	445847.3066
Oct-89	2.65	253.9121848	4658.128685	126.161666	2298.438198	212.8318364	7131.199652	50.9007557	588.9157804	1.967472927	95.04684286	73.29850814	2799.932385	13.58300038	256.2242544	0.709912912	8.23825036	0.887053086	50.94743446	43.50751988	1336.691995	56.03241197	2353.932177		0							22321.48798	468168.7945
Nov-89	2.98	249.9907611	4908.119446	108.351685	2406.789883	240.552518	7371.75217	67.32722454	656.2438049	1.406739871	96.45358273	157.0314275	2956.963812	12.71954563	268.9438001	1.479366906	9.717617266	0.717110186	51.66454464	102.0704279	1438.762423	52.41741764	2406.349595		0							23565.8241	491734.6186
Dec-89	4.59	241.37039	5149.489836	112.3521696	2519.142052	229.0652329	7600.817402	54.33200151	710.5750064	1.00401969	97.45760242	90.51389625	3047.477709	16.40067853	285.3444786	1.176934192	10.89455146	0.929478834	52.59402348	52.73638773	1491.498811	54.05479743	2460.404392		0							24279.63185	516014.2505
Jan-90	2.8	107.7039303	5257.193766	111.1858841	2630.327936	245.9341159	7846.751518	48.34168875	758.9166952	8.199494131	105.6570966	12.3558652	3059.833574	16.17587278	301.5203514	0.432708822	11.32726028	3.016284741	55.61030822	0	1491.498811	0	2460.404392		0							24532.38755	540546.638
Feb-90	2.41	184.6231579	5441.816924	84.62467247	2714.952609	217.6455585	8064.397077	34.43306626	793.3497615	2.821331314	108.4784279	62.89461992	3122.728194	6.619747066	308.1400984	0.438161303	11.76542158	1.311277849	56.92158607	0	1491.498811	0	2460.404392		0							25169.86489	565716.5029
Mar-90	2.89	50.97850814	5492.795432	128.6801666	2843.632775	337.157925	8401.555002	54.00239909	847.3521605	8.437822037	116.9162499	122.1050208	3244.833215	12.74462704	320.8847255	0.479022189	12.24444377	1.649702385	58.57128845	0	1491.498811	0	2460.404392		0							26006.92369	591723.4266
Apr-90	1	252.0354411	5744.830873	112.1138963	2955.746672	235.5471412	8637.102143	21.14035593	868.4925165	12.02271867	128.9389686	93.23741007	3338.070625	19.67472927	340.5594548	1.720148429	13.9645922	0.942188565	59.51347702	8.456796668	1499.955608	60.39166982	2520.796062		0							26925.25349	618648.6801
May-90	3.35	91.40973874	5836.240612	100.7738281	3056.5205	135.5257554	8772.627899	15.51666793	884.0091844	14.41461265	143.3535812	74.8248209	3412.895446	12.12936918	352.6888239	0.151617115	14.11620931	0.007268156	59.52074517	36.71263915	1536.668247	39.77202575	2560.568088		0							27150.44768	645799.1278
Jun-90	4.78	154.6268838	5990.867496	109.1368421	3165.657342	280.6936766	9053.321575	51.25113215	935.2603165	12.43165468	155.7852359	81.31937902	3494.214825	32.44334722	385.1321711	1.845119273	15.96132859	0.770108292	60.29085346	32.19144264	1568.85969	52.73638773	2613.304476		0							28248.10128	674047.2291
Jul-90	7.45	204.9112912	6195.778787	116.4257175	3282.083059	128.2068913	9181.528466	44.3526543	979.6129708	10.77039303	166.5556289	75.35218478	3569.567009	11.94682014	397.0789913	1.551666793	17.51299538	0.920351382	61.21120485	11.55129724	1580.410987	45.75895797	2659.063434		0							28742.15176	702789.3808
Aug-90	6.05	252.5599697	6448.338757	113.1804014	3395.263461	116.020053	9297.54852	48.5833972	1028.196368	10.53206513	177.0876941	60.72966906	3630.296679	3.820007573	400.8989989	17.74106172	35.2540571	0.863051268	62.07425612	19.02566604	1599.436653	51.74758046	2710.811014		0							29480.00938	732269.3902
Sep-90	0.7	192.5925028	6640.931259	170.9352518	3566.198713	221.087164	9518.635683	51.84327149	1080.03964	18.11750095	195.205195	260.0833018	3890.37998	11.49928058	412.3982794	0.964434684	36.21849178	2.513157137	64.58741325	0	1599.436653	59.00946611	2769.82048		0							30762.49712	763031.8873
Oct-90	17.56	201.4631427	6842.394402	98.35674366	3664.555456	176.5147747	9695.150458	48.28421961	1128.323859	12.35248466	207.5576797	78.61778417	3968.997764	28.89852632	441.2968058	2.500245665	38.71873745	1.136029686	65.72344294	63.99357819	1663.430231	52.62652026	2822.447		0							31303.33989	794335.2272
Nov-90	1.5	192.3634987	7034.757901	101.9559258	3766.511382	169.8556607	9865.006119	48.75825824	1177.082117	13.92672473	221.4844044	70.3942446	4039.392009	26.43362363	467.7304294	2.539165468	41.25790292	1.20276259	66.92620553	33.46732298	1696.897554	52.20477092	2874.651771		0							31964.79975	826300.027
Dec-90	1.63	211.5540477	7246.311949	101.8556002	3868.366982	186.9099281	10051.91605	48.45155623	1225.533674	13.30072548	234.7851299	80.83541689	4120.227426	29.88395305	497.6143824	3.023552897	44.28145581	1.232205983	68.15841151	29.71492616	1726.61248	48.12195381	2922.773725		0							32761.46553	859061.4925
Jan-91	7.65	191.6764862	7437.988435	114.2959788	3982.662961	174.9090193	10226.82507	50.51368421	1276.047358	12.61278607	247.3979159	87.06574782	4207.293174	11.95020068	509.5645831	3.982273381	48.26372919	0.937592124	69.09600363	25.84082999	1752.45331	46.46887088	2969.242596		0							33447.0886	892508.5811
Feb-91	1.49	183.8445437	7621.832978	64.25856872	4046.92153	149.6923892	10376.51746	45.75655888	1321.803917	11.89294964	259.2908656	72.00501628	4279.29819	24.45764483	534.0222279	2.974000757	51.23772995	1.20135585	70.29735949	26.03319349	1778.486504	41.08640061	3010.328997		0							33973.24038	926481.8215
Mar-91	8.17	172.2721999	7794.105178	92.52531617	4139.446846	168.3507762	10544.86823	50.15027641	1371.954193	13.907532	273.1983976	81.36954184	4360.667732	33.06165846	567.8838864	4.353625445	55.59135514	1.498423324	71.79578281	26.89555774	1805.382061	51.60052707	3061.929524		0							34742.00862	961223.8301
Apr-91	4.05	115.2545248	7909.359703	95.5601666	4235.007012	161.6442257	10706.51246	44.31884892	1416.273042	12.30733813	285.5057357	59.48546763	4420.1532	52.51859144	599.6024778	3.159603181	58.75095858	1.301725104	73.09750791	19.30832261	1824.690384	44.17817493	3106.107699		0							35224.09717	996447.9273
May-91	2.83	156.7724347	8066.132138	97.96798183	4332.974994	183.5631958	10890.07565	45.86544491	1462.138487	14.05627565	299.5620114	87.54578417	4507.698984	36.91547141	636.5179493	4.849043241	63.60000182	1.483210905	74.58071882	24.90780159	1849.598186	51.38413266	3157.491871		0							36045.68181	1032493.609
Jun-91	2.2	223.4753502	8289.607488	99.69859902	4432.673593	152.7457781	11042.82143	42.61931087	1504.757798	13.71571374	313.2777251	69.2574025	4576.956386	33.1074593	669.6254086	4.455112457	68.05511427	1.339674366	75.92039318	30.83377509	1880.431961	45.1203635	3202.612235		0							36773.10807	1069266.717
Jul-91	8.96	197.6093298	8487.216818	86.30512685	4518.97872	158.9697842	11201.79122	52.87837031	1557.636168	12.42009542	325.6978205	77.74222491	4654.698611	30.85078682	700.4761954	5.036832109	73.09194638	1.346299129	77.26669231	34.81446725	1915.246428	37.25859599	3239.870831		0							37447.20336	1106713.921
Aug-91	10.06	182.0926619	8669.30948	68.42208254	4587.400803	151.5833094	11353.37452	50.72158728	1608.357755	13.1587429	338.8565634	84.11453843	4738.81315	35.79482317	736.2710186	5.538334873	78.63028126	1.178962514	78.44565483	24.84695191	1940.09338	48.8436986	3288.714529		0							38084.56283	1144798.483
Sep-91	4.81	223.0500568	8892.359537	100.4510413	4687.851844	165.7990155	11519.17354	43.18691405	1651.544669	16.70912533	355.5656888	97.097766	4835.910916	37.22135555	773.4923741	7.969344945	86.5996262	1.101182885	79.54683771	36.86967058	1976.96305	44.20271109	3332.91724		0							38965.58351	1183764.067
Oct-91	0.61	145.2955093	9037.655046	76.26492995	4764.116774	151.1100341	11670.28357	47.46274896	1699.007418	15.00072018	370.5564089	84.88530102	4920.796217	36.57741764	810.0669717	5.552531131	92.15215933	1.057432185	80.6042669	24.08633094	2001.049381	46.51619841	3379.433439		0							39459.72363	1223223.79
Nov-91	1.78	83.78280954	9121.437855	70.70314427	4808.887088	111.0015903	11781.28359	48.02268255	1747.029641	11.70374858	382.3601575	131.4647487	5052.260965	25.27655676	835.3463385	4.754226467	96.9062858	0.957581901	81.18208918	24.06045045	2025.816182	36.63690784	3408.07041		0							39864.88708	1263082.288
Dec-91	3.44	116.8313821	9238.269237	66.52898145	4875.41607	133.0072548	11914.29242	44.11601666	1791.726298	13.98190382	396.3420613	63.28366528	5115.544634	34.81953805	874.1658766	4.707736766	101.6140226	1.76497872	82.94503052	25.94731693	2051.763499	39.44242232	3447.512833		0							40434.02317	1303522.311
Jan-92	4.34	146.0392276	9384.308465	86.00087846	4961.416948	120.9128742	12035.20529	42.21446422	1833.940762	13.42580538	409.7678667	64.50065884	5180.045289	41.85105642	916.016933	4.849043241	106.4630658	0.723097009	83.66812753	22.4991685	2074.262667	38.34374858	3485.856582		0							41052.31202	1344574.623
Feb-92	5.26	104.2884968	9488.596962	61.92272624	5023.339674	105.2350473	12140.44034	35.24374101	1869.184503	10.54793184	420.3157986	56.33502461	5236.380314	28.51865203	944.5355875	5.226180386	111.6892462	0.695256645	84.36338417	25.16603105	2099.428698	31.06059826	3516.91718		0							41399.43137	1385974.054
Mar-92	3.34	164.3617418	9652.958704	84.37822037	5107.717895	120.6344869	12261.07483	43.73570617	1912.920209	13.29869716	433.6144957	67.0360621	5303.416376	34.48148429	979.0170693	5.867937296	117.5571835	0.878601742	85.24198591	25.48925407	2124.917952	39.33255585	3556.249736	91.75827217	91.75827217							42317.69773	1428291.752
Apr-92	2.7	145.3031427	9798.261846	73.01961378	5180.737509	105.0147671	12366.0896	42.75180613	1955.672015	20.14664142	453.7611371	15.31115487	5374.76753	36.10741386	1015.144843	5.642662628	123.1998461	0.765528209	86.00751412	28.11353275	2153.031485	28.26565695	3584.515393	20.4882393	112.2465115							42780.38503	1471072.137
May-92	2.72	187.4170087	9985.678855	108.7180916	5289.4556	166.3224536	12532.41205	65.96781219	2021.639827	20.68889057	474.4500277	107.5010981	5482.268629	52.0112624	1067.135746	8.552760318	131.7526064	0.99641348	87.0039276	48.79130027	2201.822785	44.13629989	3628.651693	30.12059069	142.3671022							43885.86283	1514958
Jun-92	7.26	161.693298	10147.37215	65.16804241	5354.623643	94.7095797	12627.12163	42.1040515	2063.743879	12.26808027	486.718108	68.01423703	5550.282866	35.78844377	1102.924189	5.988131768	137.7407382	0.603589549	87.60751715	30.11568345	2231.938469	20.41408557	3649.065778	19.34267323	161.7097754							44157.05864	1559115.058
Jul-92	3.08	213.5823703	10360.95452	124.1333434	5478.756986	170.3790988	12797.50073	51.41797804	2115.161857	4.120875426	490.8389834	81.53856872	5631.821434	45.43442635	1148.358616	6.068741234	143.8094794	1.119634078	88.72715123	41.92542825	2273.863897	46.80354411	3695.869322	1.697029913	163.4068053							45177.29082	1604292.349
Aug-92	5.73	179.591064	10540.54559	116.4257175	5595.182704	130.6408785	12928.14161	63.1416827	2178.30354	12.44037864	503.2793621	90.26035593	5722.08179	47.59458993	1195.953206	6.024118137	149.8335976	1.436052404	90.16320363	35.86074366	2309.724641	42.47645589	3738.345778	20.8720939	184.2889992							45882.59804	1650174.947
Sep-92	7.45	163.1654676	10703.71105	83.61923514	5678.801939	187.7834154	13115.92502	74.8516471	2253.155187	11.51236653	514.7917286	28.18059826	5750.262388	41.97646346	1237.929669	9.428428626	159.2620262	1.279806134	91.44300977	39.65697842	2349.381619	42.93828095	3781.284059	25.47235138	209.7512506							46555.56399	1696730.511
Oct-92	2.83	135.221507	10838.93256	0	5678.801939	103.4343112	13219.35933	36.2816206	2289.436807	14.53969254	529.3314211	78.29325256	5828.555641	37.45635744	1275.386027	6.57176524	165.8337914	1.168313821	92.61132359	43.35877622	2392.740395	43.44328966	3824.727349	25.3793866	235.1306372							46895.9955	1743626.507
Nov-92	7.73	153.7599394	10992.6925	0	5678.801939	155.9845513	13375.34388	56.38409693	2345.820904	56.32799697	545.6594181	78.22127982	5906.776521	44.49223779	1319.878264	7.876107535	173.709899	1.813712988	94.42503658	46.16723968	2438.907635	38.20934495	3862.936694	22.10708065	257.2377178							47613.5344	1791240.041
Dec-92	3.78	169.9734343	11162.66594	0	5678.801939	112.9606664	13488.30455	48.98399091	2394.804895	16.56125407	562.2206722	48.88257478	5955.659496	41.37778114	1361.256045	11.41100492	185.1209039	1.898509958	96.32354654	44.43716774	2483.344803	36.3627535	3899.299447	24.46157062	281.6992885							48106.81223	1839346.853
Jan-93	8.85	146.8505566	11309.51649	50.20098448	5729.002923	136.3032791	13624.60783	49.06005301	2443.864948	13.37340704	575.5940792	59.7679061	6015.427402	57.32546763	1418.581513	7.301961378	192.4228653	1.507381749	97.83092828	40.13374328	2523.478546	38.16288981	3937.462337	16.03683453	297.736123						0	48781.55045	1888128.404

Month	Rainfall (in)	TCE Monthly RWM-1	TCE Cumulative RWM-1 (cumulative)	TCE Monthly RWM-2	TCE Cumulative RWM-2 (cumulative)	TCE Monthly RWM-3	TCE Cumulative RWM-3 (cumulative)	TCE Monthly RWM-4	TCE Cumulative RWM-4 (cumulative)	TCE Monthly RWM-5	TCE Cumulative RWM-5 (cumulative)	TCE Monthly RWM-6	TCE Cumulative RWM-6 (cumulative)	TCE Monthly RWM-7	TCE Cumulative RWM-7 (cumulative)	TCE Monthly RWM-8	TCE Cumulative RWM-8 (cumulative)	TCE Monthly RWM-9	TCE Cumulative RWM-9 (cumulative)	TCE Monthly RWM-10	TCE Cumulative RWM-10 (cumulative)	TCE Monthly RWM-11	TCE Cumulative RWM-11 (cumulative)	TCE Monthly RWM-12	TCE Cumulative RWM-12 (cumulative)	RWM-13b	RWM-13c	RWM-14b	RWM-14c	RWM-15b	RWM-17b	all wells /mo.	all wells accum.
Jun-95	8.57	75.83309353	13938.56255	40.25566073	7171.264067	100.9973798	15779.2078	60.37858387	3470.034139	9.677061719	813.429381	0	7291.380486	42.54570239	2401.192639	6.972195381	327.4712288	0	113.2890366	21.64580083	3135.905148	24.03562287	4563.9448	15.8274593	808.5895633						0	60212.4394	3489457.691
Jul-95	5.7	97.02143128	14035.58398	48.20646725	7219.470534	91.95062476	15871.15843	49.49107156	3519.52521	8.085908065	821.5152891	0	7291.380486	51.26585384	2452.458493	6.577850208	334.049079	0	113.2890366	24.33987126	3160.245019	21.76559182	4585.710392	19.31723741	827.9068008						0	60650.31466	3550108.006
Aug-95	5.88	0	14035.58398	0	7219.470534	0	15871.15843	0	3519.52521	0	821.5152891	0	7291.380486	0	2452.458493	0	334.049079	0	113.2890366	0	3160.245019	0	4585.710392	0	827.9068008						0	60232.29275	3610340.299
Sep-95	4.3	77.53426732	14113.11825	57.93805377	7277.408588	51.60445286	15922.76288	63.63044301	3583.155653	5.851056418	827.3663455	87.56137827	7378.941864	43.72670958	2496.185203	14.4272624	348.4763414	0.041999364	113.3310359	36.11722832	3196.362248	9.187319955	4594.897712	20.45225293	848.3590537						0	61168.4376	3671508.736
Oct-95	2.92	79.64546763	14192.76372	204.0999621	7481.50855	175.1456569	16097.90854	55.25150776	3638.407161	5.914588716	833.2809342	108.8786672	7487.820532	9.147734949	2505.332938	8.89926543	357.3756068	0.0861361	113.417172	25.90844074	3222.270688	46.85425218	4641.751964	39.68582204	888.0448757						0	62219.40018	3733728.137
Nov-95	2.6	102.2503597	14295.01408	61.70026505	7543.208815	67.90627793	16235.08891	63.51921242	3701.926373	8.872275653	842.1532098	63.20514956	7551.025681	28.37361605	2533.706554	6.816145399	364.1917522	0.138220371	113.5553924	24.83059447	3247.101283	15.54611132	4657.298076	18.0193563	906.0642232						0	62382.23784	3796110.375
Dec-95	4.03	79.00316547	14374.01724	0	7543.208815	69.1945354	16235.00895	53.33812344	3755.264497	10.02160394	852.1748138	53.83506248	7604.860744	33.0870125	2566.793566	9.719045816	373.9109798	0.27745763	113.83285	42.48490723	3289.58619	18.01150473	4675.30958	0	906.0642232						0	62659.0051	3858769.38
Jan-96	3.96	83.66830746	14457.68555	0	7543.208815	72.54295797	16307.55231	5.333812344	3760.598309	10.68418932	862.8590031	0	7604.860744	43.42300644	2610.216573	7.56057251	381.4713705	0.287345702	114.1201957	46.47563196	3336.061822	18.38505415	4693.694634	0	906.0642232	0	0	0	0	0	0	62866.75443	3921636.134
Feb-96	1.92	50.56411965	14508.24967	0	7543.208815	58.53041121	16366.08272	4.816720939	3765.41503	4.293980765	867.1529839	0	7604.860744	47.29088679	2657.507459	7.233478228	388.7048448	0.295538054	114.3797338	45.53335858	3401.595181	16.94630822	4710.640943	0	906.0642232	0	0	0	0	0	0	63089.33116	3984725.465
Mar-96	5.99	87.03194245	14595.28161	0	7543.208815	65.63313896	16431.71586	5.027366604	3770.442397	7.122792881	874.2757768	0	7604.860744	56.61893525	2714.126395	7.705259523	396.4101083	0.287683756	114.6674176	69.34834987	3470.94353	13.34805301	4723.988996	0	906.0642232	0.340758198	0.577395835	0.397551231	0.359689209	0.227172132	0	63460.01197	4048185.477
Apr-96	1.39	74.63900038	14669.92061	0	7543.208815	49.93108671	16481.64694	4.608708822	3775.051105	4.946489966	879.2222667	64.51374479	7669.374488	46.99819765	2761.124592	6.146308217	402.5564165	0.229004165	114.8964217	42.39194245	3513.335473	13.19063991	4737.179636	14.12192351	920.1861555	0	0	0	0	0	0	63789.41997	4111974.897
May-96	0.97	64.87251799	14734.79313	0	7543.208815	58.4494964	16540.09644	5.517037486	3780.568143	7.667059447	886.8893262	47.67639894	7717.050887	53.34488451	2814.469477	8.366830746	410.9232473	0.323010375	115.2194321	65.07873078	3578.414204	19.2284983	4756.408134	20.06687164	940.2530272	0.388085725	0.653119879	0.454344264	0.416482242	0.255568648	0	64171.0532	4176145.95
Jun-96	2.04	77.5669822	14812.36011	0	7543.208815	48.43438092	16588.53082	3.336917834	3783.905061	10.75665278	897.6459789	46.56963271	7763.62052	0	2814.469477	7.65528209	418.5785293	0.351684968	115.5711171	65.43794017	3643.852144	19.12511927	4775.533253	0	940.2530272	0.161775085	0.270879212	0.258611132	0.173061719	0.023718289	0	64377.65149	4240523.602
Jul-96	4.72	62.37092011	14874.73103	0	7543.208815	29.6642181	16618.19504	2.692936312	3786.597997	4.916653995	902.5626329	32.08130254	7795.701823	0	2814.469477	3.339126089	421.9176554	0.248469519	115.8195866	40.88760318	3684.739747	8.427511397	4783.960765	0	940.2530272	1.732525559	0	0	0	0	0	64468.51886	4304992.121
Aug-96	4.44	61.77932601	14936.51036	0	7543.208815	40.31291178	16658.50795	4.348723665	3790.946721	7.796872094	910.359505	37.88061492	7833.582438	0	2814.469477	0	421.9176554	0.339575009	116.1591616	49.07864597	3733.813893	15.91726164	4799.878026	0	940.2530272	0.346505112	0	0	0	0	0	64717.41196	4369709.533
Sep-96	4.1	82.6705036	15019.18086	0	7543.208815	29.3596971	16687.86792	4.428286255	3795.375007	9.500401363	919.8599064	37.55668307	7871.139121	0	2814.469477	0	421.9176554	0.424802726	116.5839643	48.3853086	3782.203702	0.847969708	4800.725996	0	940.2530272	0	0	0	0	0	0	64925.95938	4434635.492
Oct-96	2.11	70.99129118	15090.17215	85.69663006	7628.905445	45.02876183	16732.86968	3.972131768	3799.347139	9.692001515	929.5519079	60.92574025	7932.064861	25.21881106	2839.688288	7.571052177	429.4887926	0.57604362	117.1600079	52.0602802	3834.263982	16.80127225	4817.527268	0	940.2530272	0	0	0	0	0	0	65469.85349	4500105.346
Nov-96	1.2	60.65338887	15150.82554	70.66414237	7699.569587	36.50980689	16769.40649	5.869049602	3805.216188	7.495797047	937.047705	24.26626278	7956.331124	42.65366149	2882.341949	5.189234381	434.677942	0.486797425	117.6468054	43.99333586	3878.257318	12.70973116	4830.236999	26.06721696	966.3202441	0	0	0	0	0	0	65764.43632	4565869.782
Dec-96	2.86	83.1781295	15234.00367	75.55501704	7775.124604	56.14565998	16825.55215	11.43466869	3816.650857	9.930329421	946.9780344	41.67526846	7998.006392	51.24895115	2933.5909	7.92229042	442.600232	0.665289814	118.3120952	60.48458008	3938.741898	15.48117228	4845.718172	21.04384703	987.3640912	0.18711276	0.548154184	0.149081711	0.431356607	0	0	66298.72401	4632168.506
Jan-97	4.65	80.28776978	15314.29144	76.06209769	7851.186702	54.84922378	16880.40137	47.59797047	3864.248828	9.533116244	956.5111506	41.27636501	8039.282757	53.39559258	2986.986493	8.316122681	450.9163547	0.811329042	119.1234242	49.22062855	3987.962526	15.60118137	4861.319353	18.81105642	1006.175148	25.65828095	49.69390382	0	53.54771677	0.241708444	0	66903.30961	4699071.815
Feb-97	5.91	69.61726619	15383.90863	78.16675502	7929.353457	52.06028202	16932.46165	48.09087467	3912.338695	9.328202991	965.8392536	41.5260886	8080.808846	41.08334722	3028.069384	7.05328285	457.9609584	1.144967437	120.2653917	34.42695949	4022.389486	14.48830018	4875.807683	16.05755396	1022.232702	17.58751988	50.15191215	13.63338129	50.54855271	0.234194926	0	67276.64311	4766348.459
Mar-97	2.52	79.1045816	15463.01329	0	7929.353457	58.41569103	16990.87735	54.19678001	3966.536482	8.924619462	974.7638731	37.32113593	8118.129982	45.48513442	3073.554975	7.288439228	465.2581222	0	120.2653917	41.41158652	4063.801072	13.75878834	4889.566471	16.05755396	1038.290256	0	43.77796289	13.50524801	50.57284362	0.219058841	0	67563.45014	4833911.909
Apr-97	3.27	65.26618705	15528.27948	45.88262022	7975.236077	50.05376751	17040.93111	39.43942446	4005.975907	8.636728512	983.4006016	31.78250663	8149.912488	44.49223779	3118.047212	6.837410072	472.0955323	0.585105642	120.8504973	39.25785687	4103.058929	12.95509277	4902.521564	13.74024991	1052.030505	20.61037486	38.93070807	13.06959485	45.71904582	0.167663764	0	67929.76648	4901841.675
May-97	2.29	73.8647482	15602.14422	66.25853843	8041.494616	52.58426354	17093.51538	48.98737145	4054.963278	8.180901174	991.5815028	37.89582734	8187.808316	41.41158652	3159.458799	6.358791367	478.4543237	0.644499508	121.4949968	47.32752745	4150.386457	10.14161303	4912.663177	64.23021583	1116.260721	18.93101098	41.41158652	14.29967437	48.69664521	0.202832261	0	68491.65342	4970333.329
Jun-97	8.32	97.16319576	15699.30742	83.01400984	8124.508626	0	17093.51538	55.14420295	4110.107481	10.41968951	1002.001192	24.04543733	8211.853753	38.89799318	3198.356792	7.2136312	485.6679549	0.961817493	122.4568143	56.92389246	4207.310349	0	4912.663177	38.43998485	1154.700706	20.39772813	37.24589171	14.60719424	48.53252556	0.098144642	0	68855.55498	5039188.884
Jul-97	6.73	61.01870504	15760.32612	56.79303294	8181.301658	0	17093.51538	37.80793336	4147.915414	0	1002.001192	0	8211.853753	0	3198.356792	0	485.6679549	0	122.4568143	0	4207.310349	0	4912.663177	0	1154.700706	0	0	0	0	0	0	68633.68898	5107822.573
Aug-97	4.26	64.23021583	15824.55634	52.0602802	8233.361939	47.66558122	17141.18096	38.67842181	4186.593836	6.752624006	1008.753816	29.44448315	8241.298236	18.33941689	3216.696209	7.065323741	492.7332786	1.135860659	123.592675	49.22062855	4256.530978	10.68080878	4923.343986	16.35744036	1171.058146	8.316122681	16.90268838	10.3275426	41.42848921	0.198606588	0	69238.50493	5177061.078
Sep-97	5.84	3.418705036	15827.97505	77.86141613	8311.223355	44.39409315	17185.57505	41.95683453	4228.550671	12.02271867	1020.776535	38.8652783	8280.163514	46.6023476	3263.298557	7.19727376	499.9305524	1.053419159	124.6460941	48.58159788	4305.112576	11.45020825	4934.794194	15.88852707	1186.946674	15.80128739	18.71291178	13.83839455	47.12578569	0	0	69613.76362	5246674.841
Oct-97	4.22	78.3947701	15906.36982	73.01961378	8384.242969	38.89308595	17224.46814	52.87160924	4281.42228	9.127451723	1029.903987	32.99404771	8313.157562	43.77796289	3307.07652	6.904748201	506.8353006	1.166285498	125.8123796	51.11372965	4356.226305	11.66285498	4946.457049	16.05755396	1203.004227	15.61808406	36.15485044	14.29967437	46.51619841	0.305262552	0	70113.85432	5316788.695
Nov-97	4.96	85.3858387	15991.75565	57.41461568	8441.657584	42.88920863	17267.35735	43.26542976	4324.68771	9.225596365	1039.129583	38.93070807	8352.08827	46.6023476	3353.678867	6.893025369	513.7283259	1.140931465	126.9533111	48.58159788	4404.807903	11.28663385	4957.743683	14.85803559	1217.862263	12.74244604	23.70193109	10.53419159	36.57523665	0.321914426	0	70481.80019	5387270.496
Dec-97	7.48	68.96296857	16060.71862	52.48284741	8494.140432	0	17267.35735	51.87604089	4376.563751	4.381176827	1043.51076	74.70988262	8426.798153	19.26906475	3372.947932	7.122792881	520.8511188	0	126.9533111	41.07353275	4445.881436	0	4957.743683	15.21241954	1233.074683	14.55321469	29.15713745	11.9163953	45.78938281	0.297487315	0	70763.34557	5458033.841
Jan-98	8.45	72.77621507	16133.49484	58.77909883	8552.91953	0	17267.35735	59.88284438	4436.446595	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	0	4445.881436	0	4957.743683	0	1233.074683	0	0	0	0	0	0	70709.41754	5528743.259
Feb-98	6.19	61.4952518	16194.99009	33.70025293	8586.619783	0	17267.35735	25.03778872	4461.484384	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	0	4445.881436	0	4957.743683	0	1233.074683	0	0	0	0	0	0	70758.44597	5599501.705
Mar-98	7.19	58.12834532	16253.11844	59.3284362	8645.94822	0	17267.35735	47.66558122	4509.149965	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	41.74964029	4487.631076	0	4957.743683	0	1233.074683	0	0	0	0	0	0	71051.95668	5670553.661
Apr-98	5.67	73.60848654	16326.72692	57.6272624	8703.575482	0	17267.35735	47.10942825	4556.259393	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	0	4487.631076	0	4957.743683	0	1233.074683	0	0	0	0	0	0	71201.77503	5741755.436
May-98	3.38	79.1045816	16405.8315	56.25214691	8759.827629	0	17267.35735	48.46000757	4604.719401	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	0	4487.631076	0	4957.743683	0	1233.074683	0	0	0	0	0	0	71391.06333	5813146.5
Jun-98	3.94	69.30647482	16475.13797	63.59772813	8823.425357	0	17267.35735	54.92828474	4659.647686	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	27.77493374	4515.40601	0	4957.743683	0	1233.074683	0	0	0	0	0	0	71638.46143	5884784.961
Jul-98	5.8	61.52578569	16536.66376	47.91912154	8871.344479	0	17267.35735	0	4659.647686	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	21.09455509	4536.500565	0	4957.743683	0	1233.074683	0	0	0	0	0	0	71683.93294	5956468.894
Aug-98	5.43	68.28686104	16604.95062	49.74461189	8921.08909	0	17267.35735	59.22702007	4718.874706	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	25.44530708	4561.945872	0	4957.743683	0	1233.074683	0	0	0	0	0	0	71958.80107	6028427.695
Sep-98	8.17	54.96099962	16659.91162	45.93169254	8967.020783	0	17267.35735	7.687996971	4726.562703	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	29.19151534	4591.065387	0	4957.743683	0	1233.074683	0	0	0	0	0	0	72031.49768	6100459.193
Oct-98	0.45	79.1045816	16739.0162	59.67071564	9026.691499	0	17267.35735	53.22656569	4779.789268	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	34.21273154	4625.278119	0	4957.743683	0	1233.074683	0	0	0	0	0	0	72346.22667	6172805.42
Nov-98	0.72	76.22567209	16815.24187	53.88140856	9080.572907	0	17267.35735	53.0471791	4832.836447	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	24.86330935	4650.141428	0	4957.743683	0	1233.074683	0	0	0	0	0	0	72536.04721	6245341.467
Dec-98	2.17	80.93007194	16896.17195	73.47598637	9154.048894	0	17267.35735	50.84328663	4883.679734	0	1043.51076	0	8426.798153	0	3372.947932	0	520.8511188	0	126.9533111	39.46270655	4689.604135	0	4957.743683	0	1233.074683	0	0	0	0	0	0	72817.45374	6318158.921
Jan-99	6.4	56.43638622	16952.60833	43.92822779	9197.977121	33.13957986	17300.49693	75.13399016	4956.833724	8.258315487	1051.769075	23.85138357	8450.649536	33.96290981	3406.910842	4.829943203	525.681062	1.491527028	128.4448381	26.43157895	4716.035714	9.35604368	4967.099727	12.42347596	1245.498159	5.073713775	12.19275426	6.082533828	24.65358516	0.196240212	0	73275.46724	6391434.388
Feb-99	2.8	59.5471897	17012.15552	37.29042757	9235.267549	27.28264021	17327.77957	38.25911518	4995.092839	8.510710791	1060.279786	20.60671079	8471.256247	31.77844998	3438.689292	4.806995895	530.4880579	1.074457009	129.5192951	28.16201621	4744.19773	5.228119288	4972.327846	12.17500644	1257.673165	0.033740432	9.701853056	5.138868732	21.22044195	0.165646346	0	73489.70928	6464924.097
Mar-99	2.6	71.87868232	17084.0342	55.30221583	9290.569765	34.51190913	17362.29147	77.71856115	5072.811401	10.74960273	1071.029389	31.38863037	8502.644878	45.51031942	3484.199611	6.228082878	536.7161408	0	129.5192951	39.14155547	4783.339285	0	4972.327846	12.92041499	1270.59358	5.843191761	18.75894161	6.963738584	28.77598183	0.192927285	0	74005.96162	6538930.059
Apr-99	2.18	75.93123817	17159.96544	60.81696327	9351.386728	38.97119273	17401.26267	54.27398713	5127.085388	4.336357144	1075.365746	26.9448883	8529.593761	43.16728512	3527.366896	6.738283983	543.4544248	1.133570617	130.6528657	35.89640288	4819.235688	3.16663688	4975.494483	15.70968573	1286.303266	5.882544491	14.80021204	7.378023476	30.31524423	0.221594245	0	74352.85546	6613282.914
May-99	2.05	46.85425218	17206.81969	50.57284362	9401.959572	33.37358425	17432.60825	49.18175237	5176.26714	11.47692541	1086.842672	24.59848239	8554.192243	32.47851571	3559.845412	5.986087084	549.4405119	1.254855585	131.9077213	31.33420371	4850.568892	7.279987883	4982.774471	14.90817115	1301.211437	5.001843544	11.83188186	6.528156304	26.73858839	0.165849178	0	74591.99627	6687874.91
Jun-99	4.46	67.32722454	17274.14692	52.99810678	9454.957678	47.81934116	17480.41959	59.42330935	5235.690449	11.90003786	1098.74271	31.92318061	8586.115424	45.22505112	3605.070463	10.69449451	560.1350064	1.112894813	133.0206161	38.13900795	4888.7089	10.9853298	4993.759801	12.02271867	1313.234156	6.162502083	13.79913669	7.65528209	39.75512306	0.23031276	0	75081.17477	6762956.085
Jul-99	4.87	66.5965922	17340.74351	54.76471034	9509.722389	31.70521772	17512.12481	42.82127073	5278.51172	10.35053025	1109.09324	21.43582037	8607.551244	33.83681575	3638.907279	7.933986702	568.0689931	1.278384127	134.2990003	30.90757986	4919.61648	9.203902582	5002.963703	0	1313.234156	4.225672094	11.03519055	5.550369587	22.1540156	0.186352139	0	75288.82294	6838244.908
Aug-99	3.53	55.07149413	17395.815	43.8371223	9553.559511	32.51637774	17544.64119	41.84480242	5320.356523	10.20719546	1119.300435	20.67570647	8628.22695	36.52941401	3675.436693	0	568.0689931	1.034951609	135.3339519	31.87847028	4951.49495	9.938189171	5012.901892	12.99827641	1326.232432	4.20961454	10.79067626	5.176279288	19.88821022	0.161758728	0	75568.12706	6913813.035
Sep-99	5.23	61.37475199	17457.18976	45.77466111	9599.334172	29.02562363	17573.66681	44.05467626	5364.411199	10.76744869	1130.067884	22.29764483	8650.524595	36.11591973	3711.552612	0	568.0689931	1.102900417	136.4368523	28.23948504	4979.734435	6.513140174	5019.415033	11.85689784	1338.08933	4.198300644	10.06928042	5.403974858	25.95435062	0.171164256	0	75871.41189	6989684.447
Oct-99	2.42	76.71749943	17533.90726	59.78480878	9659.118981	39.08915714	17612.75597	59.2523741	5423.663573	13.33486891	1143.402753	25.62109504	8676.14569	46.19403317	3757.746646	0	568.0689931	1.102900417	136.1031193	34.92568694	5014.660122	10.00706763	5029.4221	28.3897554	1366.479085	4.41062131	10.86619747	5.599083135	26.11600576	0.169111397	0	76365.61792	7066050.065
Nov-99	0.9	47.78989777	17581.69715	45.6814237	9704.800405	3.384517986	17616.14049	42.33861719	5466.00219	10.6964574	1154.09921	20.88779705	8697.033487	43.48331087	3801.229957	0	568.0689931	1.245455509	139.3485748	31.7219841	5046.382106	9.76122075	5039.183321	12.38830746	1378.867393	3.865672094	9.670616888	4.464845134	17.62514199	0.150799243	0	76498.00934	7142548.074
Dec-99	1.6	80.07817645	17661.77533	50.09956835	9754.899973	36.50727149	17652.64776	52.97116607	5518.973356	12.12531253	1166.224523	25.34591927	8722.379407	42.25401651	3843.483973	0	568.0689931	1.380205922	140.7287807	38.24909353	5084.6312	10.51473987	5049.698061	15.76141886	1394.628812	4.154308944	10.42081163	5.525404317	26.29906187	0.17768106	0	76970.00432	7219518.079
Jan-00	6.82	35.49564559	17697.27598	53.61532753	9808.515301	35.09674214	17687.74745	53.4648936	5572.938225	11.16395153	1177.388474	28.8072518	8751.186658	52.73638773	3896.220361	9.719045816	577.7888389	1.342580538	142.0136613	24.02210072	5108.6533	10.98167664	5060.697837	15.35746036	1410.986252	5.124028777	8.854922226	36.10424847	0.193366755	0	77275.64583	7296793.724
Feb-00	0.79	67.29669065	17764.56767	48.02980689	9856.545107	30.77815979	17718.52266	47.26645967	5619.704709	12.26851647	1189.756991	22.12180235	8773.308461	39.04368345	3935.264044	8.567809163	586.3558481	1.16578387	143.2371451	35.03763726	5143.690938	0	5060.679737	19.26906475	1430.255317	3.786965543	10.61205301	5.498848012	26.71867929	0.154501477	0	77599.50509	7374393.23
Mar-00	3.67	111.2196895	17875.78736	62.40472548	9918.949833	41.44877243	17759.97143	69.11509277	5688.819802	13.63032791	1203.387319	29.99382052	8803.302281	54.59568345	3989.859728	10.38501174	596.7408598	1.337340704	144.5744858	29.116571	5172.807509	2.154078607	5062.833816	17.74782279	1448.003139	4.012529193	8.743760697	5.52819326	40.99239985	0.163618023	0	78167.627	7452560.857
Apr-00	1.76	90.1294964	17965.91685	62.9761454	9981.925978	28.65823552	17788.62967	46.81990155	5735.639704	12.0129042	1215.400223	27.58518743	8830.887469	47.99273003	4037.852458	12.21900795	608.9598677	0.922559637	145.4970455	39.4148883	5212.222397	8.576205983	5071.410022	13.43491102	1461.43805	4.171474441	9.996031806	5.074078001	25.60266566	0.158340023	0	78491.5245	7531052.381
May-00	0.19	55.06895873	18020.98581	56.38736842	10038.31335	33.8729875	17822.50266	53.14712306	5788.786827	13.71146081	1229.111684	20.45901401	8851.346483	48.73738069	4086.589838	5.845625748	614.8054935	1.189611208	146.6866567	35.37394623	5247.596343	5.634680197	5077.044702	15.21241954	1476.65047	3.936298069	10.27007346	5.582619917	25.94731693	0.171055206	0	78790.96825	7609843.349
Jun-00	5.23	64.48102991	18085.46684	0	10038.31335	30.73235895	17853.23501	56.12237789	5844.909205	12.16993563	1241.281619	22.34753502	8873.694018	44.31884892	4130.908687	5.590645967	620.3961395	1.542506626	148.2291633	36.73553957	5284.331883	5.594244604	5082.638947	14.90817115	1491.558641	3.326449072	8.318249148	4.74791064	25.03996971	0.143945475	0	79031.08322	7688874.433
Jul-00	2.47	78.96936009	18164.4362	0	10038.31335	48.49212268	17901.72714	58.70810754	5903.617312	13.28145642	1254.563076	26.0081666	8899.702184	51.57686331	4182.485551	5.093456115	625.4895956	2.105229837	150.3343932	41.66512685	5325.99701	14.79931783	5097.438265	17.39286634	1508.951507	3.569002651	7.891865203	4.836873306	26.60145097	0.156180841	0	79454.20303	7768328.636
Aug-00	4.64	50.20098448	18214.63719	0	10038.31335	33.43013707	17935.15727	58.86699281	5962.484305	14.11712533	1268.680201	16.43617418	8916.138359	42.32095115	4224.806502	6.943286331	632.4328819	1.947189701	152.1815829	25.48080273	5351.477812	8.77452359	5106.212788	11.62196138	1520.573469	4.241222567	8.29228989	3.071556532	20.64156304	0.156180841	0	79629.73865	7847958.374
Sep-00	9.47

Month	Rainfall (in)	RWM-1	RWM-1 (cumulative)	RWM-2	RWM-2 (cumulative)	RWM-3	RWM-3 (cumulative)	RWM-4	RWM-4 (cumulative)	RWM-5	RWM-5 (cumulative)	RWM-6	RWM-6 (cumulative)	RWM-7	RWM-7 (cumulative)	RWM-8	RWM-8 (cumulative)	RWM-9	RWM-9 (cumulative)	RWM-10	RWM-10 (cumulative)	RWM-11	RWM-11 (cumulative)	RWM-12	RWM-12 (cumulative)	RWM-13b	RWM-13c	RWM-14b	RWM-14c	RWM-15b	RWM-17b	all wells /mo.	all wells accum.
May-04	2.95	15.48556698	19549.67768	14.21989368	10211.17133	25.36417418	19618.11902	47.55148807	8164.996525	13.50862855	1879.171107	24.10864248	9728.555999	40.33708262	5860.144611	6.593671125	892.4883096	4.906681409	302.2138393	Well was shut down	9709.308533	4.211609057	5369.009627	11.85554563	214.8104773	0.990159485	2.113850208	3.483086285	14.62386793	0.043608936	0.68192206	93662.94083	11736461.34
Jun-04	8.38	13.70360924	19563.38129	15.42833775	10226.59967	34.81926543	19652.93828	35.30802575	8200.304551	14.07394169	1893.245049	19.87306323	9748.429062	45.70056191	5905.845173	5.55420159	898.0425112	4.974493904	307.1883332		9709.308533	4.370544491	5373.380171	12.45651799	2160.461291	1.110212192	2.535943052	3.363187883	15.52648239	0.049006891	1.042492389	93869.01398	11830330.36
Jul-04	4.54	10.6909504	19574.07224	17.53248254	10244.13215	37.86066975	19690.79895	42.83563802	8243.140189	16.14544794	1909.390497	17.0034284	9765.43249	37.73736463	5943.582537	6.915903976	904.9584152	5.298908292	312.4872415		9709.308533	5.368767103	5378.748938	13.60666414	2174.067955	1.355426581	3.064339084	4.174625975	17.37004771	0.050403817	1.176680651	94088.30789	11924418.66
Aug-04	2.36	11.29370027	19585.36594	12.4451114	10256.57727	30.31328133	19721.11224	33.41678395	8276.556973	11.9880627	1921.378559	14.47174373	9779.904234	26.19511034	5969.777648	4.931410042	909.8898252	4.819159288	317.3064008		9709.308533	3.260866641	5382.009805	9.851759182	2183.919715	0.989145324	2.231408406	3.007343218	14.73982037	0.042797607	0.894152215	94197.99879	12018616.66
Sep-04	8.66	15.10135252	19600.46729	19.90089133	10276.53616	44.44987202	19765.56211	38.29064142	8314.847614	18.1651011	1939.543661	18.23723741	9798.141472	32.1610178	6001.938665	4.988741234	914.8785665	5.092790913	322.1964808		9709.308533	4.081884741	5386.09169	10.8393936	2194.759071	1.101968042	2.638864067	4.02795426	16.01853056	0.027873078	1.232205983	94442.9523	12113059.61
Oct-04	0.37	10.77140719	19611.2387	10.97998637	10278.54814	14.26924953	19779.83136	27.6409663	8342.48858	11.41453758	1950.958198	0	9798.141472	27.65702385	6029.595689	0	914.8785665	4.747289057	327.1464808		9709.308533	3.982493116	5390.074183	10.5853086	2205.344379	1.030252662	2.31952212	3.023350064	12.27321106	0.050285498	0.941412132	94479.24057	12207538.85
Nov-04	4.61	11.02998561	19622.26868	10.82731693	10289.37546	20.08726392	19799.91862	37.91654676	8380.405127	11.05548686	1962.013685	19.63187278	9817.773344	29.67926694	6059.274956	5.267553805	920.1461203	4.691706475	331.8381872		9709.308533	3.961870201	5394.036053	10.34640818	2215.690787	0.969603635	2.168849375	3.047930935	11.69925028	0.042300341	0.823727982	94685.2965	12302224.15
Dec-04	1.67	11.6020053	19633.87069	11.82765619	10301.20312	24.24149761	19824.16012	33.96874123	8414.373868	11.73181795	1973.745503	14.83802499	9832.611369	35.77504703	6095.050003	3.183300204	923.3294205	4.77132468	336.6095119		9709.308533	3.934100719	5397.970154	9.738483908	2225.429271	0.99063276	2.236360894	2.739080651	8.991047028	0.05111373	0.827048542	94849.10884	12397073.26
Jan-05	2.03	14.92338357	19648.79407	16.19886043	10317.40198	24.44940068	19848.60952	42.57330829	8456.947177	11.32446316	1985.069966	15.19720712	9847.808576	24.73995789	6119.789961	5.065989246	928.3954097	5.059566225	341.6690781		9709.308533	3.205256797	5401.17541	9.323741007	2234.753012	0.919590761	2.179179099	2.95592524	10.35103733	0.050758773	0.806866732	95029.04718	12492102.31
Feb-05	4.68	12.86972874	19661.6638	12.71820432	10330.12018	21.92837016	19870.53789	30.50885089	8487.456028	10.59648073	1995.666447	12.66164029	9860.470217	23.4240727	6143.214034	4.38993351	932.7853432	4.096334903	345.765413		9709.308533	3.33246861	5404.507879	10.6953958	2245.448408	0.929039364	2.180119652	2.714050496	9.622297009	0.045632897	0.884078213	95150.54087	12587252.85
Mar-05	5.1	12.56512048	19674.22892	12.88491935	10343.0051	24.22510201	19894.76299	37.3731117	8524.829139	12.71132874	2008.377776	14.01300477	9874.483222	29.92722393	6173.141258	4.676754139	937.4620974	4.2822961	350.0477091		9709.308533	3.380960242	5407.888839	10.33126119	2255.779669	0.889926543	2.104469216	2.703585006	12.76879788	0.050640454	0.854870367	95339.05863	12682591.91
Apr-05	1.94	11.35860659	19685.58753	11.31280576	10354.31791	25.13484286	19919.89783	37.35457054	8562.18371	13.65355547	2022.031331	11.17867474	9885.661896	31.90355168	6205.04481	5.121678152	942.5837755	5.009302537	355.0570117		9709.308533	2.903118516	5410.791958	9.943360848	2265.72303	0.91601666	2.104057554	2.771931844	12.43001893	0.035004922	0.706641424	95502.02706	12778093.93
May-05	1.45	9.620334116	19695.20786	7.63004256	10361.94795	17.42048533	19937.31832	39.50665354	8601.690363	13.27875199	2035.310083	12.81392806	9898.475824	33.1461719	6238.190981	5.40345142	947.9872269	4.102958576	359.1599702		9709.308533	2.811255131	5413.603213	9.296478607	2275.019509	0.745577584	1.844421356	2.825622416	10.48304733	0.036256267	0.632532404	95644.8178	12873738.75
Jun-05	5.45	12.68028777	19707.88815	11.17540326	10373.12335	25.17737221	19962.49569	29.52517986	8631.215543	13.62574782	2048.935831	11.23429004	9909.710114	29.1293298	6267.320311	5.189397955	953.1766249	4.297753881	363.4577241	0	9709.308533	3.224378644	5416.827592	10.61107156	2285.63058	0.623136691	1.548068156	2.697014767	12.14376373	0.03565922	0.566163726	95802.57407	12969541.33
Jul-05	5.91	18.25557955	19726.14373	10.79067626	10383.91403	27.17901583	19989.67471	38.37755396	8669.593097	13.98934101	2062.925172	11.07210602	9920.78222	40.35398531	6307.674297	5.440299281	958.6169242	4.396389246	367.8541134	0	9709.308533	3.450328875	5420.27792	11.87920939	2297.50979	0.84256521	2.147993639	2.918959061	12.41586975	0.039248042	0.804567967	96018.62822	13065559.95
Aug-05	3.34	12.12945369	19738.27318	10.46682075	10394.38085	26.93054631	20016.60525	39.09541113	8708.688508	13.11513396	2076.040306	12.18683832	9932.969059	36.74712064	6344.421417	5.283340916	963.9002651	4.174118894	372.0282323	0	9709.308533	3.175744703	5423.453665	10.20295343	2307.712743	0.751155471	2.089561045	2.630075214	11.76900386	0.042493359	0.809199303	96179.38099	13161739.34
Sep-05	0	9.626353654	19747.89954	7.544869368	10401.92572	22.36552821	20038.97078	30.70356986	8739.392078	10.73211662	2086.772422	10.05279212	9943.021851	37.52658538	6381.948003	5.377475805	969.2777409	3.72900568	375.7572379	0	9709.308533	2.827645286	5426.28131	9.588219008	2317.300962	0.800762136	2.102634457	2.641072321	10.6555638	0.043183643	0.707295721	96304.88085	13258044.22
Oct-05	2.64	12.45009769	19760.34963	7.06701401	10408.99273	27.36139583	20066.33218	30.68547853	8770.077557	12.55024612	2099.322669	13.58570481	9956.607556	37.07976554	6419.027768	4.917668156	974.1954091	4.163081439	379.9203194	0	9709.308533	3.159974495	5429.441285	11.34085877	2328.641821	0.789068201	2.089983612	3.088831079	14.90817115	0.051941961	0.765894616	96488.27264	13354532.49
Nov-05	2.87	15.20865733	19775.55829	9.282847406	10418.27558	25.12486482	20091.45704	27.54282166	8797.620378	0	2099.322669	9.914244604	9966.5218	30.91638016	6449.944148	5.037519122	979.2329282	3.879166982	383.7994864	0	9709.308533	2.521188641	5431.962474	7.723165468	2336.364986	0.7131844	1.970531768	5.526668383	10.55578342	0.041613328	0.62550852	96592.95246	13451125.44
Dec-05	5.37	16.54097084	19792.09926	8.44796365	10426.72354	31.17413525	20122.63118	41.1134231	8838.733801	0	2099.322669	13.12459947	9979.6464	38.45091162	6488.39506	5.42522283	984.6581503	3.848437895	387.6479243	0	9709.308533	3.497335252	5435.459809	11.76089057	2348.125877	0.820135343	2.267089981	2.564543491	13.02893025	0.043000439	0.743312624	96805.60311	13547931.04
Jan-06	3.06	13.41735403	19805.51662	7.657762969	10434.38131	21.61921454	20144.25039	31.16619099	8869.899992	3.415120576	2102.737789	9.727835214	9989.374235	28.19064173	6516.585702	5.182127618	989.8402779	2.801789625	390.4497139	0	9709.308533	2.135874411	5437.595683	9.449366149	2357.575243	0.699974131	1.611738947	1.199989459	10.27548232	0.016666051	0.638279318	96896.72089	13644827.77
Feb-06	2.69	15.95334616	19821.46996	7.964917531	10442.34622	20.86182143	20165.11221	38.34491541	8908.244908	5.570907989	2108.308697	11.55402348	10000.92826	27.97514881	6544.56085	4.928627641	994.7689055	4.451840969	394.9015549	0	9709.308533	3.314377281	5440.91006	9.408712457	2366.983956	0.678463006	1.561747338	2.47365719	10.32656115	0.029388868	0.581212571	97063.82379	13741891.59
Mar-06	2.97	19.96173692	19841.4317	8.870361833	10451.21659	30.80548762	20195.9177	34.82545399	8943.070362	5.816570027	2114.125267	13.14150216	10014.06976	45.00543612	6589.566287	2.453729466	997.222635	3.842048679	398.7436035	0	9709.308533	3.669489133	5444.57955	6.796114623	2373.78007	0.840469277	1.91392521	2.934002454	10.2584106	0.045552745	0.691150928	97264.9035	13839156.49
Apr-06	3	25.37856872	19866.81027	11.57288906	10462.78947	23.98131617	20219.89902	31.86265808	8974.93302	12.17238925	2126.297656	11.7188961	10025.78872	30.44872094	6620.015007	5.282144642	1002.50478	3.722233699	402.4658372	0	9709.308533	2.641072321	5447.220622	7.831026429	2381.611097	0.610018023	1.512654298	2.244911473	9.565176827	0.031651647	0.558622946	97420.77905	13936577.27
May-06	1.66	29.74197067	19896.55224	9.621855858	10472.41123	19.56266445	20239.46168	27.87980129	9002.812821	10.95294207	2137.250598	11.30451799	10037.09324	18.31845755	6638.333465	5.059325142	1007.598405	3.386335297	405.8521725	0	9709.308533	2.574380856	5449.795003	10.77444968	2392.385546	0.590174267	1.627232326	2.506702491	10.10172268	0.040650966	0.472531556	97553.40514	14034130.68
Jun-06	5.28	24.47339644	19925.02564	9.84685195	10482.25818	18.16755471	20257.62924	26.82096782	9029.633789	9.453291935	2146.70389	9.500401363	10046.59364	18.08216888	6656.415634	4.611620447	1012.210025	3.149657857	409.0018304	0	9709.308533	2.596498296	5452.391501	8.553305566	2400.938852	0.537865354	1.468489209	2.422864067	9.804649754	0.0329766	0.481726619	97682.11504	14131812.79
Jul-06	2.39	28.47764938	19953.50328	9.735948504	10491.99413	20.29032518	20277.91956	28.12928497	9057.763074	9.381222772	2160.685118	11.10709459	10057.70074	23.97612541	6680.391759	6.082347899	1018.292373	3.583369936	412.5852003	0	9709.308533	3.196298372	5455.587799	11.67688421	2412.615736	0.704909716	1.905355547	2.676473094	11.64983991	0.026232972	0.61289148	97866.15957	14229678.95
Aug-06	2.35	25.08527982	19978.58856	10.55336251	10502.54749	21.61989065	20299.53945	31.27977705	9089.042851	14.33145142	2175.01657	10.13147141	10067.83221	24.81196335	6705.203723	5.944607891	1024.236981	3.855486316	416.4406866	0	9709.308533	3.561633078	5459.149433	11.7879894	2424.403725	0.72524365	2.333585157	2.73448312	12.14153911	0.026097751	0.549404983	98032.78349	14327711.73
Sep-06	2.31	28.62552064	20007.21409	7.253706929	10509.8012	18.8712518	20318.4107	28.42170693	9117.464558	11.33717834	2186.353748	7.613570617	10075.44578	19.66266263	6724.886385	5.182495115	1029.419476	3.170071942	419.6107586	0	9709.308533	2.420574025	5461.570007	4.71165819	2429.115384	0.572085119	1.709188944	2.182802272	6.669271942	0.025321318	0.496219311	98137.5459	14425849.28
Oct-06	3.48	36.17175312	20043.38584	8.297022643	10518.09822	24.44230155	20342.85301	28.46446528	9145.929023	11.40356774	2197.757316	11.15036547	10086.59614	21.26797668	6746.154362	5.075674487	1034.495151	3.118038925	422.7287975	0	9709.308533	2.991302567	5464.561309	9.389781446	2438.505165	0.645513669	1.585894737	2.515965165	8.666346384	0.032706702	0.684356047	98326.2759	14524175.56
Nov-06	2.55	21.43478985	20064.82063	9.569102613	10527.66733	22.1885407	20365.04155	26.11334495	9172.042368	9.748707308	2207.506023	9.546529345	10096.14267	20.78997955	6766.944342	4.564854525	1039.060005	2.791822491	425.52062	0	9709.308533	2.694479364	5467.255788	9.817081409	2448.322246	0.653250738	1.62306702	2.556569784	10.53190155	0.031815222	0.597013858	98444.88495	14622620.44
Dec-06	2.7	23.85307384	20088.6737	11.53980341	10539.20713	26.57947747	20391.62102	39.74565755	9211.788026	13.99373571	2221.499759	14.12726694	10110.26994	32.84141643	6799.785758	5.085207603	1044.145213	2.979943961	428.500564	0	9709.308533	2.77327479	5470.029063	9.277885649	2457.600132	0.65413404	1.585894737	2.555821704	10.95750579	0.032960242	0.722589928	98671.73449	14721292.18
Jan-07	4.15	26.626805	20115.30051	9.592275653	10548.7994	20.91132995	20412.53235	29.50229034	9241.290316	14.15836789	2235.658126	191.2429322	10301.51287	29.04811511	6828.833873	5.919727134	1050.06494	3.060028898	431.5605929	0	9709.308533	3.200777584	5473.229841	10.28310488	2467.883237	0.645513669	1.836899659	2.826873215	11.80416145	0.026368194	0.706532374	99177.3667	14820469.54
Feb-07	2.51	28.5797198	20143.88023	8.287202726	10557.08661	22.43508005	20434.96743	26.23288512	9267.523201	14.52802423	2250.186151	161.8570905	10463.36996	21.52608618	6850.359959	4.860476002	1054.925416	2.705959016	434.2665519	0	9709.308533	2.668906142	5475.898747	9.557456115	2477.440693	0.562251026	1.370589928	2.403581916	9.514665051	0.029923211	0.601899281	99436.93528	14919906.48
Mar-07	2.02	32.96700341	20176.84723	9.090941916	10566.17755	24.46968391	20459.43712	31.22450526	9298.747706	11.68888512	2261.875036	174.5912488	10637.96121	24.87889799	6875.238857	5.151533752	1060.07695	2.947592215	437.2141441	0	9709.308533	2.913127633	5478.811875	9.764345021	2487.205038	0.693686331	1.788608679	2.291463658	10.41205604	0.026368194	0.608902446	99794.4101	15019700.89
Apr-07	2.13	29.4041348	20206.25136	8.600087846	10574.77764	24.66145854	20484.09858	28.95528663	9327.702993	13.99150019	2275.866536	185.1776751	10823.13889	22.1885407	6897.427398	5.336320485	1065.41327	3.05678031	440.2709244	239.7879712	9949.096504	2.780110564	5481.591985	9.995573798	2497.200612	0.522937554	1.521438243	2.475535025	9.296260507	0.031291129	0.617370693	100611.237	15120312.12
May-07	0.63	22.80679743	20229.05816	8.015930935	10582.79357	22.00848345	20506.10706	35.0342022	9362.737195	16.14967361	2292.01621	205.3404504	10828.47934	31.96129345	6929.388691	5.955696055	1071.368966	3.407531268	443.6784557	281.6451017	10230.74161	3.221229837	5484.813215	9.397218629	2506.597831	0.634418744	1.41056315	2.220759712	10.1194705	0.035531141	0.590258781	101327.7349	15221639.86
Jun-07	4.42	35.48280197	20284.54096	7.151309353	10589.94488	21.43478985	20527.54185	29.85985309	9392.597048	13.49030822	2305.506518	118.8204468	11147.29978	41.65651193	6971.045203	5.279638777	1076.642605	2.77847482	446.4569305	0	10230.74161	2.680820901	5487.494036	10.92284438	2517.520675	0.537832639	1.648829989	2.337726013	10.17367361	0.031499529	0.558023446	101302.3715	15322942.23
Jul-07	4.55	33.46732648	20318.01209	8.815090042	10598.77099	23.58899205	20551.13905	32.49744672	9425.094046	14.43489587	2319.941414	0	11147.29978	39.65405283	7010.685726	5.667902033	1082.310042	2.931534861	449.3894852	360.1645122	10590.90612	2.501959826	5489.896195	9.87901791	2527.396747	0.541562136	1.478816206	2.334264378	9.756569784	0.029759199	0.572184551	102059.5109	15425001.45
Aug-07	2.69	34.03789474	20372.04618	8.898251268	10607.65822	24.9713557	20576.10125	35.95370844	9461.048204	13.83282211	2333.774236	0	11147.29978	42.80774858	7053.493475	6.112671321	1088.442268	3.086566119	452.4750313	0	10590.90612	2.696959152	5492.692255	8.272448315	2535.669195	0.597679061	1.36977963	2.386625793	8.896710047	0.029796059	0.526214222	101926.0603	15526927.51
Sep-07	2.13	59.73573646	20431.78192	7.766185536	10615.4244	20.65126846	20596.75251	32.90004695	9493.94825	12.3433245	2346.11756	0	11147.29978	42.22771374	7095.721188	5.161917456	1093.584598	3.046785914	455.5218172	0	10590.90612	2.869471261	5495.561726	9.461110791	2545.130306	0.597648527	0	2.384914805	11.01673608	0.026282154	0.516221189	102118.4555	15629045.97
Oct-07	1.76	44.02812268	20475.81004	7.661143506	10623.08555	24.20803029	20620.96054	32.27466929	9526.22292	0	2346.11756	0	11147.29978	35.18328391	7130.904472	5.512051193	1099.096649	2.981634229	458.5034514	26.68511927	10617.59124	3.119019281	5498.680745	10.62300159	2555.753307	0.737954472	0	2.310546793	10.5362908	0.03686882	0.634719612	102306.5587	15731352.53
Nov-07	0.42	61.17682696	20536.98687	6.634577811	10629.72013	19.88230519	20640.84285	28.56597955	9554.788899	0	2346.11756	161.5738887	11308.87367	30.27565922	7161.180132	5.65990337	1104.756552	2.610303976	461.1137554	255.9415979	10873.53284	2.653291329	5501.334037	9.424339265	2565.177647	0.606092238	1.171683453	2.236225672	9.788292314	0.041857381	0.569351791	103283.2371	15834635.76
Dec-07	6.97	68.68407421	20605.67094	6.220696403	10635.94082	0	20640.84285	32.33416676	9587.123066	13.50017721	2359.617738	169.7706602	11478.64427	27.00103052	7188.181162	5.784809875	1110.541362	2.910845771	464.0246012	0	10873.53284	2.903560712	5504.237597	7.488465642	2572.666112	0.544334176	1.171356304	1.803888709	6.893440303	0.034895431	0.583749555	103368.6535	15938004.42
Jan-08	3.57	69.16580083	20674.83674	8.155547141	10644.09637	0	20640.84285	31.48970844	9618.612775	12.33220144	2371.949939	5.168842105	11483.83132	36.21062931	7224.391791	5.814186747	1116.355549	2.913178342	466.9377795	8.221467626	10881.7543	2.4137039	5506.651301	0	2572.666112	0.668558114	1.289744023	2.430918784	8.366966779	0.035337477	0.559817039	103398.1452	16041402.56
Feb-08	4.55	52.82362741	20727.66037	7.780034835	10651.8764	0	20640.84285	24.85458538	9643.46736	13.8501719	2385.800111	3.558724725	11487.37184	19.23634987	7243.628141	5.463123362	1121.818672	2.720569481	469.658349	7.938811056	10889.69311	2.783316622	5509.434618	0	2572.666112	0.612564627	1.308640106	2.249879864	9.416934396	0.031719632	0.509457933	103499.0565	16144901.62
Mar-08	3.47	59.12560394	20786.78597	7.423660735	10659.30006	17.03790988	20657.88076	27.14571753	9670.613077	13.90246119	2399.702572	6.449929572	11492.02177	34.02173116	7277.649872	6.17472109	1127.993393	3.056682166	472.7150311	22.06814994	10911.76126	2.97183067	5512.406449	0	2572.666112	0.527450851	1.708573875	2.091868072	11.2774593	0.022160114	0.535477168	103755.2377	16248656.86
Apr-08	3.63	58.4778493	20845.26382	5.929572132	10665.22964	15.75548656	20673.63625	23.55144264	9694.164652	14.2898599	2413.992432	6.442241575	11496.66401	28.45376751	7306.10364	4.929314654	1132.922708	2.701431276	475.4164624	40.5664521	10952.32772	2.679348732	5515.085797	0	2572.666112	0.592807327	1.178251003	2.196936795	9.721528407	0.026649587	0.272187808	103959.4382	16352616.29
May-08	3.15	54.10550549	20899.36933	5.517037486	10670.74667	14.00894813	20687.64519	25.96929042	9720.133811	12.57560015	2426.568032	3.525224688	11500.18924	27.03585006	7333.13949	5.855936388	1138.778644	2.692598258	478.1090607	22.73411587	10975.06183	2.484695191	5517.570493	0	2572.666112	0.501095258	0.914194766	1.856759593	7.708048011	0.028353656	0.413101704	104107.9043	16456724.2
Jun-08	0.26	59.19757668	20958.56691	7.53750852	10678.28418	18.5542446	20706.19944	34.23612268	9754.369933	14.13282847	2440.700861	3.354350625	11504.54359	37.59594093	7370.735431	5.62008936	1144.398734	2.677385839	480.7864465	32.30594472	11007.36778	2.620461946	5520.190955	0	2572.666112	0.604856784	1.170550651	2.098698626	8.041673835	0.026696034	0.407463839	104369.9928	16561094.19
Jul-08	4.51	79.13307838	21038.27998	5.364913229	10683.6491	18.2684256	20724.46786	26.51355699	9780.88349	14.19825824	2454.899119	4.090450587	11508.63404	5.367617721	7376.103049	5.537151685	1149.935885	2.461707535	483.2481541	10.43741007	11017.80519	2.504978417	5522.695933	0	2572.666112	0.503900003	1.124640948	1.963995315	7.06923377	0.027571942	0.470570844	104498.8854	16665593.08
Aug-08	4.74	48.67974252	21086.95973	6.142436956	10689.79153	17.32187505	20741.78974	27.05782355	9807.941314	12.98126467	2467.880384	3.904521015	11512.53856	27.39080651	7403.493855	5.42627049	1155.362155	2.446833169	485.6949872	21.46641424	11039.2716	2.535403256	5525.231336	0	2572.666112	0.549308031	0.994699106	2.047376594	8.417630125	0.028567908	0.465838092	104676.4781	16770269.55
Sep-08	2.63	73.60848164	21160.56821	6.045709958	10695.83724	13.19063991	20754.98038	29.64622491	9837.587539	14.36837562	2482.248759	3.744218099	11516.28278	26.16372586	7429.657581	5.039727376	1160.401883	1.165.860099	2.201406134	40.91064432	11096.15187	2.302653237	5529.917759	0	2572.666112	0.566098296	1.202948172	2.148391363	9.821142178	0.023982535	0.466514199	104904.2505	16875173.8
Oct-08	3.65	82.60343809	21243.17165	5.435904582	10701.27315	14.76618856	20769.74657	26.51355699	9864.101096	12.00766982	2494.256429	3.620555855	11519.90333	27.3316471	7456.989228	5.45821613	1165.860099	2.201406134	49.40104446	32.87572889	11096.15187	2.302653237	5529.917759	0	2572.666112	0.439569866	1.126895256	1.916645771	8.821431045	0.028761905	0.446230973	105132.3348	16980306.14
Nov-08	4.88	77.99227565	21321.16392	5.218023476	10706.49117	14.35856115	20784.10513	23.02473306	9887.125829	13.03360848	2507.290037	3.211783415	11523.11512	29.36978417	7486.359012	6.270624763	1172.130724	2.295930329	492.696975	26.13101098	11122.28288	2.270085574	5532.187845	0	2572.666112	0.613700966	1.150374346	2.07022928	9.077510145	0.028402118	0.422839833	105324.1542	17085630.29
Dec-08	4.48	64.06118894	21385.22511	5.314205225	10711.80538	13.4410178	20797.54615	20.29336766	9907.419196	13.06239758	2520.352435	3.386284589	11526.5014	25.08358955	7511.442602	6.311125786	1178.441849	2.565828095	495.2628031	24.46664142	11146.74953	2.697669065	5534.885514	0	2572.666112	0.484754139	1.248322623	2.044899628	9.446237818	0.02135296	0.40515744	105482.6321	17191112.93
Jan-09	2.14	60.83303667	21446.05815	5.233072321	10717.03845	15.80063309	20813.34678	23.40346232	9930.822659	14.68505566	2535.037491	3.633063839	11530.13446	26.53045967	7537.973062	6.162044074	1184.603893	2.454270352	497.7170734	26.19916698	11172.94869	2.575969708	5537.461484	6.964343809	2579.630456	0.50474808	0.938944339	1.874846195	8.240060583	0.028325525	0.436495025	105689.2706	17296802.2
Feb-09	1.38	51.44711546	21467.59525	5.056411965	10722.09486	11.45631503	20824.80309	19.94473608	9950.767395	11.13876259	2546.176253	3.42590231	11533.56037	24.91565316	7562.888715	5.264195078	1189.868088	2.068976297	499.7860497	19.31268459	11192.26138	2.30958334	5539.771067	7.066675956	2586.697132	0.437306354	0.915253313	1.636005755	7.022794396	0.02475077	0.377429398	105820.0002	17402622.2
Mar-09	4.46	54.06765764	21551.57292	4.502876183	10726.59774	14.38756835	20839.19066	20.84101477	9971.60841	12.57560015	2558.751853	3.29839061	11536.85876	22.06814994	7584.956865	6.105251041	1195.97334	2.16422022	501.9502699	27.46686861	11219.72825	2.23740886	5542.008476	7.009882923	2593.707015	0.516039076	0.96548

PCE Removed (kg/month)

Month	PCE Monthly RWM-1	PCE Cumulative	PCE Monthly RWM-2	PCE Cumulative RWM-2 (cumulative)	PCE Monthly RWM-3	PCE Cumulative	PCE Monthly RWM-4	PCE Cumulative	PCE Monthly RWM-5	PCE Cumulative	PCE Monthly RWM-6	PCE Cumulative	PCE Monthly RWM-7	PCE Cumulative	PCE Monthly RWM-8 PCE	PCE Cumulative RWM-8 PCE (cumulative)	PCE Monthly RWM-9	PCE Cumulative RWM-9 (cumulative)	PCE Monthly RWM-10	PCE Cumulative RWM-10 (cumulative)	PCE Monthly RWM-11	PCE Cumulative RWM-11 (cumulative)	PCE Monthly RWM-12	PCE Cumulative RWM-12 (cumulative)	RWM-13b	RWM-13c	RWM-14b	RWM-14c	RWM-15b	RWM-17b	all wells /mo.	all wells accum.
Jan-87	161.3530632	161.3530632	29.42589019	29.42589019	66.54926467	66.54926467	0.004394699	0.004394699	1.426755926	1.426755926	95.93965922	95.93965922	2.900501325	2.900501325	0.224129648	0.224129648	0.666303976	0.666303976	111.0506626	111.0506626	49.59248769	49.59248769		0							1038.266226	1038.266226
Feb-87	155.7228323	317.0758955	22.42714123	51.85303143	51.80990231	118.359167	1.526694434	1.531089133	0.429611814	1.856367739	122.7706596	218.7103188	5.74342446	8.643925786	0.14534131	0.369470958	0.079388111	0.745692086	57.7090496	168.7597122	47.90767134	97.50015903		0							1451.676546	2489.942773
Mar-87	102.9373722	420.0132677	25.35403256	77.20706399	69.16580083	187.5249678	0.212973874	1.744063006	2.283215146	4.139582885	169.2128133	387.9231321	11.18112836	19.82505415	0.213649981	0.583120939	0.328419235	1.074111321	64.04428626	232.8039985	25.65828095	123.15844		0							1926.588775	4416.531548
Apr-87	104.0333207	524.0465884	25.04651268	102.2535767	62.02741386	249.5523817	0.264499811	2.008562817	2.407815222	6.547398107	141.7862931	529.7094252	6.93391897	26.75897312	0.188928436	0.772049375	0.272187808	1.346299129	54.61749337	287.4214919	30.52298372	153.6814237		0							2312.199538	6728.731085
May-87	116.8313821	640.8779705	35.25224688	137.5058236	70.22728966	319.7796713	0.161251647	2.169814464	4.978686861	11.52608497	115.6989019	645.4083271	7.058562666	33.81753578	0.048679743	0.820729118	0.475303597	1.821602726	85.95017039	373.3716622	83.56689133	237.248315		0							2924.596904	9653.327989
Jun-87	114.3875805	755.2655509	39.12699735	176.6328209	64.8147217	384.594393	0.392578569	2.562393033	2.447727376	13.97381234	117.4627793	762.8711064	7.616024233	41.43356002	0.152124195	0.972853313	0.198906475	2.020509201	82.44149943	455.8131617	31.30814086	268.5564559		0							3325.045697	12978.37369
Jul-87	88.02920106	843.294752	35.9993457	212.6321666	60.73473987	445.3291329	0.263681939	2.826074972	2.935996971	16.90980931	154.693404	917.5645104	7.606209769	49.03976978	0.223115487	1.1959688	4.203191518	6.223700719	117.8962514	573.7094131	33.56873911	302.125195		0							3877.00437	16855.37806
Aug-87	49.4403635	892.7351155	25.10049224	237.7326588	64.81504885	510.1441817	0.033805377	2.859880348	0	16.90980931	113.7212874	1031.285798	6.706986747	55.74675653	0.27990852	1.475877319	0.220580083	6.444280803	163.53351	737.2429231	24.64411965	326.7693147		0							4267.842698	21123.22075
Sep-87	78.84286255	971.577978	31.81522151	269.5478803	71.12705793	581.2712397	0.130859523	2.990739871	0.474038622	17.38384794	142.8331693	1174.118967	10.54727755	66.29403408	0.288545248	1.764422567	0.20839379	6.652674593	80.23324498	817.4761681	11.72828474	338.4975994		0							4675.804507	25799.02526
Oct-87	127.4268323	1099.00481	36.0238546	305.5717349	80.09338887	661.3646285	0.003380538	2.994120409	0.431018554	17.81486649	114.3137266	1288.432694	12.52489209	78.81892616	0.273823552	2.038246119	0.288190837	6.94086543	70.81381295	888.2899811	20.48605831	358.9836577		0							5172.93351	30971.95877
Nov-87	114.5675123	1213.572323	39.25785687	344.8295918	73.38602045	734.750649	0.163574404	3.157694813	0.465205604	18.28007209	109.1041272	1397.536821	10.72066641	89.53959258	0.242907989	2.281154108	0.539468383	7.480333813	81.06747444	969.3574555	2.658084059	361.6417418		0							5574.600327	36546.5591
Dec-87	113.7888981	1327.361221	38.63954563	383.4691374	2.746686861	737.4973359	0.169026884	3.326721696	0.35799894	18.68307103	141.9825824	1539.519403	8.975327527	98.51492011	0.201141992	2.4822961	4.527216055	12.00754987	184.5773571	1153.934813	2.831200303	364.4729421		0							6140.021393	42686.58049
Jan-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	48327.8049
Feb-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	53969.02931
Mar-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	59610.25372
Apr-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	65251.47813
May-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	70892.70255
Jun-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	76533.92696
Jul-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	82175.15137
Aug-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	87816.37578
Sep-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	93457.60019
Oct-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	99098.8246
Nov-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	104740.049
Dec-88	0	1327.361221	0	383.4691374	0	737.4973359	0	3.326721696	0	18.68307103	0	1539.519403	0	98.51492011	0	2.4822961	0	12.00754987	0	1153.934813	0	364.4729421		0							5641.224411	110381.2734
Jan-89	8.451344188	1335.812565	38.07330557	421.542443	79.94295494	817.4402908	2.486554487	5.813276183	0.982046195	19.62011723	86.76149943	1626.280903	4.149609996	102.6645301	0.513841727	2.996137827	0.446230973	12.45378084	87.92778493	1241.862598	9.997940174	374.4708822		0							6280.690636	116661.9641
Feb-89	5.416711852	1341.229277	21.22105263	442.7634956	39.76580992	857.2061007	1.488527073	7.301803256	0.062289133	19.68240636	34.02696554	1660.307868	3.549564559	106.2140947	0.446558122	3.442695949	0.717546384	13.17132722	67.1440212	1309.006619	4.475504733	378.946387		0							6317.586626	122979.5507
Mar-89	2.063818251	1343.293095	37.24000303	480.0034987	74.89412192	932.1002226	2.364009996	9.665813253	0.955001893	20.63740825	77.4988262	1737.806694	36.52332904	142.7374237	0.459753124	3.902449072	0.397213177	13.5685404	132.8551306	1441.861749	12.30515714	391.2515441		0							6894.384803	129873.9355
Apr-89	2.222976145	1345.516071	33.4084362	513.4119349	66.59113972	998.6913624	1.813385839	11.47919909	0.817872018	21.45528027	75.57137448	1813.378069	16.66496024	159.4023839	0.484180235	4.386629307	0.368696706	13.93723711	90.29307081	1532.15482	9.282029534	400.5335736		0							7111.864683	136985.8002
May-89	5.30744415	1350.823515	30.05128966	543.4632245	61.3567588	1060.048121	2.876837562	14.35603665	0.64652783	22.1018081	44.99833699	1858.376406	21.77404317	181.1764271	0.430342446	4.816971753	0.289881106	14.22711821	65.10915562	1597.263976	0.999794017	401.5333677		0							7282.027384	144267.8276
Jun-89	5.602423324	1356.425939	39.72240818	583.1856327	72.44056039	1132.488682	1.358321848	15.7143585	1.28634911	23.38815721	61.64792124	1920.024327	24.99416888	206.170596	0.634668686	5.451640439	0.866944339	15.09406255	89.40976903	1686.673745	8.006149186	409.5395168		0							7660.126341	151927.9539
Jul-89	58.21285877	1414.638797	29.96001515	613.1456479	58.56781522	1191.056497	4.502876183	20.21723468	2.431282696	25.81943991	123.0515714	2043.075899	2.528642181	208.6992382	0.845979553	6.297619992	0.209593336	15.30365589	136.9117758	1823.585521	9.261828095	418.8013449		0							8207.125133	160135.079
Aug-89	43.43314805	1458.071945	38.32684589	651.4724938	73.46246422	1264.518961	3.287234835	23.50446952	1.056418023	26.87585793	86.66346384	2129.739362	20.63649224	229.3357304	0.487473533	6.785093525	0.003126997	15.30678289	70.07854601	1893.664067	8.316967815	427.1183128		0							8472.145258	168607.2243
Sep-89	77.73055661	1535.802502	33.74703521	685.219529	50.37764483	1314.896606	1.883395683	25.3878652	1.112305945	27.98816388	56.26632336	2186.005686	17.22111321	246.5568436	0.492358955	7.27745248	0.00261719	15.30940008	80.2823173	1973.946384	4.784551306	431.9028641		0							8774.193515	177381.4178
Oct-89	100.4864824	1636.288984	37.03717077	722.2566997	27.69167437	1342.588828	3.372086331	28.75995153	1.653082923	29.6412468	54.58047103	2240.586157	17.17989246	263.7367361	0.360872397	7.638324877	0.00270443	15.31210451	75.14935252	2049.095736	5.735082166	437.6379462		0							9096.791039	186478.2088
Nov-89	82.0652783	1718.354263	35.25191973	757.5086195	59.67194245	1402.260223	3.558724725	32.31867626	1.128663385	30.76991019	179.5158273	2419.601984	27.02903446	290.7657705	1.101182885	8.739507762	0.00261719	15.3147217	241.4358198	2290.531556	5.922211284	443.5601575		0							10045.90861	196524.1174
Dec-89	97.96798183	1816.322245	36.9323741	794.4409936	46.57028701	1448.83051	5.447060356	37.76573661	0.851895494	31.62180568	71.49837183	2491.100356	22.3740886	313.1398591	0.697235895	9.436743658	0.046144339	15.36086604	91.1731011	2381.704657	5.284625521	448.844783		0							10167.41172	206691.5292
Jan-90	45.63725861	1861.959503	35.02744112	829.4684347	62.45543355	1511.285943	2.116216585	39.8819532	4.629646346	36.25145203	64.32318061	2555.423537	27.38742598	340.5272851	0.411073381	9.847817039	0.39974858	15.76061462	0	2381.704657	0	448.844783		0							10273.3434	216964.8726
Feb-90	39.27116092	1901.230664	19.52336842	848.9918031	35.20252026	1546.488463	1.603029156	41.48498236	0.14534131	36.39679334	32.81171677	2588.235253	11.35860659	351.8858917	0.347322984	10.19514002	0.320605831	16.08122045	0	2381.704657	0	448.844783		0							10312.12332	227276.9959
Mar-90	19.95024309	1921.180907	35.68833624	884.6801393	77.43290572	1623.921369	24.77436969	44.23234532	4.584009087	40.98080242	86.79868535	2675.033939	19.74234002	371.6282317	0.373549413	10.56868944	0.169026884	16.25024733	0	2381.704657	0	448.844783		0							10666.51257	237943.5085
Apr-90	117.7735706	2038.954478	39.50321848	924.1833578	50.14536918	1674.066738	1.472169633	45.70451496	9.343369936	50.32417236	43.42900417	2718.462943	28.75147293	400.3797047	0.071972738	10.64066217	0.581507005	16.83175434	12.37931087	2394.083968	73.15047331	521.9952563		0							11172.22899	249115.7375
May-90	44.16672473	2083.121203	36.8512412	961.034599	27.68322302	1701.749961	1.531383567	47.23589852	11.1574646	61.48163696	60.85981977	2779.322763	14.69519727	415.0749019	0.777861719	11.41852389	0.021804468	16.8535588	75.45360091	2469.537569	81.74140098	603.7366573		0							11505.50699	260621.2445
Jun-90	77.12533131	2160.246534	35.72464975	996.7592488	59.44948126	1761.199443	4.506801969	51.74270049	8.57129875	70.05293571	61.89982582	2841.222588	36.36422567	451.4391276	0.889844756	12.30836865	0.021591821	16.87515062	57.90533889	2527.442908	5.50755017	609.2442075		0							11846.49915	272467.7436
Jul-90	9.446912533	2169.693446	36.55037334	1033.309622	23.9527997	1785.152242	2.785901098	54.52860159	7.91045816	77.96339387	54.56187808	2895.784466	9.107168497	460.5462961	0.693686331	13.00205498	0.022818629	16.89796925	29.91268762	2557.355596	3.732113593	612.9763211		0							11855.88681	284323.6304
Aug-90	110.5604847	2280.253931	37.92963271	1071.239255	28.21396744	1813.36621	4.502369103	59.03097069	7.440563423	85.40395729	46.19166679	2941.976133	8.11329042	468.6595865	0.843782204	13.84583718	0.031100947	16.9290702	32.72698523	2590.082581	4.85614237	617.8324635		0							12240.02998	296563.6604
Sep-90	87.28330178	2367.537233	59.98273381	1131.221989	50.70806513	1864.074275	4.800581598	63.83155229	10.25497009	95.65892738	180.5861416	3122.562275	8.82647482	477.4860613	1.266720182	15.11255736	1.181334343	18.11040454	0	2590.082581	1.063233624	618.8956971		0							12770.52711	309334.1875
Oct-90	92.15345702	2459.69069	35.14406967	1166.366058	42.88212041	1906.956395	5.333812344	69.16536463	8.733928815	104.3908562	67.82710791	3190.389383	33.88819992	511.3742613	1.191977584	16.30453495	0.468711549	18.57911609	155.1666793	2745.24926	5.625214691	624.5209118		0							13261.40011	322595.5876
Nov-90	92.97569103	2552.666381	39.87943961	1206.245498	49.50906475	1956.46546	6.373185914	75.53855055	9.636168118	114.0270243	54.54388489	3244.933268	29.05081409	540.4250754	1.104290799	17.40882575	0.161775085	18.74089118	55.05914426	2800.308404	7.017341916	631.5382537		0							13503.60843	336099.196
Dec-90	103.1740098	2655.840391	34.09441272	1240.339911	41.52483453	1997.990295	4.464845134	80.00339568	8.213016282	122.2400406	61.99906096	3306.932329	39.28184778	579.7069231	1.373681484	18.78250723	0.083668307	18.82455949	53.85196516	2854.16037	3.614639909	635.1528936		0							13861.6496	349960.8456
Jan-91	85.18954941	2741.02994	38.68180235	1279.021713	43.94698978	2041.937284	4.833323741	84.83671942	6.611317531	128.8513581	62.7563014	3369.68863	11.71356304	591.4204862	1.805207119	20.58771435	0.07268156	18.89724105	42.09783567	2896.258205	5.597832336	640.7507259		0							14116.58642	364077.4321
Feb-91	81.20487694	2822.234817	20.85769936	1299.879412	33.01324044	2074.950525	4.98923741	89.82595683	6.63501401	135.4863721	49.69695721	3419.385587	23.57826884	614.998755	1.172501325	21.76021568	0.098471791	18.99571284	45.33366452	2941.59187	3.975817645	644.7265436		0							14354.39152	378431.8236
Mar-91	76.46776221	2898.702579	28.96275653	1328.842169	34.78573268	2109.736257	5.092780008	94.91873684	7.80904203	143.2954142	62.35063688	3481.736224	36.50980689	651.5085619	1.9987429	23.75895858	0.114093147	19.10980598	48.96370769	2990.555577	3.234498448	647.961042		0							14696.41489	393128.2385
Apr-91	41.50864067	2940.21122	28.10371829	1356.945887	28.53719046	2138.273448	2.723840969	97.64257781	6.369587278	149.6650014	42.50317304	3524.239397	37.49125331	688.9998152	1.273917456	25.03287603	0.075244226	19.18505021	36.23500189	3026.790579	2.690471791	650.6515138		0							14845.14941	407973.3879
May-91	62.11737978	3002.3286	34.32766982	1391.273557	42.79760697	2181.071055	2.327500189	99.970078	7.511554714	157.1765562	67.05634532	3591.295743	37.32113593	726.3209512	2.037788111	27.07066414	0.136911776	19.32196198	34.48148429	3061.272064	4.381176827	655.0326906		0							15206.63047	423180.0183
Jun-91	114.3875805	3116.71618	31.71544112	1422.988998	33.86971602	2214.940771	5.204119652	105.1741977	8.229428247	165.4059844	59.67521393	3650.970956	34.21976524	760.5407164	1.91447482	28.98513896	0.103051874	19.42501386	53.32525559	3114.597319	1.046876183	656.0795668		0							15599.51577	438779.5341
Jul-91	90.81814464	3207.534325	28.53511852	1451.524117	35.16604317	2250.106814	7.072760924	112.2469586	7.050449375	172.4564338	61.46831655	3712.439273	30.85078682	791.3915032	2.485709353	31.47084832	0.121699356	19.54671321	39.75681333	3154.354133	4.409066263	660.4886331		0							15871.29466	454650.8288
Aug-91	84.88530102	3292.419626	25.26951912	1476.793636	37.79610148	2287.902916	6.916580083	119.1635387	9.659886407	182.1163202	66.0759894	3778.515262	35.86074366	827.2522469	2.631072473	34.10192079	0.106486937	19.65320015	38.59559864	3192.949731	6.648503446	667.1371365		0							16192.45132	470843.2801
Sep-91	118.1661492	3410.585775	39.50321848	1516.296854	38.10629307	2326.009209	5.922374858	125.0859135	11.3357017	193.4520264	80.24305945	3858.758322	39.82382431	867.0760712	5.13198334	39.23390413	0.079170011	19.73237016	65.83869746	3258.788429	4.041105642	671.1782422		0							16694.3887	487537.6688
Oct-91	56.79303294	3467.378808	23.81250738	1540.109362	29.00501325	2355.014222	5.408015146	130.4939287	9.735948504	203.1879749	59.3284362	3918.086758	36.6450284	903.7210996	2.357925028	41.59182916	0.054426657	19.78679682	40.5664521	3299.354881	3.202045286	674.3802875		0							16820.01478	504357.6836
Nov-91	41.55237001	3508.929978	25.85780976	1554.368142	50.91605537	2405.937247	3.373447518	133.8986796	6.830867096	209.6108842	131.4647482	4049.551506	62.01582734	904.3246823	2.205331011	43.79713927	0.085082317011	19.86598211	43.14082166	3342.396214	14.30382166	677.5323696		0							17131.38573	521510.0659
Dec-91	58.41569103	3567.345669	25.27289966	1579.641040	30.82881333	2435.936061	6.008905718	143.3536576	9.533116244	219.5519582	62.87800476	4112.429507	38.47051874	942.8132011	2.246029231	46.0431685	0.11662855	19.98259538	56.46343052	3398.859644	5.493373722	683.0167434		0							17444.70065	538955.7699
Jan-92	55.67745551	3623.023125	33.62958879	1613.270631	34.03542234	2469.971483	7.142230973	150.4958885	8.897571561	228.4495334	62.26950398	4174.699011	45.3668156	988.1800167	2.253466414	48.29663491	0.038876183	20.02147156	41.89500341	3440.754647	0.054933737	683.0716771		0							17731.49499	556687.2649
Feb-92	39.65436123	3662.677486	26.38127982	1639.651911	26.95134752	2496.92283	4.939619841	155.4355084	7.318973116	235.7685065	47.44966301	4222.148674	30.22854979	1018.408566	2.63324256	50.92987747	0.049159561	20.07063112	43.98101325	3484.735661	0.049617569	683.1212947		0							17899.50777	574586.7727
Mar-92	39.5522908	3702.229777	33.50788944	1673.1598	35.76760984	2532.69044	5.833962893	161.2694713	8.444752139	244.2132586	57.40152972	4279.550204	34.7519273	1053.160494	2.692260204	53.62213768	0.085527603	20.15615873	45.66092238	3530.396583	6.712902688	689.8341973	0.045637259	0.045637259							18210.78537	592797.5581
Apr-92	71.98909504	3774.218872	32.70179477	1705.861595	24.53616055	2557.226601	3.59863688	164.8681081	7.802499053	252.0157577	67.22907989	4346.779284	35.27809163	1088.438585	2.648596744	56.27073442	0.073608482	20.22976721	45.63235138	3576.028934	5.234380916	695.0685783		0							18542.17357	611339.7317
May-92	78.0904203	3852.309292	52.73638773	1758.597983	38.33529724	2595.561898	7.883413858	172.751522	9.279575918	261.2953336	107.5010981	4454.280382	54.71400227	1143.152588	4.529244377	60.7999788	0.070602098	20.30582931	88.78982204	3664.818757	2.70443014	697.7730084	2.281862931	2.281862931							19135.0941	630474.8257
Jun-92	84.40439228	3936.713684	27.99085195	1786.588835	26.3027641	2621.864662	5.22522075	177.9767427	9.490586899	270.7859205	66.14948883	4520.429871	37.95744036	1181.110028	2.950882242	63.75086104	0.036804241	20.34263355	50.88799697	3715.706754	1.308595229	699.0816036	1.124574025	7.650483908							19315.83168	649790.6574
Jul-92	102.8359561	4039.54964	55.9817039	1842.570538	42.08769406	2663.952356	7.91045816	185.8872009	2.837961378	273.6238819	77.48192351	4597.911794	45.29920485	1226.409233	3.584722151	67.33558319	0.062201893	20.40483544	41.92542825	3757.632182	4.284831503	703.3664351	0.016902688	7.667386596							19770.62006	669561.2775
Aug-92	81.1329042	4120.682544	52.3307321	1894.901262	31.91227565	2695.864632	7.325625142	193.2128261	9.097026884	282.7209087	85.18954941	4683.101343	44.95777054	1271.367003	3.554973419	70.89055661	0.275851874	20.68068732	53.27389322	3810.906075	3.076289284	706.4427244	0.44982961	8.117216206							20131.46449	689692.742
Sep-92	74.42635365	4195.108898	48.28716395	1943.188426	48.95781901	2744.822451	31.16419538	224.3770214	6.659113972	289.3800227	19.97734192	4703.078685	41.84887543	1313.215879	4.332758803	75.22331541	0.039257857	20.71994517	61.28805755	3872.194133	4.110624763	710.5533492	0.46482393	8.582040136							20442.00055	710134.7425
Oct-92	67.6107535	4262.719652	0	1943.188426	25.25599697	2770.078448	4.700637637	229.0776591	8.708265051	298.0882878	70.3827944	4773.46148	38.26768648	1351.483565	4.000866339	79.22418175	0.040566452	20.76051162	54.55680727	3926.75094	5.820440742	716.3737899	0.297487315	8.879527452							20659.72877	730794.4713
Nov-92	60.52252934	4323.242181	0	1943.188426	35.38441499	2805.462863	5.299810678	234.3774697	7.750155244	305.838443	59.47565316	4832.937133	35.92093904	1387.404504	2.253494888	82.47767664	0.039257857	20.79976948	56.57547899	3983.326419	1.451722832	717.8255128	0.43347217	9.312999621							20912.30033	751706.7716
Dec-92	81.1329042	4404.375085	0	1943.188426	25.98788338	2831.450746	6.343578947	240.7210487	9.641293449	315.4797365	51.6208103	4884.557943	38.33529724	1425.739802	4.360893601	86.83857024	0.113586006	20.91335555	47.59797047	4030.924389	4.644316852	722.4698644	0.456372586	9.769372207							21186.66328	772893.4349
Jan-93	65.1776524	4470.092738	44.62309731	1987.811523	36.2055585	2867.656305	6.465278304	247.186327	8.008493752	323.4882302	52.73638773	4937.294331	55.42898599	1481.168788	3.841135933	90.67970617	0.09110549	21.00446104	60.29019917	4091.214588	3.720282171	726.1901462	0.351684968	10.12105718						0	21591.38806	794484.823
Feb-93	64.12116622	4534.213904	29.31253313	2017.124056	32.22088603	2899.877191	4.637334343	251.8236613	7.893010223	331.3812404	188.5772965	5125.871627	36.05441575	1517.223203	3.400711852	94.08041802	0.080609466	21.0850705	48.38705339	4139.601642	3.251859144	729.4420053	0.422567209	10.54362438						0	22090.62709	816575.45
Mar-93	76.06209769	4610.276002	32.07285119	2049.196907	27.68660356	2927.563794	7.225899281	259.0495606	9.40803635	340.7892768	59.83551685	5185.707144	40.5664521	1557.789655	3.4211104127	97.50152215	0.064906323	21.14997683	66.11317531	4205.714817	2.484695191	731.9267005	0.46482393	11.00844832						0	22323.07997	838898.53
Apr-93	71.05672094	4681.332722	32.73123817	2081.928145	51.3868989	2978.950693	8.833017796	267.8825784	8.

Month	PCE Monthly RWM-1	PCE Cumulative	PCE Monthly RWM-2	PCE Cumulative RWM-2 (cumulative)	PCE Monthly RWM-3	PCE Cumulative	PCE Monthly RWM-4	PCE Cumulative	PCE Monthly RWM-5	PCE Cumulative	PCE Monthly RWM-6	PCE Cumulative	PCE Monthly RWM-7	PCE Cumulative	PCE Cumulative RWM-8 PCE	PCE Cumulative RWM-8 PCE (cumulative)	PCE Monthly RWM-9	PCE Cumulative RWM-9 (cumulative)	PCE Monthly RWM-10	PCE Cumulative RWM-10 (cumulative)	PCE Monthly RWM-11	PCE Cumulative RWM-11 (cumulative)	PCE Monthly RWM-12	PCE Cumulative RWM-12 (cumulative)	RWM-13b	RWM-13c	RWM-14b	RWM-14c	RWM-15b	RWM-17b	all wells /mo.	all wells accum.
Jun-95	27.75366906	5641.058099	43.26542976	2849.696669	33.70287012	3565.622614	11.07071564	403.1515874	5.172222643	485.850324	0	6296.33776	44.20189322	2425.610263	4.553911397	160.086632	0	22.46445801	32.92752745	5130.102888	1.65406437	802.3718549	0.482544491	39.13202181						0	28026.27002	1524079.744
Jul-95	44.96115108	5686.01925	44.70761075	2894.40428	32.29765695	3597.920271	8.437822037	411.5894095	4.999815222	490.8501392	0	6296.33776	50.04886028	2475.659123	4.329623627	164.4162557	0	22.46445801	34.8330602	5164.935949	2.750743506	805.1225984	0.481726619	39.61374843						0	28277.18131	1552356.925
Aug-95	0	5686.01925	0	2894.40428	0	3597.920271	0	411.5894095	0	490.8501392	0	6296.33776	0	2475.659123	0	164.4162557	0	22.46445801	0	5164.935949	0	805.1225984	0	39.61374843						0	28049.33324	1580406.259
Sep-95	23.12942067	5709.148671	33.25794775	2927.662228	21.37590307	3619.296174	13.3313139	424.9207234	6.716692162	497.5668314	179.4574782	6475.795238	56.73741764	2532.396541	9.127451723	173.5437074	0.008015146	22.47247315	57.05475199	5221.9907	1.46464521	806.5872436	0.46482393	40.07857236						0	28853.58497	1609259.843
Oct-95	35.64776978	5744.796441	243.3649072	3171.027135	98.28237183	3717.578546	9.898214313	434.8189377	5.224959031	502.7917904	218.6362741	6694.431512	21.34471488	2553.741256	6.608905718	179.5526131	0.010932659	22.48340581	31.04685801	5253.037559	14.23882469	820.8260683	12.98971602	53.06828838						0	29844.848	1639104.691
Nov-95	81.42733813	5826.223779	22.49802348	3193.525159	9.306074972	3726.884621	49.62193109	484.4408688	14.8394699	517.6312603	101.5797047	6796.011217	40.19023097	2593.931487	4.357622113	183.9102352	0.00817872	22.49158453	33.7912003	5286.828759	1.413282847	822.2393512	0.247324498	53.31561287						0	29866.71432	1668971.406
Dec-95	28.35764029	5854.581419	0	3193.525159	21.06413025	3747.948752	5.739645892	490.1805147	4.787179402	522.4184397	67.91500189	6863.926219	27.25389474	2621.185381	3.747664067	187.6578993	0.016564635	22.50814917	51.59545627	5338.424215	1.175751003	823.4151022	0	53.31561287						0	29930.73979	1698902.146
Jan-96	35.59706172	5890.178481	0	3193.525159	21.34302461	3769.291776	53.00683075	543.1873454	5.540870276	527.95931	0	6863.926219	36.91547141	2658.100853	3.506462704	191.164362	0.042256721	22.55040589	60.10595986	5398.530175	1.233896251	824.6489984	0	53.31561287	0	0	0	0	0	0	30153.67053	1729055.816
Feb-96	13.63032791	5903.808809	0	3193.525159	17.17836577	3786.470142	48.09087467	591.2782201	4.406192806	532.3655028	0	6863.926219	40.77495494	2698.875808	3.448192048	194.612554	0.007633472	22.55803936	75.26603559	5473.796211	1.076319576	825.725318	0	53.31561287	0	0	0	0	0	0	30344.13649	1759399.953
Mar-96	29.86705036	5933.675859	0	3193.525159	19.80149943	3806.271641	55.32587959	646.6040997	4.63809769	537.0036005	0	6863.926219	47.40189928	2746.277707	3.638810754	198.2513648	0.015550473	22.57358983	79.50010451	5553.296315	0.877925634	826.6032436	0	53.31561287	18.86340023	31.96298372	22.00730027	19.91136691	12.57560015	0	30727.71188	1790127.664
Apr-96	29.88504354	5963.560903	0	3193.525159	17.9931844	3824.264826	41.11769784	687.7217975	5.02500568	542.0286061	144.5997728	7008.525992	52.39615297	2798.67386	3.533207119	201.7845719	0.040893601	22.61448344	67.44172662	5620.738042	1.374024991	827.9772686	0.190836804	53.50644968	0	0	0	0	0	0	31108.5195	1821236.184
May-96	21.74404317	5985.334946	0	3193.525159	19.3366755	3843.601501	54.68357743	742.4053749	6.855730405	548.8843365	111.12233	7119.648322	46.31336615	2844.987226	4.198627793	205.9831997	0.008282317	22.62276575	82.9228989	5703.660941	1.825490345	829.802759	0.236637637	53.74308732	21.48331693	36.15485044	25.1512003	23.05526694	14.14755017	0	31563.46946	1852799.653
Jun-96	28.06282469	6013.397771	0	3193.525159	3.435062476	3847.036564	54.01881106	796.424186	3.572464975	552.4568015	44.18144642	7163.829768	0	2844.987226	2.237697842	208.2208975	0.040893601	22.66365935	71.93020825	5775.591149	1.210450587	831.0132095	0	53.74308732	34.67613783	44.87173041	11.0952518	28.66804998	0.45539114	0	31631.3459	1884430.999
Jul-96	34.38006816	6047.777839	0	3193.525159	12.13951079	3859.176075	22.05462779	818.4788138	3.107390231	555.5641917	53.18092844	7217.010697	0	2844.987226	2.380743658	210.6016412	0.008282317	22.67194167	74.99384778	5850.584997	1.233896251	832.2471058	0	53.74308732	19.75079137	30.80514956	11.83695267	18.89382507	0.479191215	0	31791.61398	1916222.613
Aug-96	22.52790307	6070.305742	0	3193.525159	15.40849072	3874.584565	37.88906626	856.36788	4.267590761	559.8317825	41.7056933	7258.71639	0	2844.987226	0	210.6016412	0.008282317	22.68022399	59.90481787	5910.489814	1.233896251	833.481002	0	53.74308732	24.809766	46.18490572	9.550018932	31.4592836	0.56843741	0	31984.83267	1948207.446
Sep-96	29.46302158	6099.768763	0	3193.525159	9.685240439	3884.269806	44.75395683	901.1218369	4.192739114	564.0245216	40.6482393	7299.364629	0	2844.987226	0	210.6016412	0.008015146	22.68823913	56.35465354	5966.844468	0.117773571	833.5987756	0	53.74308732	0	0	0	0	0	0	32059.76179	1980267.208
Oct-96	28.73457024	6128.503334	85.18954941	3278.714708	15.82091632	3900.090722	54.02099205	955.1428289	5.163771299	569.1882929	89.20731844	7388.571948	48.67974252	2893.666969	3.941706929	214.5433481	0	22.68823913	86.13609996	6052.980568	0	833.5987756	0	53.74308732	21.34471488	38.48742143	13.00323817	36.05005377	0.237313745	0	32817.45023	2013084.658
Nov-96	30.03226051	6158.535594	81.46005301	3360.174761	17.27345702	3917.364179	43.26542976	998.4082587	4.881878076	574.070171	37.27860659	7425.850554	52.84761833	2946.514587	3.389915941	217.9332641	0	22.68823913	68.91389625	6121.894464	0	833.5987756	0	53.74308732	24.66374858	45.03366906	13.22499053	42.66347596	0	0	33095.70493	2046180.363
Dec-96	25.37093525	6183.906529	53.75054903	3413.92531	18.74846195	3936.112641	135.7607028	1134.168961	4.909554866	578.9797259	48.92314123	7474.773695	49.69390382	2996.208491	3.692223249	221.6254873	0	22.68823913	74.11490799	6196.009372	1.020077243	834.6188529	0.10141613	53.84450345	17.25595456	56.6814752	13.8314699	54.73766604	0	0	33605.45425	2079785.817
Jan-97	30.50935252	6214.415882	65.92048466	3479.845795	17.95065505	3954.063296	4.789545778	1138.958507	5.48154184	584.4612677	12.27135176	7487.045047	62.62446043	3058.832951	4.43526543	226.0607527	0.01703791	22.70527704	74.70988262	6270.719255	1.128085422	835.7469383	0.376221128	54.22072457	0.18660568	0.56201438	0	0.353266187	0.004394699	0	33608.39586	2113394.213
Feb-97	29.00719424	6243.423076	68.39591064	3548.241705	18.9101098	3972.994307	4.816720939	1143.775228	5.238080603	589.6993563	56.06021961	7543.105267	52.9915638	3111.824515	4.231996971	230.2927497	0.024015653	22.72301927	54.45719046	6325.176445	1.114469937	836.4614252	0.11616855	54.33152187	0.131906399	0.529381295	0.340834532	0.311827338	0.003969406	0	33919.15547	2147313.369
Mar-97	30.42483908	6273.847915	0	3548.241705	20.55366906	3993.547976	4.924767285	1148.699995	5.434442635	594.2427989	44.31884892	7587.424116	51.41797804	3163.242493	4.016078758	234.3088285	0	22.7301927	59.15940931	6384.335855	0.988131162	837.8495564	0.11662855	54.45398167	0	0.562014388	0.377352518	0.353266187	0.004563726	0	34064.6864	2181378.065
Apr-97	31.07913669	6304.927052	58.88678531	3607.128491	13.74024991	4007.288226	4.420598258	1153.120594	3.297659977	597.5404589	29.59060962	7617.014725	45.1465354	3208.389028	2.878909504	237.187738	0.016030292	22.74622299	44.98296	6429.318816	0.730196138	838.5797525	0.105341916	54.55932359	0.164882999	0.543884892	0.365179856	0.334100719	0.00408936	0	34314.08758	2215692.153
May-97	26.33438849	6331.26144	56.79303294	3663.921524	16.49702385	4023.78525	4.942346081	1158.06294	3.644219614	601.1846785	37.89582734	7654.910553	40.22839833	3248.617427	2.826129496	240.0138675	0.017325256	22.76354824	62.53994699	6491.858763	0.649063234	839.2288158	0.202832261	54.76215585	0.324531617	0.562014388	0.190662325	0.34523741	0.004225672	0	34584.36817	2250276.521
Jun-97	35.33207119	6366.593512	64.03937902	3727.960903	0	4023.78525	3.406436956	1161.469377	3.446512685	604.6311912	22.90041651	7677.810969	35.54471791	3284.162145	3.16516471	243.1790322	0.020438622	22.78398687	74.58992806	6566.448691	0	839.2288158	0.112866339	54.87502219	0.337617569	0.536115108	0.365179856	0.334100719	0.00408936	0	34817.06393	2285093.585
Jul-97	21.19597122	6387.789483	44.01460053	3771.975503	0	4023.78525	4.616462249	1166.085839	0	604.6311912	0	7677.810969	0	3284.162145	0	243.1790322	0	22.78398687	0	6566.448691	0	839.2288158	0	54.87502219	0	0	0	0	0	0	34712.58296	2319806.168
Aug-97	26.33438849	6414.123871	47.32752745	3819.303031	14.19825824	4037.983508	4.439322075	1170.525161	3.574918591	608.2061098	33.97440363	7711.785373	17.74782279	3301.909967	1.123616812	246.302649	0.021905884	22.80589275	61.52578569	6627.974476	0.816061795	840.0448775	0.106323362	54.98134555	0.450456645	0.287345702	0.51637713	0.370675956	0.01056418	0	35070.77202	2354876.94
Sep-97	1.616115108	6415.739986	64.12116622	3883.424197	12.54615676	4050.529665	4.151518364	1174.676679	4.248027262	612.4541371	43.18364256	7754.969015	52.65460053	3354.564568	3.742582355	250.0452314	0.016929951	22.8228227	71.07307838	6699.047555	0.767163953	840.8120415	0.109630837	55.09097639	0.130532374	0.280693677	0.099943961	0.400920863	0	0	35373.31958	2390250.259
Oct-97	34.49172732	6450.231714	63.89216206	3947.316359	10.96984476	4061.49951	3.887618326	1178.564298	3.270670201	615.7248073	38.14936766	7793.118383	50.03195759	3404.596526	3.634078001	253.6793094	0.017494282	22.84031698	70.28137827	6769.328933	0.758085574	841.5701271	0.11662855	55.20760494	0.134883453	0.664782734	0.103275426	1.30826808	0.01817039	0	35675.40828	2425925.667
Nov-97	35.33207119	6485.867785	48.58159788	3995.897975	10.25611511	4071.755625	5.869049602	1184.433347	3.382718667	619.1075259	42.36577054	7835.484154	50.83892465	3455.43545	3.376175691	257.055485	0.016561908	22.85687889	66.24763347	6835.576566	0.7336312	842.3037583	0.112866339	55.32047128	0.435925786	0.620764862	0.489087467	0.87921242	0.019628928	0	35930.34874	2461856.016
Dec-97	24.4243847	6509.98817	54.76471034	4050.662667	0	4071.755625	4.369344945	1188.802692	4.62457554	623.7321015	104.5938357	7940.077989	32.75741007	3488.198286	2.979943961	260.035429	0	22.85687889	43.81176827	6879.388335	0	842.3037583	0.11662855	55.43709983	0.450456645	1.457856872	0.51637713	0.9085195	0.016902688	0	36209.02632	2498065.043
Jan-98	32.55153533	6542.539705	53.725195	4104.387862	0	4071.755625	6.252473457	1195.055166	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	0	6879.388335	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36118.29201	2534183.335
Feb-98	31.61784173	6574.157547	32.310961	4136.698823	0	4071.755625	2.628967815	1197.684134	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	0	6879.388335	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36158.87835	2570342.213
Mar-98	29.73858993	6603.896137	54.05479743	4190.753621	0	4071.755625	5.243213934	1202.927348	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	67.77978039	6947.168115	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36405.95334	2606748.166
Apr-98	39.45414616	6643.350283	53.16168118	4243.915302	0	4071.755625	3.842769973	1206.774617	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	0	6947.168115	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36442.06316	2643190.229
May-98	57.19869746	6700.54898	56.47188186	4300.387184	0	4071.755625	4.528230216	1211.302848	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	0	6947.168115	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36581.99768	2679772.227
Jun-98	40.4028777	6740.951858	65.80598258	4366.193166	0	4071.755625	5.04136312	1216.344211	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	71.15486558	7018.322981	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36828.60905	2716600.836
Jul-98	37.52396819	6778.475826	44.67887618	4410.872042	0	4071.755625	0	1216.344211	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	34.45443998	7052.777421	0	842.3037583	0	55.43709983	0	0	0	0	0	0	36879.51853	2753480.355
Aug-98	38.5381295	6817.013956	42.71647406	4453.588516	0	4071.755625	6.490632336	1222.834843	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	36.65178947	7089.42921	0	842.3037583	0	55.43709983	0	0	0	0	0	0	37011.65529	2790492.01
Sep-98	36.96781522	6853.981771	46.81499432	4500.403511	0	4071.755625	3.997758425	1226.832602	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	42.48354411	7131.912754	0	842.3037583	0	55.43709983	0	0	0	0	0	0	37147.78649	2827639.796
Oct-98	55.44081787	6909.422589	63.43578947	4563.8393	0	4071.755625	5.322656569	1232.155258	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	53.52743355	7185.440188	0	842.3037583	0	55.43709983	0	0	0	0	0	0	37372.97577	2865012.772
Nov-98	52.34380916	6961.766398	54.76471034	4618.604011	0	4071.755625	5.30471791	1237.459976	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	38.42035593	7223.860544	0	842.3037583	0	55.43709983	0	0	0	0	0	0	37496.91626	2902509.688
Dec-98	52.02647482	7013.792873	78.03971223	4696.643723	0	4071.755625	4.051574404	1241.51155	0	623.7321015	0	7940.077989	0	3488.198286	0	260.035429	0	22.85687889	56.97389171	7280.834435	0	842.3037583	0	55.43709983	0	0	0	0	0	0	37728.26598	2940237.954
Jan-99	37.18929496	7050.982168	44.5237095	4741.167432	9.264718455	4081.020343	11.43280939	1252.94436	3.578603378	627.3107049	29.75633775	7969.834327	35.07994087	3523.272801	2.593717531	262.6291465	0.062472336	22.91935123	40.62983718	7321.464273	0.715034426	843.0187927	0.128242332	55.56534216	0.341434305	0.267079379	0.093100008	0.250835895	0.007268156	0	37968.04348	2978205.998
Feb-99	42.53370693	7093.515875	37.87179281	4779.039225	7.191784203	4088.212127	4.611655343	1257.556015	3.1504561	630.461161	27.58294101	7997.417268	39.37894555	3562.651747	2.822262598	265.4514091	0.041861961	22.96121319	46.28479515	7367.749068	0.51956465	843.5383573	0.140799394	55.70614155	0.312209012	0.243339826	0.084823143	0.229233169	0.006625854	0	38177.2664	3016383.264
Mar-99	50.47480803	7143.990683	58.4494964	4837.488722	9.511565316	4097.723693	10.30793548	1267.863951	5.158142704	635.6193037	46.40058402	8043.817852	59.68778735	3622.339534	3.354169481	268.8055786	0	22.96121319	63.2718334	7431.020901	0	843.5383573	0.140799394	55.84694095	0.168756441	0.271355759	0.094317001	0.254977054	0.00742028	0	38578.57068	3054961.835
Apr-99	51.77129875	7195.761981	60.81696327	4898.305685	10.9615788	4108.685271	8.528769406	1276.39272	5.676686104	641.2959938	37.7284362	8081.546288	51.18406664	3673.523601	3.682550549	272.4881292	0.045342825	23.00655601	57.30829231	7488.329193	0.516044529	844.0544019	0.097250435	55.94419138	0.228578872	0.261849905	0.091274517	0.246571988	0.007148201	0	38848.48689	3093810.322
May-99	31.79395683	7227.555938	50.57284362	4948.878528	9.401275275	4118.086627	6.853195002	1283.245915	4.426814086	645.7228038	35.14068913	8116.686977	39.93260124	3713.456202	3.323913669	275.8120428	0.040505784	23.05363131	49.04840059	7537.374034	0.592270201	844.6466721	0.165646346	56.10983773	0.076417054	0.272133283	0.095533995	0.260301401	0.007538599	0	39022.63614	3132832.958
Jun-99	51.29693298	7278.852871	61.83112457	5010.709653	15.26149186	4133.348039	10.16451344	1293.410429	4.68068156	650.4034854	45.60454373	8162.291521	60.30006816	3773.75627	7.486146157	283.298189	0.045735403	23.09934985	63.78420295	7601.158237	0.73637925	845.3830513	0.144272624	56.25411035	0.094807724	0.321979856	0.091863385	0.688615524	0.007197274	0	39434.50576	3172267.464
Jul-99	45.2856827	7324.138554	57.80871549	5068.518368	12.47418402	4145.822223	7.142264778	1300.552693	4.090923862	654.4944093	28.93250072	8191.224022	45.58486028	3819.34113	4.911887437	288.2100764	0.054899932	23.15424843	48.66588232	7649.824119	1.376284498	846.7593358	0	56.25411035	0.060849678	0.2835595	0.089043362	0.256751836	0.007454086	0	39625.31903	3211892.783
Aug-99	39.45932601	7363.59788	45.54446285	5114.062831	9.151960621	4154.974183	5.837309625	1306.390003	3.967635653	658.4620449	28.75586763	8219.979889	45.44862461	3864.789755	0	288.2100764	0.039805831	23.19405426	52.738078	7702.562197	0.63300568	847.3923415	0.160368345	56.4144787	0.05746914	0.212973874	0.044116017	0.189411526	0.007352669	0	39832.2775	3251725.06
Sep-99	41.45629686	7405.054177	41.84494964	5155.907781	7.000297463	4161.974481	4.428776978	1310.81878	3.87784203	662.339887	27.45187429	8247.431764	41.86163423	3906.651389	0	288.2100764	0.038031049	23.23208531	48.58552367	7751.147721	0.38937251	847.781714	0.158648633	56.57312733	0.053652404	0.158928891	0.091078228	0.246179477	0.007131844	0	40034.7732	3291759.834
Oct-99	53.95211359	7459.00629	55.35630443	5211.264085	10.25959379	4172.234074	8.269640288	1319.08842	4.867636198	667.2075232	31.09469262	8278.526456	51.56097478	3958.212364	0	288.2100764	0.037077751	23.30282306	60.81418251	7811.961904	0.634594532	848.4163085	0.250497842	56.82362517	0.062218796	0.222236547	0.171798925	0.282139674	0.007352669	0	40372.13067	3332131.964
Nov-99	31.38011359	7490.386404	38.21016282	5249.474248	8.11258705	4180.346662	6.441461871	1325.529882	3.496304733	670.7038279	23.72581295	8302.252269	47.40209557	4005.61446	0	288.2100764	0.037077751	23.30282306	60.81418251	7811.961904	0.634594532	848.4163085	0.250497842	56.82362517	0.062218796	0.222236547	0.171798925	0.282139674	0.007352669	0	40372.13067	3332131.964
Dec-99	65.142961	7555.529365	52.73638773	5302.210636	10.63517153	4190.981833	8.707588944	1334.237474	4.932610133	675.636438	33.08059847	8335.332859	47.32320036	4052.937666	0	288.2100764	0.058846482	23.41248553	62.80903779	7920.107223	0.692587656	849.5634279	0.134139735	57.03873424	0.069470049	0.248114563	0.070737751	0.298687406	0.007383378	0	40872.17566	3413508.401
Jan-00	15.17861416	7570.707095	56.25214691	5358.462783	9.901594985	4200.883428	12.59165771	1346.829129	4.712636546	680.2490766	32.62736684	8367.755596	48.06262537	4101.000285	6.593400682	294.8034771	0.071498372	23.48398839	96.548156	8016.655379	0.099287117	849.6950696	0.135574094	57.20230864	0.034650511	0.075495646	0.071498372	0.145363112	0.007437183	0	41172.72028	3454655.129
Feb-00	57.72431655	7628.432296	53.19003408	5411.652817	9.526573268	4210.410001	8.060946611	1354.890075	4.840079364	685.1891559	31.0758652	8398.831461	53.48926619	4154.489552	6.748905415	301.5523825	0.070227944	23.55421184	67.40966604	8084.065045	0	849.6950596	0.067610754	57.26991939	0.056335025	0.245797804	0.042136766	0.144425293	0.006717456	0	41452.73088	3496111.852
Mar-00	60.17357062	7688.605866	50.53903824	5462.191855	8.454724725	4218.864726	11.99583794	1366.885913	4.25136418	689.4405201	34.16878455	8433.000425	62.56023022	4217.049782	5.955155168	307.5075377	0.054426657	23.6086385	50.36832109	8134.433366	0.304248391	849.999308	0.070602098	57.34598149	0.041580613	0.153814464	0.04665142	0.225312836	0.014874366	0	41738.31774	3537850.17
Apr-00	71.17122302	7759.777089	58.06891329	5520.260768	7.959530481	4226.824256	8.226156759	1375.11207	4.106371829	693.5468919	32.92425596	8465.924501	57.53238925	4274.582171	7.508065127	315.0156028	0.046127982	23.65476648	81.1329042	8215.56627	0.583960621	850.5832686	0.297705415	57.64368691	0.053652404	0.229004165	0.161447936	0.569729648	0.007197274	0	42109.06998	3579959.24
May-00	45.02876183	7804.805851	52.87025702	5573.131026	8.650795911	4235.475052	9.930329421	1385.042399	4.657028701	698.2039206	28.9644468	8494.888948	33.39633169	4307.978503	3.465727225	318.48133	0.062201893	23.71696837	66.33967134	8281.905942	0.377268005	850.9605366	0.10141613	57.74510304	0.069301022	0.224805755	0.085527603	0.232580992	0.007437183	0	42286.79947	3622246.039
Jun-00	54.47027641	7859.276127	0	5573.131026	7.862694434	4243.337747	9.609996214	1394.652396	4.593169254	702.7970899	29.34524801	8524.234196	59.60978417	4367.588287	3.243026126	321.7243562	0.082768648	23.79973702	68.37410072	8350.280042	0.494648997	851.4551856	0.088166604	57.83326964	0.046945854	0.180586142	0.060195381	0.196943582	0.007197274	0	42508.37521	3664754.414
Jul-00	57.60436198	7916.880489	0	5573.131026	10.83360909	4254.171356	7.864820901	1402.517217	4.275704051	707.0727939	32.65599394	8556.89019	63.13830216	4430.726589	2.697669065	324.4220252	0.079442635	23.87917966	61.49198031	8411.772023	0.797806891	852.2529925	0.057976221	57.89124586	0.069301022	0.165646346	0.033129269	0.392480424	0.007437183	0	42753.77279	3707508.187
Aug-00	43.60893601	7960.489425	0	5573.131026	8.949635441	4263.120991	10.00977206	1412.526989	4.81929451	711.8920885	21.19597122	8578.086161	82.40060583	4513.127195	3.94982022	328.3718455	0.097359485	23.97653914	43.52442257	8455.296445	0.547647103	852.8006396	0.080151458	57.97139732	0.06237092	0.198268535	0.059497463	0.10902234	0.007437183	0	42950.41095	3750458.598
Sep-00	32.78031049	7993.269736	0	5573.131026	8.01187429	4271.132866	9.578917077	1422.105906	4.404731541	716.29682	7.884286255	8585.970448	64.51701628	4577.644211	3.122635365	331.4944808	0.094218856	24.070758	45.39189701	8500.688342	0.477637259	853.2782769	0.081132904	58.05253022	0.082932223	0.313081409	0.088330178	0.12071791	0.006870125	0.310791367	43084.40278	3793543.001
Oct-00	29.6642181	8022.933954	0	5573.131026	9.850886785	4280.983752	9.330283983	1431.43619	4.949107156	721.2459271	13.72498296	8599.695431	65.5824309	4643.226642	3.343351761	334.8378326	0.097359485	24.16811748	44.62309731	8545.31144	0.552041802	853.8303187	0.074540856

Month	RWM-1	RWM-2	RWM-2 (cumulative)	RWM-3	RWM-4	RWM-5	RWM-6	RWM-7	RWM-8 PCE	RWM-8 PCE (cumulative)	RWM-9	RWM-9 (cumulative)	RWM-10	RWM-10 (cumulative)	RWM-11	RWM-11 (cumulative)	RWM-12	RWM-12 (cumulative)	RWM-13b	RWM-13c	RWM-14b	RWM-14c	RWM-15b	RWM-17b	all wells /mo.	all wells accum.
May-04	8.746127073	9030.726317	16.1857266	5803.858987	10.31063991	4808.949158	17.44864521	1903.063418	10.46614464	948.7232472	16.78234123	9411.364877	45.5309407	6527.027274	2.818557092	482.5340407	0.992103294	46.34336238	0	15840.33931	0.164699796	869.5045613	0.093150716	62.81429452	0.034143431	0.057131087	0.093505672	0.105033306	0	0.182954699	55865.19354	5943244.879
Jun-04	9.563213934	9040.289531	16.48829989	5820.347287	10.49624233	4819.4454	9.903285119	1912.966703	5.363735555	954.0869827	16.14430292	9427.50918	41.23399924	6568.261273	2.423780083	484.9578207	1.108772738	47.45213512	0	15840.33931	0.215689209	869.7202505	0.073755699	62.88805022	0.026433624	0.044295949	0.09048936	0.110903446	0	0.199626202	55961.75075	5999206.63
Jun-95	9.036177206	9049.325708	20.74407785	5841.091364	10.34444529	4829.789845	10.89361363	1923.860316	5.938928588	960.0259113	13.63641287	9441.145593	40.21521424	6608.476487	2.995697266	487.953518	1.138227035	48.59036215	0	15840.33931	0.233933207	869.9541838	0.092964786	62.981015						0.223030973	56079.02634	6055285.656
Jul-95	9.898214313	9059.223923	19.06149973	5860.152864	12.06344869	4841.853294	11.50413874	1935.364455	5.808980719	965.834892	15.52866884	9456.674262	32.34870307	6640.82519	2.6400478	490.5935658	1.281528027	49.87189018	0	15840.33931	0.209627141	870.1638109	0.115418099	63.0964331						0.217706626	56184.67187	6111470.328
Jul-04	9.036177206	9049.325708	20.74407785	5841.091364	10.34444529	4829.789845	10.89361363	1923.860316	5.938928588	960.0259113	13.63641287	9441.145593	40.21521424	6608.476487	2.995697266	487.953518	1.138227035	48.59036215	0	15840.33931	0.233933207	869.9541838	0.092964786	62.981015	0.027382355	0.057384627	0.102396486	0.137925937	0	0.223030973	56079.35143	6055285.981
Aug-04	9.898214313	9059.223923	19.06149973	5860.152864	12.06344869	4841.853294	11.50413874	1935.364455	5.808980719	965.834892	15.52866884	9456.674262	32.34870307	6640.82519	2.6400478	490.5935658	1.281528027	49.87189018	0	15840.33931	0.209627141	870.1638109	0.115418099	63.0964331	0.028261295	0.0572156	0.112876153	0.149419765	0	0.217706626	56185.01965	6111471.001
Sep-04	11.404571	9070.628494	13.77574555	5873.92861	11.64404392	4853.497338	9.93861719	1945.303072	5.970236729	971.8051287	14.55779477	9471.232057	37.30461492	6678.129805	2.214143128	492.8077089	1.047399621	50.9192898	0	15840.33931	0.182941613	870.3467525	0.110087209	63.20652031	0.026237334	0.044165089	0.098242787	0.117037486	0	0.190155244	56290.77012	6167761.771
Oct-04	7.341513669	9077.970007	15.05826702	5888.986877	10.78347571	4864.280814	8.252230519	1953.555303	5.132822476	976.9379512	0	9471.232057	30.39018856	6708.519994	0	492.8077089	1.241840515	52.16113032	0	15840.33931	0.241015434	870.5877679	0.110087209	63.31660752	0.03388989	0.057131087	0.101297811	0.106723574	0	0.22338593	56339.7694	6224101.54
Nov-04	7.086043165	9085.05405	11.72501325	5900.71189	9.186829231	4873.467643	16.16115108	1969.716454	9.167200303	986.1051515	13.24560091	9484.477658	28.26459371	6736.784587	2.9745351	495.782244	1.268028777	53.42915909	0	15840.33931	0.158928891	870.7466968	0.098537221	63.41514474	0.033205604	0.056187808	0.106944945	0.111754033	0	0.204042711	56459.88059	6280561.421
Dec-04	8.94321242	9093.999263	17.83656191	5918.548452	9.302428353	4882.770071	13.87288148	1983.589335	5.727408345	991.8325599	12.62461795	9497.120726	30.37615933	6767.160747	3.843705142	499.6259492	1.288491935	54.71765103	0	15840.33931	0.269766906	871.0164637	0.084682469	63.49982721	0.034396971	0.057638167	0.101737281	0.113332526	0	0.204792972	56568.88372	6337130.304
Jan-05	13.00729481	9107.006558	24.79928633	5943.347738	10.18725028	4892.957321	11.26361348	1994.852949	5.409671609	997.2422315	16.1829719	9513.285247	28.71496312	6795.87571	2.63960833	502.2655575	1.20502646	55.92267749	0	15840.33931	0.174435744	871.1908995	0.065429761	63.56525697	0.034058917	0.057046573	0.093100008	0.067999515	0	0.253134661	56692.00635	6393822.311
Feb-05	10.05771026	9117.064268	20.75075441	5964.098493	8.277187611	4901.234509	13.57536691	2008.428316	5.320316365	1002.562548	16.21578493	9529.501032	28.3339922	6824.209632	2.298850678	504.5644082	1.102059644	57.02473713	0	15840.33931	0.245034457	871.4359339	0.067745975	63.63300295	0.030762893	0.051907611	0.118608891	0.081891889	0	0.249538205	56790.87364	6450613.184
Mar-05	10.35424885	9127.418517	22.62019175	5986.718684	8.203719803	4909.438229	11.55383264	2019.982148	6.307086043	1008.869634	14.66477243	9544.165805	37.72139159	6861.931023	2.39326855	506.9576767	1.262630822	58.28736795	0	15840.33931	0.257596971	871.6935309	0.067745975	63.70074892	0.034227944	0.068253056	0.123592457	0.09066602	0	0.266656812	56915.49256	6507528.677
Apr-05	8.060946611	9135.479463	17.80958849	6004.528273	7.443780386	4916.882009	12.76616433	2032.748313	5.862997349	1014.732631	12.1650284	9556.330833	31.30159788	6893.232621	2.16408936	509.1217661	0.986680803	59.27404876	0	15840.33931	0.150161303	871.8436922	0.08413613	63.78488505	0.026171905	0.044295949	0.082408785	0.08774131	0	0.125625142	56997.45926	6564526.136
May-05	7.886118289	9143.365582	13.6592315	6018.187504	7.467354184	4924.349363	14.51264824	2047.260961	6.307407194	1021.040038	12.81392806	9569.144761	38.14936766	6931.381989	2.70172571	511.8234918	1.006386066	60.28043482	0	15840.33931	0.187417009	872.0311092	0.092964786	63.83784984	0.013555956	0.046110534	0.092897175	0.089854691	0	0.147864718	57108.25723	6621634.394
Jun-05	11.18848921	9154.554071	19.15783415	6037.345339	8.90891632	4933.25828	9.323741007	2056.584702	5.053328285	1028.093367	13.21681181	9582.361573	34.59107914	6965.973068	2.629294964	514.4527868	1.259686482	61.5401213	0	15840.33931	0.191447482	872.2225567	0.08978599	63.96763583	0.019678001	0.03317289	0.0973922	0.091078228	0	0.133214994	57218.67776	6678853.071
Jul-05	14.37810284	9168.932174	19.34614101	6056.69148	9.199051511	4942.457331	12.60517986	2069.189882	7.068298614	1035.161665	13.55494192	9595.916515	50.70755805	7016.680626	2.77667223	517.229459	1.255024612	62.79514592	0	15840.33931	0.259033699	872.4815904	0.118792094	64.08642792	0.033974404	0.05966649	0.134477789	0.091190004	0	0.201141992	57373.75086	6736226.822
Aug-05	11.03686392	9179.969038	20.05503976	6076.746519	8.845869837	4951.303201	12.39220598	2081.582088	6.986489602	1042.148155	13.92781522	9609.84433	42.31486619	7058.995492	2.81164392	520.0411029	1.16875329	63.96389921	0	15840.33931	0.217233351	872.6988238	0.122435441	64.20886336	0.027314744	0.057772681	0.124133343	0.104458614	0	0.208308732	57482.24198	6793709.064
Sep-05	10.62399394	9190.593031	15.75221507	6092.498734	8.142161303	4959.445362	9.769317683	2091.351406	5.215013707	1047.363169	11.58401212	9621.428342	45.95819159	7104.953684	2.945451571	522.9865545	1.060207497	65.0241067	0	15840.33931	0.21056933	872.9093931	0.101821795	64.31068516	0.032513306	0.044034229	0.120390761	0.083128512	0	0.222951912	57585.06979	6851294.134
Oct-05	17.80994017	9208.402972	13.33182643	6105.830561	8.67719791	4968.12256	8.57270549	2099.924111	6.986303673	1054.349472	14.55118637	9635.979529	46.1967376	7151.150421	2.570898902	525.5574534	1.186213768	66.21032047	0	15840.33931	0.219008133	873.1284012	0.092406997	64.40309215	0.026976691	0.045434426	0.100638607	0.074540856	0	0.231363998	57714.07159	6909008.205
Nov-05	24.96145399	9233.364426	20.12521318	6125.955774	8.200606437	4976.323167	7.802499053	2107.72661	0	1054.349472	10.66635971	9646.645888	38.30029231	7189.450714	2.659261795	528.2167152	1.052601287	67.26292176	0	15840.33931	0.192379856	873.3207811	0.089426126	64.49251828	0.026171905	0.055042787	0.082228853	0.065069898	0	0.211109125	57821.93802	6966830.144
Dec-05	20.58747444	9253.9519	18.24476183	6144.200536	10.61657857	4986.939745	11.50532192	2119.231932	0	1054.349472	14.7651744	9661.411063	45.19035153	7234.641065	2.508358955	530.7250741	1.029069474	68.29199123	0	15840.33931	0.224974782	873.5457559	0.075605725	64.56812401	0.027111912	0.05696206	0.092694343	0.07487891	0	0.218146096	57957.41344	7024787.557
Jan-06	11.39105975	9265.34296	18.01826581	6162.218802	8.686291556	4995.626037	11.29674275	2130.528675	7.258859523	1061.608332	11.20174964	9672.612812	35.63492374	7270.275989	2.995240894	533.720315	0.981877168	69.2738684	0	15840.33931	0.175551321	873.7213072	0.097752064	64.66587607	0.034312457	0.046380977	0.062337115	0.113332526	0	0.185828156	58048.11479	7082835.672
Feb-06	16.46631549	9281.809275	18.03728406	6180.256086	8.370697645	5003.996735	13.21491435	2143.743589	10.25862325	1071.866955	13.19521999	9685.808032	35.39488376	7305.670873	2.757454419	536.4777694	1.422115865	70.69598427	0	15840.33931	0.24411844	873.9654256	0.084006361	64.74988243	0.030839228	0.041098614	0.119127967	0	0	0.172211132	58179.18883	7141014.861
Mar-06	21.63206058	9303.441336	16.37295812	6196.629044	11.95865203	5015.955387	12.13021431	2155.873803	3.553283115	1075.420238	15.19044604	9700.998478	58.86361227	7364.534485	1.020009633	537.4977791	1.234944218	71.93092848	0	15840.33931	0.228693374	874.194119	0	64.74988243	0.033888989	0.11392412	0.12138629	0	0.006507535	0.198606588	58344.22646	7199359.087
Apr-06	44.71878834	9348.160124	28.46194623	6225.09099	9.16932677	5025.124713	10.44798788	2166.321791	8.410014388	1083.830253	13.68381674	9714.682295	39.72731541	7404.2618	2.505632715	540.0034118	1.125326467	73.05625495	0	15840.33931	0.14672624	874.3408452	0	64.74988243	0.019678001	0.033123817	0.135145172	0	0	0.149490647	58518.69599	7257877.783
May-06	104.0968966	9452.257021	23.60561848	6248.696609	8.430367952	5033.555081	11.03103249	2177.352824	8.442892844	1092.273145	13.08944188	9727.771737	24.69009496	7428.951895	2.640368951	542.6437807	1.174703037	74.23095799	0	15840.33931	0.203508368	874.5443536	0.303031397	65.05291383	0.027449966	0	0.109326588	0	0	0.130353533	58755.64472	7316633.428
Jun-06	79.52333207	9531.780353	24.38861643	6273.085225	8.00560939	5041.560691	10.18610526	2187.538929	7.203555017	1099.4767	10.65196516	9738.423702	25.76247785	7454.714373	2.455971526	545.0997523	1.128859674	75.35981766	0	15840.33931	0.195962136	874.7403157	0	65.05291383	0.026237334	0.044165089	0.127915184	0	0	0.155395683	58897.02825	7375530.456
Jul-06	63.70961303	9595.489966	23.10665112	6296.191876	6.564006906	5048.124698	7.607866232	2195.146795	8.709617266	1108.186318	10.05642348	9748.480126	27.45165619	7482.166029	2.416915411	547.5166677	0.888675744	76.24849341	0	15840.33931	0.154659599	874.8949753	0.420031806	65.47294563	0.020333934	0.034227944	0.086085392	0.081623082	0	0.132517077	59029.69911	7434560.155
Aug-06	57.49787505	9652.987841	25.42400969	6321.615886	7.054911685	5055.179609	9.293267096	2204.440062	10.59612632	1118.782444	9.831279667	9758.311405	30.95304809	7513.119078	2.537837243	550.0545049	0.986778947	77.23527235	0	15840.33931	0.174993533	875.0699689	0.081296479	65.55424211	0.020333934	0.038893086	0.100418872	0.074033775	0	0.137351246	59187.49208	7493747.647
Sep-06	81.1329042	9734.120745	20.43862173	6342.054508	6.215205755	5061.394815	8.872766376	2213.312829	11.18897993	1129.971424	9.534751988	9767.846157	27.94128891	7541.060366	2.311568042	552.366073	1.16096933	78.39624168	0	15840.33931	0.207477774	875.2774466	0	65.55424211	0.032878455	0.063303294	0.127080954	0	0	0.162821961	59371.08478	7553118.732
Oct-06	157.7020825	9891.822828	22.28467338	6364.339181	7.861744612	5069.25656	8.516926619	2221.829755	8.660937524	1138.632362	11.59051147	9779.436669	27.66953184	7568.729898	2.275777963	554.6418509	0.877401651	79.27364333	0	15840.33931	0.214393699	875.4918403	0.050302401	65.60454451	0.021719523	0.034227944	0.092897175	0.373549413	0	0.171089012	59697.80167	7612816.534
Nov-06	50.18462704	9942.007455	26.53994699	6390.879128	6.923646498	5076.180206	8.728493752	2230.558249	9.295279061	1147.927641	9.825260129	9789.261929	27.82040742	7596.550306	2.070655661	556.7125066	0.860106929	80.13375026	0	15840.33931	0.195962136	875.6878025	0	65.60454451	0.027218781	0.033123817	0.104654903	0.072136312	0	0.147315108	59734.67166	7672551.205
Dec-06	53.33812344	9995.345578	32.71025157	6423.589379	8.431010254	5084.611216	11.50532192	2242.063571	10.28951155	1158.217152	13.48834532	9802.750274	42.91203817	7639.462344	2.299458629	559.0119652	0.843106096	80.97685636	0	15840.33931	0.21332883	875.9011313	0	65.60454451	0.026165362	0.034227944	0.093505672	0	0	0.176633094	59944.23435	7732495.44
Jan-07	73.71262401	10069.0582	26.19916698	6449.788546	7.080130496	5091.691347	9.284984778	2251.348556	10.04256327	1168.259715	196.2427474	9998.993022	34.08765165	7673.549996	2.534034139	561.5459993	0.848396638	81.825253	0	15840.33931	0.245427035	876.1465583	0	65.60454451	0.021719523	0.045637259	0.101517546	0	0	0.176633094	60488.77975	7792984.219
Feb-07	72.8782855	10141.93649	23.22697645	6473.015523	7.957742067	5099.649089	8.608724574	2259.95728	11.02639788	1179.286113	163.9059144	10162.89894	28.03194184	7701.581937	2.073128906	563.6191283	0.791820068	82.61707307	0	15840.33931	0.203874775	876.3504331	0.067069867	65.67161438	0.02418284	0.030915562	0.091097857	0.067479894	0	0.15228777	60766.06077	7853750.28
Mar-07	89.40507989	10231.34157	26.76777342	6499.783296	8.754240363	5108.403329	10.85744188	2270.814722	8.972454407	1188.258567	173.5642419	10336.46318	34.08765165	7735.669589	2.399911306	566.0190396	0.957402075	83.57447514	0	15840.33931	0.236755956	876.5871891	0.075757849	65.74737223	0.023122878	0.045569648	0.092897175	0.081809012	0	0.16824936	61159.492	7914909.772
Apr-07	89.08752745	10320.4291	26.20592806	6525.989224	9.650579023	5118.053908	9.984581598	2280.799304	11.12960242	1199.38817	205.1018554	10541.56503	29.6360833	7765.305672	2.586896479	568.605936	1.006767739	84.58124288	728.5424006	16568.88171	0.232337811	876.8195269	0.098441257	65.84581349	0.022896818	0.042225424	0.105341916	0.081342279	0	0.178440045	63029.95789	7977939.73
May-07	53.09079558	10373.62889	23.0040518	8.381278337	5126.436087	11.1056875	291.9052801	2291.904284	11.72825955	1211.111559	194.0026342	10735.56767	42.03363351	7807.339616	2.150322028	571.0491566	1.035103873	85.61634661	760.7923702	17329.67408	0.240313972	877.0220316	0.094647023	65.94227051	0.021724546	0.098960017	0.076819338	0.164843468	64132.70526	8042072.435
Jun-07	138.4444618	10511.97336	23.07004317	6572.063319	8.696440454	5135.132487	11.20648239	2303.112374	11.09557995	1222.206608	131.4451193	10867.01279	55.15630746	7862.495923	2.565370087	573.6745267	0.979777963	86.59612458	0	17329.67408	0.238295191	877.298136	0.133322953	66.07560346	0.027087921	0.039242154	0.117125816	0.078810148	0	0.164101113	63790.77286	8105863.208
Jul-07	88.87433548	10600.84769	26.77791503	6598.841234	9.298321	5144.430808	11.23183643	2314.34421	11.87785718	1234.084465	0	10867.01279	52.00365619	7914.499579	2.650882423	576.3254091	1.012437228	87.6085618	795.3289572	18125.00304	0.239916759	877.5380528	0.093781186	66.16938465	0.025354033	0.040496813	0.106106626	0.087295624	0	0.170368957	65406.52475	8171269.733
Aug-07	136.0666414	10736.91434	26.15420583	6624.99544	9.343096221	5153.773904	12.56123287	2326.905443	12.24954729	1246.334013	0	10867.01279	54.63084105	7969.130421	2.7966005	579.1220096	1.061962105	88.67052391	0	18125.00304	0.226462219	877.764515	0.076299281	66.24568393	0.024339871	0.038330734	0.101608821	0.091173101	0	0.156535797	64917.45099	8236187.184
Sep-07	89.5128209	10826.42716	21.44754866	6646.442989	8.965921999	5162.739826	11.98346081	2338.888904	9.858629307	1256.192642	0	10867.01279	53.13158349	8022.262004	2.380400151	581.5024097	1.069694813	89.74021872	0	18125.00304	0.243259674	878.0077747	0.078261645	66.32394557	0.022251353	0	0.104936251	0.101353972	0	0.146379462	65059.5902	8301246.774
Oct-07	96.38589019	10922.81305	23.14907686	6669.592066	10.37487012	5173.114696	10.98235275	2349.871257	0	1256.192642	0	10867.01279	46.44723544	8068.709239	2.453340704	583.9557504	1.026838319	90.76705704	138.7626202	18263.76566	0.242134392	878.2499091	0.083822122	66.4077677	0.0260893	0	0.13511502	0.093826823	0	0.17680212	65520.79189	8366767.566
Nov-07	129.0111321	11051.82418	20.17853843	6689.770604	9.497080803	5182.611777	10.53190155	2360.403158	0	1256.192642	561.3808103	11428.3936	40.76535858	8109.474598	2.843332071	586.7990825	0.943219084	91.71027612	557.0493601	18820.81502	0.228834048	878.4787431	0.087687331	66.49545503	0.023972281	0.032807137	0.127023703	0.084208103	0	0.172577539	67855.92698	8434623.493
Dec-07	151.3889284	11203.21311	18.78733813	6708.557942	0	5182.611777	12.19157107	2372.594729	10.84983567	1267.042478	333.253404	11761.647	35.17922726	8144.653825	2.767578584	589.5666611	1.077242136	92.78751826	0	18820.81502	0.246238364	878.7249815	0.092572644	66.58802767	0.113636774	0.192437107	0.231186847	0.090527418	0	0.204028971	67655.45082	8502278.944
Jan-08	134.7989398	11338.01205	24.08633094	6732.644273	0	5182.611777	12.09387353	2384.688603	11.5208724	1278.56335	13.08944188	11774.73644	50.40719727	8195.061023	2.676371677	592.2430328	1.102900417	93.89041868	23.50825899	18844.32328	0.2332571	878.9582386	0	66.58802767	0.027856588	0.037114936	0.115758037	0.073394445	0.014134991	0.170379099	67636.2766	8569915.22
Feb-08	96.02907989	11434.04113	20.95846119	6753.602734	0	5182.611777	9.135739493	2393.824342	11.50516925	1290.068519	9.531207876	11780.66765	24.2744415	8219.335464	2.475077016	594.7181098	0.968687618	94.85910629	18.36918743	18862.69247	0.234194926	879.1924335	0	66.58802767	0.020194438	0.033771358	0.099994661	0.338738647	0.012687853	0.150684741	67742.73908	8637657.959
Mar-08	102.8190534	11536.86018	19.79642863	6773.399163	7.894231579	5190.506009	9.817081409	2403.641424	11.6780674	1301.746587	8.234989777	11788.90264	42.64210223	8261.977566	2.903712836	597.6218226	1.130451799	95.98955809	39.26832563	18901.96079	0.25928724	879.4517208	0	66.58802767	0.021383143	0.03714291	0.077764612	0.373425805	0.01477341	0.154152518	68045.76787	8705703.727
Apr-08	105.4400606	11642.30024	16.72548277	6790.124646	7.089968951	5197.595978	8.35210905	2411.993533	12.0129042	1313.759491	8.024960242	11796.9276	36.068156	8298.045722	2.253400984	599.8752236	0.971631958	96.96119005	40.89360091	18942.85439	0.215918213	879.667639	0	66.58802767	0.020441632	0.026982847	0.120380098	0.360056608	0.013324794	0.119082166	68275.40215	8773979.129
May-08	105.607997	11747.90824	14.84732147	6804.971967	6.597457327	5204.193435	9.019274517	2421.012807	10.62841045	1324.387901	5.912560394	11802.84016	34.48993563	8332.535658	2.647299053	602.5225227	0.97359485	97.9347849	36.25626657	18979.11066	0.223115487	879.8907545	0	66.58802767	0.021173039	0.018657036	0.10227913	0.370579231	0.014176828	0.127108217	68491.75412	8842470.883
Jun-08	111.0179477	11858.92619	20.45334343	6825.425311	8.382043165	5212.575478	12.18956456	2433.202372	11.30626278	1335.694164	7.845028398	11810.68519	50.10938281	8382.645041	2.494836804	605.0173595	0.942842863	98.87762776	51.52593715	19030.6366	0.225732677	880.1164871	0	66.58802767	0.020388431	0.026806503	0.114059708	0.355826276	0.013348017	0.115319955	68817.52851	8911288.412
Jul-08	194.7189701	12053.64516	14.34531162	6839.770622	8.471627414	5221.047106	12.82914048	2446.031512	13.06239758	1348.756562	7.214067399	11817.89926	7.700864824	8390.345906	2.529487315	607.5468468	0.892461946	99.77008971	25.18500568	19055.8216	0.212973874	880.329461	0	66.58802767	0.021291549	0.027655105	0.109110851	0.369343457	0.013785971	0.129812647	69115.38546	8980403.797
Aug-08	81.30193109	12134.94709	16.44462552	6856.215248	8.518954941	5229.566061	9.719045816	2455.750558	11.92653692	1360.683099	6.92165089	11824.82091	36.02808027	8426.373986	2.564137827	610.1109846	0.922210678	100.6923004	34.05891708	19089.88052	0.2332571	880.5627181	0	66.58802767	0.021127232	0.027630531	0.120433917	0.362828885	0.014283954	0.131840969	69245.50899	9049649.306
Sep-08	130.8758803	12265.82297	16.09572132	6872.310969	6.696081787	5236.262142	10.45894737	2466.209505	12.24845134	1372.93155	7.007527452	11831.82844	33.26285498	8459.636841	2.27106702	612.3820516	0.906856494	101.5991569	37.45853843	19127.33906	0.212319576	880.7750377	0	66.58802767	0.020217796	0.028194098	0.115092394	0.361071404	0.011991267	0.127915184	69551.84447	9119201.151
Oct-08	137.824521	12403.64749	14.27939114	6886.59036	6.75837092	5243.020513	8.786017418	2474.995523	10.46614464	1383.397695	6.992642181	11838.82108	36.02808027	8495.664921	2.45224203	614.8342937	0.818090117	102.417247	30.29806891	19157.63713	0.20232518	880.9773629	0	66.58802767	0.013736558	0.018473693	0.109522615	0.367559627	0.014380952	0.121699356	69804.1429	9189005.294
Nov-08	106.3887921	12510.03628	14.14264294	6900.733003	7.608172662	5250.628686	8.427353275	2483.422876	11.85587278	1395.253567	6.664021204	11845.4851	39.6749716	8535.339893	2.924056039	617.7583497	0.89965922	103.3169062	40.2801969	19197.91733	0.194326392	881.1716893	0	66.58802767	0.028544231	0.027608984	0.120362167	0.381407989	0.014201059	0.130695949	70027.41459	9259032.708
Dec-08	113.0789852	12623.11527	13.71146081	6914.444464	7.515611359	5258.144297	7.50310337	2490.92598	12.08880273	1407.34237	6.35372056	11851.83882	33.83918213	8569.179075	3.130715941	620.8890656	0.989145324	104.3060515	37.52396819	19235.44129	0.243398713	881.415088	0	66.58802767	0.021386212	0.027740503	0.120761789	0.410705992	0.014235307	0.127108217	70260.32983	9329293.038
Jan-09	117.1710214	12740.28629	13.91429307	6928.358757	8.844500719	5266.988798	8.708265051	2499.634245	12.90013177	1420.242502	7.214067399	11859.05289	33.77157137	8602.950646	3.073922908	623.9629885	0.899899129	105.2059507	39.21423703	19274.65553	0.227172132	881.6422601	0.314062855	66.90209053	0.018528727	0.026309034	0.118369527	0.329602423	0.014198258	0.138737266	70516.78183	9399809.82
Feb-09	104.5538153	12844.8401	13.19063991	6941.549397	6.420666111	5273.409464	7.303706172	2506.937951	10.33266793	1430.57517	6.784630064	11865.83752	31.61173495	8634.562381	2.466222189	626.4292107	0.772507384	105.9784581	29.31253313	19303.96806	0.200225975	881.8424861	0.324531617	67.22662214	0.017312715	0.067174555	0.081082741	0.305338887	0.012824233	0.112654782	70697.02709	9470506.847
Mar-09	113.4589	12958.299	11.88597047	6953.435368	7.714386975	5281.123851	7.682271867	2514.620223	11.43973949	1442.014909	6.172861795	11872.01038	29.15375691	8663.716138	2.860949034	629.2901598	0.766029837	106.7444879	40.52419538	19344.49226	0.21446131	882.0569474	0.324531617	67.55115376	0.019333295	0.024231694	0.110425263	0.380310488	0.014536312	0.116020053	70948.21779	9541455.065
Apr-09	150.974595	13109.2736	9.274668686	6962.710036	8.204892086	5289.328743	9.781749337	2524.401972	13.34767134	1455.362581	7.557137448	11879.56752	28.58217342	8692.298311	0	629.2901598	0.640557365	107.3850453	36.39530481	19380.88756	0.157031427	882.2139788

Missing Data Sources

Source #	Document Tile	Filename
1	M-Area Hazardous Waste Management Facility Post-Closure Care Permit GW Monitoring and Corrective Action Program	1990_WSRC_RP_90_00067_004
2	M-Area Hazardous Waste Management Facility Groundwater Monitoring Report	1992_WSRC_RP_92_00067_004
3	M-Area Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report (Fourth Quarter)	1994_WSRC_RP_94_00067_004
4	M-Area Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report	1995_WSRC_TR_95_0138_4
5	M-Area and Metallurgical Laboratory Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report	1996_WSRC_TR_96_00138_004
6	M-Area and Metallurgical Laboratory Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report	1997_WSRC_TR_98_00002
7	M-Area and Metallurgical Laboratory Hazardous Waste Management Facility Groundwater Monitoring and Corrective-Action Report (Third and Fourth Quarters)	1999_WSRC_TR_2000_00028
8	Annual 2010 M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Groundwater Monitoring and Corrective	2010 _SRNS-RP-2011-00253
9	Annual 2011 M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Groundwater Monitoring and Corrective	2011 _SRNS-RP-2012-00137