CEWG WATER DOSSIER

April 25, 2007

Prepared by Stephen Littlejohn, Facilitator

I prepared this dossier for the Community Environmental Working Group to summarize information gathered from interviews and other sources as part of the Group's water-research effort. It includes (1) a variety of documents and websites containing information relevant to water issues; (2) a summary of a panel discussion by water experts held at the regular CEWG meeting on April 18, 2007; (3) a presentation by Frank Robinson delivered to the Community Advisory Panel on December 15, 2005; (4) the executive summary of the 2000 water report presented to MRGCOG, and (5) the most recent Intel water summaries.

WATER DATA, WATER USE, AND AQUIFER IMPACTS

The following sites provide water data:

USGS water data at http://waterdata.usgs.gov/nm/nwis (ref. Jess Ward, District 1 Supervisor, Water Rights Division, OSE)

OSE "Waters" database at www.ose.state.nm.us (ref. Jess Ward, District 2 Supervisor, Water rights Division, OSE)

Report: "Water Use by Categories in New Mexico Counties and River Basins, and Irrigated Acreage in 2000" (ref. Cheri Vogel, State Conservation, OSE)

1994 Intel Order of the OSE (See appendix)

2004 Water Allocation from OSE (See appendix)

2006 Water Allocation from OSE (See appendix)

Report: "Historical and Current Water Use in the Middle Rio Grande Region," prepared for the Middle Rio Grande Council of Governments, June, 2000 (See appendix)

Book by Barbara Rockwell, *Boiling Frogs*. See especially p. 95.

RETURN FLOW CREDIT

The general procedure for quantifying withdrawals and depletions is outlined on p. 55 of "Water Use by Category" (2003). At Intel the methodology is as follows: "Intel meters all water coming into the site. This includes both utility system water entering the site and the Intel well production water. Intel also meters the sanitary sewer effluent leaving the site that is in proportion to the amount of Intel

well water production divided by the total amount of after brought on to the Site." (Intel Annual Report, 2006—See Appendix)

WATER PLANS

For relevant water planning documents, see:

http://www.waterassembly.org/archives/MRG-Plan/C-Summaries/Rio%20Grande%20General%20Summary.pdf

http://nmh2o.sandia.gov/ExTrainSD/SDWelcome.asp

http://www.ose.state.nm.us/PDF/Publications/StateWaterPlans/swp-2006-06-progress-report.pdf

WASTEWATER RESOURCES

For wastewater information, see NMED website at

www.nmenv.state.nm.us/fod/liquidWaste (ref. Dennis McQuillan, Environmental Health Division, NMED

PANEL DISCUSSION HELD APRIL 18, 2007

Panelists:

- George Schuman, NMED's Water Quality Department
- John Hawley, a hydrogeology consultant
- Larry Webb, Director of Rio Rancho Utilities

George Schuman started the session with a discussion on gray water.

- In 2003 the water quality act was amended to allow for the use of gray water without a permit. The legislature put very specific requirements into the act that any daily discharge of gray water of less than 250 gallons does not require a permit. However, the discharge must meet certain requirements. If someone wanted to discharge more than 250 gallons per day, they must submit information to the department (the same information that would be required to obtain a permit.
- Which regulations apply depend upon whether you have a liquid waste disposal permit or a ground water discharge permit, or no permit at all if the property is served by a city sewer. There are two different sets of regulations that deal with domestic waste from a residence and the differences are based on daily discharge volume. Liquid waste disposal and treatment regulations apply to homes not served by city sewers and the design flow is less than 2000 gallons per day. In cases where the discharge is greater than 2000 gallons, the water quality control regulations apply, which are the regulations that Mr. Schuman works with.
- The requirements are basically the same, because state statues specify what must be done, but the liquid waste disposal and treatment regulations apply additional requirements on top of what the statute requires. That was

done to comply with other liquid waste disposal requirements within their regulations.

- Mr. Schuman gave a definition of gray water. Any domestic waste water generated in a residence, excluding toilets, kitchen sinks, dishwashers, or washing machines that have come in contact with diapers. Anything that might have picked up pathogens is excluded from the gray water stream.
- Lane Kirkpatrick asked how much waste is being discharged and how does the state monitor the quantity. Mr. Schuman said it couldn't be monitored. Studies have shown that septic systems can contaminate the ground water. Mr. Kirkpatrick responded that such contamination was not caused by gray water. Mr. Schuman agreed.
- Mr. Pineda asked what were requirements of gray water use. Mr. Schuman responded:
    - The first requirement is to have a facility that segregates gray water from the black water and must have an overflow into the septic or city sewer system.
    - Any storage tanks that collect gray water must restrict access and prohibit the growth of mosquitoes.
    - The system must be sited outside of a flood plain.
    - Gray water may only be applied where the depth to ground water is greater than five feet.
    - Gray water piping must be identified as carrying gray water.
    - Gray water must be used on the site and not be allowed to run off the property.
    - Ponding of gray water is not allowed, nor is it allowed to be sprayed or be discharged into a watercourse.
    - These are the requirements that were contained in the changes to the water quality act.
    - Gray water cannot be stored for more than 24 hours before it is discharged.
    - Gray water may only be used for irrigation or composting.
    - It may not be used for food plants except for fruit and nut trees.
    - It must be discharged to a mulched surface area or an underground distribution system.
    - It may not be discharged within 100 feet of a water-course or 200 feet of a public water supply line.
- Mr. Kirkpatrick asked whether Mr. Schuman was in a position to give a perspective on what has happened to water quality in the past five years. Mr. Schuman responded in the negative. The Water Quality Bureau has never been given the budget for regional surveillance of quality. Mr. Kirkpatrick then asked whether the Bureau was primarily responsible for city system water quality. Again, Mr. Schuman responded in the negative. The Water Quality Bureau is responsible for enforcing the water quality control regulations, which contain three components: the reporting and cleaning up of spills, a discharge permitting program for anyone who discharges effluents, and an abatements program to clean up ground water

contamination. Mr. Kirkpatrick asked to what degree the Water Quality Bureau had control over the drilling of wells and the quality of that water. Mr. Schuman said they had little or no control. The regulations contain standards for water quality and it is assumed that if the standards are met, the water is safe to drink. If the water quality standards are not met, the Water Quality Bureau has no authority to prevent that well's use. The Bureau would warn people that the standards are exceeded, but it could not prohibit the drilling or use. If the standards were exceeded because of contamination, the Bureau could ask the Office of the State Engineer to prohibit drilling of new wells in the contamination plume. The OSE could do that through an order, but the OSE is reluctant to use those orders.

- Larry Webb stated that Rio Rancho was not considering implementing an ordinance on gray water because it wasn't economically feasible to use it for residential use. The only sources of gray water were showers or bathtubs and bathroom sinks. There was also no cost effective way to enforce any regulations.
- Mr. Webb also said that if the City knew ground water was contaminated, they would not allow the drilling of a well in that area.
- Mr. Schuman clarified that the enforcement limitations of the Water Quality Bureau did not restrict municipalities from prohibiting drilling in their jurisdictions.

John Hawley provided an overview of his activities in developing models of the Rio Grande basin starting in 1991. He ran an environmental and engineering geology program for the Office of the State Geologist through New Mexico Tech in Socorro. Albuquerque tasked his group to develop a model of the aquifer in 1992 that was used by the US Geological Survey to build a numerical model to assist with management of the aquifer. In 1992, the Bureau of Reclamation provided a contract to look at the whole Albuquerque basin, from Cochiti dam to San Acacia. The contract had them look at elements of geology that control ground-water recharge, flow, storage, and quality from a geologic point of view.

- There is a major rock formation called the Yeso Formation, which is Spanish for gypsum. Water that flows through that formation is high in calcium sulfate. That has an affect on the quality of the water.
- Everyone is concerned with arsenic and this aquifer system has teetered on the verge of EPA standards for the amount of arsenic. Especially since the standards were reduced from 50 parts per billion (ppb) to 10 ppb.
- Dr. Hawley has monitored deep wells (1500 feet or more) in the Albuquerque area since 1992 collecting baseline data. He pointed out that the Corrales aquifer is shallow (within 50 to 100 feet of surface near the river flood plane). There are several different aquifers in the Albuquerque basin and the geology is different in the different aquifers. Researching the aquifers is a science that uses many different techniques to understand the characteristics of each aquifer. Cuttings from the drilling, electrical properties, as well as radioactive properties help to characterize the different aquifers.

- Intel has shared all the information from their monitoring and production wells. Other corporations have laid their cards on the table as well. The only ones that didn't, were the people involved with the Superfund site west of the airport, due to litigation. As a general rule, everyone has shared their information. Mr. Webb added, however, that the Pueblos generally do not share data.
- All of the information resulted in a series of geologic maps that show the different aquifers (the maps were shown on the wall at the meeting). The maps show the Rio Grande river, the basalts of the Albuquerque volcanoes, the Santa Ana volcanic field, and the Sandia mountains on the east. Rio Rancho is right in the middle, with the Arroyos de las Montoyas to the north and Arroya de las Caldecias to the south. Corrales is right by the Rio Grande floodplain.
- There have been about 20 deep wells drilled for testing. The deepest, near Isleta Pueblo is 21 thousand feet. Several wells have been drilled between 15 and 20 thousand feet, through the complete basin fill. The data has provided a good three-dimensional geologic picture of the basin.
- The answer to question seven in the CEWG's list of questions, "Are certain features of the aquifer's hydrogeology particularly important in the answers given?" [to the rest of the CEWG's questions], is yes. The answers to almost all the questions have a hydrogeologic component.
- Focusing on the Intel area, new wells have been drilled into deep aquifers and those aquifers have been characterized by using carbon-14 radioactive dating methods. The water in those aquifers is 20 thousand years old. By contrast, the water in the Corrales aquifers is just days old. Intel is producing water from completely different and much deeper aquifer systems than the Corrales aquifer and most of the other city wells.
- Mr. Pineda asked for a layman's explanation of how many wells Intel has, how deep are each of the wells, how much water are they drawing from each well, and do they plan to drill more wells. How does this affect the level and quality of water in the aquifer? What effect are they having with their effluent or discharge water?
- Mr. Kirkpatrick asked whether Intel's pumping has brought down the water table around Corrales? Mr. Webb answered Mr. Kirkpatrick's question. The Corrales communities' aquifer is not connected to the same aquifer that Intel is using. The Corrales aquifer has dropped some 50 feet in the past few years, but the studies show that the drop is due to the increased population and the quadrupling of wells in Corrales. Any flow between the Corrales aquifer and the aquifers that Intel and Rio Rancho use would occur over a period of 400 to 1000 years, if at all.
- Mr. Kirkpatrick clarified that the Corrales aquifer and the aquifers used by Intel are separate and distinct.
- Mr. Webb pointed to the maps and discussed how the faulting separated the different aquifers. There was a 6 year, $36M USGS study to understand the geologic structure in the Albuquerque, basin. His question to the USGS was how much water is left. Their answer was "they don't know. The geologic

structure is fractured and the issue that complicated". According to Senator Domenici, this is the most studied river region in the United States. Complications include such things as saline content, mineral content, and the clay structure.

- Dr. Hawley explained how the faults separate the different aquifers. The region is highly stratified. This can be seen in the bluff near the high school; red and white beds can be seen, some with river gravel some without. If you go 200 – 300 north of the school down in the arroyo you will see those same beds offset by 30 feet.
- Mr. Bartlit asked whether Dr. Hawley was saying the faults joined aquifers together, or did they separate aquifers. Dr. Hawley responded that they tend to partition aquifers, however the faults are not totally impermeable. The levels in some aquifers are falling. There is a huge cone of depression under Albuquerque from the river in the west to Wyoming Blvd in the east; from Sandia Pueblo in the north to beyond Kirtland AFB in the south. This is caused by Albuquerque Municipal Water District pumping. Mr. Kirkpatrick asked whether that meant Albuquerque was pulling more out than they were putting back in, to which Dr. Hawley responded yes.
- Mr. Bartlit asked whether any of that was due to Intel. Dr. Hawley said no, not directly. Everyone pulling out of the aquifers in the Albuquerque basin contribute something to the problem. Mr. Bartlit asked what percentage did Intel contribute? Dr. Hawley responded, probably half of one percent or less.
- Mr. Webb pointed out that no one can tell, because to understand the percentages, it is necessary to have everyone's input. The Pueblos do not report how much they take out of the aquifer. That means it is impossible to calculate the number. Mr. Bartlit asked "if you leave the pueblos aside, and just consider the public, agriculture, and Intel, how do the numbers come out?" Mr. Webb responded that you can' leave the pueblos out of the equation. They are in the business of growing grass for soccer fields and golf courses and no one knows how much water they are taking out of the aquifer. Municipalities are probably taking the most, but with their agriculture and golf courses being more popular on the pueblos, no one can say for sure what roll the pueblos play in drawing down the aquifers.
- Mr. Littlejohn provided some numbers from the State Engineer's Office, "The Water Use by Categories, 2003" document. The numbers are broken down by county and the aquifers span county boundaries so it is difficult to correlate the numbers. Sandoval county showed industrial groundwater withdrawal is 3.82 percent of the total, industrial depletion of the aquifer is 4.5 percent, and 1.65 percent of total depletion. Since Intel is one of the biggest industries in Sandoval County, it probably influences the industrial fraction heavily. Intel also buys water from the city, which would not be represented in these numbers. Mr. Webb pointed out as well that those percentages are not accurate because no one knows how much water the Pueblos are removing from the aquifer. Mr. Littlejohn asked Larry Webb how much water Intel purchases from the City. Mr. Webb responded that

Intel used around 400 acre-feet of water per year, depending on their production rates. They were not the largest users. Rio Rancho itself was the largest user, followed by the Rio Rancho school system. Intel is number three.

- Dr. Hawley said that agricultural water use, such as a 2000-acre alfalfa field will use as much water as Intel in a year's time. Hugh Church asked about golf course's water use. Mr. Webb said he remembered the Rio Rancho golf course using around 200 acre-feet per year, but they were very conservative when compared to other golf courses in the area.
- The question was asked whether there was a cone of depression under Rio Rancho similar to that under Albuquerque. Mr. Webb said there was. It was a smaller cone of depression, but it was there. Mr. Kirkpatrick asked Mr. Webb to quantify it. Mr. Webb responded that the cone of depression did result in some subsidence, but it was on the order of a fraction of an inch per year and that it rebounded. This has been confirmed using satellite data. It is nothing like the subsidence seen in Phoenix, Houston or Las Vegas, NV, which is larger and consistent. Eventually, the subsidence will increase, but that we are in a critical management area. If the water level in any well drops by more than 2 ½ feet per year, the permit requires that well be shut down until the water level recovers.
- Mr. Pineda asked what steps would the city take if the situation went from critical management scenario to crisis management? Would they curtail Intel's use? Dr. Hawley suggested that they should look at agricultural applications because agriculture uses hundreds of times more water than Intel. Most of the agriculture happens downstream. Mr. Pineda suggested that industry should be curtailed first. Dr. Hawley reminded the group that industry was a very small player and would not make a large impact.
- Dr. Hawley pointed out that the whole community is actively working to conserve water. He also pointed out that Intel does not consume water. The water exiting from Intel is so pure that it needs to be mixed before it is discharged. He went on to say that 50 percent of the water used by Albuquerque and surrounding communities is put back into the river as effluent from waste treatment plants.
- Mr. Kirkpatrick asked whether there was any relationship between the wells in Corrales and the wells being used by Intel. Dr. Hawley responded that the 300-foot wells in Corrales were 600 to 800 feet above the level of the aquifer used by Intel and it was separated by several layers of impermeable clay. Any impact would be very long term. The changes that Mr. Kirkpatrick is seeing in his well is due to changes in the river basin. Mr. Kirkpatrick asked whether the people in Corrales or in Rio Rancho using private wells were being affected by what Intel is pumping out of the aquifer? Mr. Webb interjected that there were domestic wells in Rio Rancho that were a thousand feet deep. He pointed out that before Intel got permits for their production wells, they had to drill monitoring wells to verify that the production wells were not pulling down the aquifer. After monitoring them for five or so years, the Office of the State Engineer said Intel had proven

their point and they could abandon the monitoring wells. Intel came to the City of Rio Rancho and asked whether the city wanted to take over management of the wells. The wells are worth about $300 thousand apiece and still provide important data on the aquifer.

- Mr. Kirkpatrick offered that the people of Corrales were concerned that if the aquifer that they were using ran dry, the value of their houses would plummet. The average citizen does not know that the aquifers are separated. Mr. Webb pointed out that the people of Corrales were their own worst enemy. With the ever-increasing population putting pressure on the relatively shallow aquifer, it is possible the aquifer could drop enough that people would be without water. He suggested that a city water system could help alleviate that problem.
- It was pointed out that the average citizen viewed the aquifer as a single entity and that Intel's claim that they were not drawing down the aquifer was based on the fact that they had "the longest straw". The scientists need to correct that misperception. Dr. Hawley said they had been trying to do that for some time. The USGS completed their study in 2001 and reported out, but that people were distracted in 2001 by 9/11. Data is still being collected. The state has had workshops to try and explain the results but with limited success.
- Mr. Bartlit asked whether there are wells in Rio Rancho, Corrales or Albuquerque that have been shut down due to contamination from Intel or other sources? Mr. Webb said not to his knowledge. There were two New Mexico Utility wells (a private utility) that they had to move because they were in the Spartan plume, which is a Superfund site. Intel's waste-water is discharged into the Albuquerque system that is downstream of Corrales and Rio Rancho.
- Mr. Bartlit asked about spills in the Intel plant. Mr. Webb said that all water that is collected on the Intel plant is collected at a single point. That point is continuously monitored and to his knowledge had never detected any contamination.
- Mr. Littlejohn asked the panelists about changes in water quality, and Mr. Kirkpatrick asked whether drawing the water table down in an aquifer would decrease the quality of the water being pumped out? Mr. Webb said the most likely source of contamination is poor quality domestic well construction. If water from a septic system finds a poorly constructed well shaft, the water will find that path down the shaft and contaminate the aquifer.
- Roberta King asked about two Rio Rancho wells that were shut down a few years ago because of contamination. What was the contaminate and what was the source? Mr. Webb answered the wells were shut down because they did not meet the standards for water quality. Both wells were high in arsenic. The standard for arsenic was changed in 2006 from 50 mg/ml to 10 mg/ml, putting the wells over the standard. Arsenic is not a man-made contaminate, but a naturally occurring minerals in the water from volcanic action. All wells on the west side and Albuquerque have arsenic content.

Pumps 13 and 9 are the pumps that were shut down. Water quality did not change, the regulations changed. Pump 9 is still being pumped periodically. There is a debate in Congress and within the EPA what the standard should be. The perception of risk is changing.

- Ms King said that several years ago "Rio Rancho used to put out a report that told which wells were where and what their mineral contents were. They no longer do that." Mr. Webb corrected her, saying that it was a Federal requirement that the information on each well be published once a year, prior to June 1st. The report does not have the analytical data on each well, but it does contain the maximums from the system.
- Mr. Pineda stated that the arsenic was not put into the aquifer by man. He asked whether the panel could expand on this. Dr. Hawley said it was naturally occurring arsenic in the water. There is a paper put out by Christian Dawton with the EPA in the Las Vegas region talking about public perception of water quality. He has determined that there are two effects: the placebo effect, where people get a pill or treatment and are cured because they believe the pill works. The other effect is the nocebo effect where a person is getting sick because they are unhappy and disturbed. The effect is real. Mr. Webb stated that public water is higher in quality than bottled water.
- Mike Williams asked about variability in the Pojoaque valley with differences in uranium. Is it the same with arsenic? Arsenic is not associated with the volcanic basalt, it comes from the volcanic regions with high silica content, such as the Bandolier tuft, or materials associated with the Jemez Caldera. Riolite is the material that under alkaline conditions tends to release minute amounts of arsenic precipitate. In contrast, the water coming out of the Tijeras aquifer has no arsenic because it is surrounded by granite. Quality in well water is variable between wells in the same aquifer due to differences in the local geology.
- Mr. Kirkpatrick asked how the Rio Rancho & Intel aquifers are getting recharged? What is the source? Dr. Hawley provided a detailed description of how water can flow laterally through aquifers based on differences in pressure between the aquifers. The aquifers are in many cases old riverbeds that have been cut off due to geologic activity.
- Mr. Pineda asked how many years it would take to completely recharge the aquifers? Dr. Hawley reminded everyone that this area has been in a drought for the past 12 thousand years and that the aquifers would be recharged during the next ice age.
- Mr. Pineda asked why the cities and counties continue to push for growth? Dr. Hawley responded that people don't manage water resources well enough. Mr. Webb added that a study done by the census bureau, the anticipated growth would mean a population in the greater Albuquerque area of over 600,000 by 2050, with half of that in Sandoval County. There is nothing that can be done to stop that influx. Most municipalities in the sunbelt face the same problem. People like living in Albuquerque and Rio Rancho. The number one immigrants to Rio Rancho are Albuquerque

residents. The growth can't be curtailed so there are other potential solutions.

- There are plans to start reusing the effluents from waste-water. The waste-water plants are being built that will allow the injection of cleaned and purified wastewater back into the aquifer. Mr. Webb's example of why you cannot manage the growth was to say that there was enough water provided everyone that came to Albuquerque after 1962 had to leave. It is just not feasible to limit growth in that manner.

REPORT ON INTEL'S WATER USE—PRESENTATION DECEMBER 21, 2005

Frank Robinson, an employee with 13 years at Intel, provided an overview and answered questions regarding Intel's water use. A copy of Frank's presentation is attached in the appendix.

- Several Intel facilities are located in very arid areas so the company has placed an emphasis on water reduction and conservation.
- The target water usage rate is 3.9 million gallons per day without conservation.
- Wastewater goes to the City of Albuquerque Wastewater Treatment Plant and is discharged after
- treatment.
- Prior to 1995 100% of water used was fresh water.
- Conservation - Use xeriscape to reduce irrigation water use which saves 55 gpm (gallons per minute).
- Reclaimed - using wastewater in other applications.
- Ultra pure reclaim water is used in the cooling towers/scrubbers 770 gpm reduction.
- Improve efficiency of reverse osmosis process used to create ultra pure water from 50% to 85-95%.
- New Mexico is the only plant to build HERO system which saves 328 gpm = 3.05 million gallons per day.
- The goal is to keep to the commitment of 3.9 million gallons per day even with plant expansion.
- 3.1-3.9 million gallons per day - % from Rio Ranch vs. % from wells.
- Working Group Questions and Comments:
- Is there monitoring of water quality and water levels beyond the plant? Response: Initial monitoring was done before state well permit was issued.
- All of Corrales is on wells. What is the interaction between Intel and all other wells? What is the quantity and quality of the water before and after Intel? Response: We will need to bring in others agencies to help respond to these questions.
- Is Intel reinjecting wastewater? Response: No. Intel was approached by the City of Albuquerque and participated in the city's feasibility study to reinject water. The project was determined to be feasible but capital costs were very high so the project did not move forward. Intel does not reinject water into the aquifer in New Mexico.

- Is there a positive financial return to conserve? Response: Generally it is cheaper to use fresh water than water conservation. The cheapest source of water in most states is groundwater. However, Intel is continuing to look for ways to conserve water because it is the right thing to do.
- What are the water limits in the Albuquerque permit? Response: Intel has pretreatment requirements. Albuquerque monitors.
- Are metals and hydrocarbons in the water? Response: Yes.

APPENDIX

INTEL WATER MANAGEMENT PRESENTATION

SHOMAKER REPORT

INTEL SUMMARY, 4-12-06

INTEL SUMMARY, 9-23-06

WATER PRESENTATION

December 14, 2004

Slide 1

Intel and Water Conservation

Community Advisory Panel (CAP) Presentation
December 14, 2004

Frank Robinson
Facilities Process Engineering Supervisor
Intel Corporation – New Mexico

Slide 2

Agenda

- Problem Statement
- Definitions
- Breakdown of water use at Intel and Middle Rio Grande
- New Mexico Water Management Initiatives
- Questions/Discussion
- Backup Slides

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Slide 3

Problem Statement

- Water is an emerging global and local issue
  - Issues vary by geography
  - Our #1 environmental perception concern
- Few water conservation projects have a positive financial return
- Challenge: do the right thing while -
  - Addressing public concerns
  - Making sound business decisions
  - Managing risks (process, supply, flexibility, etc.)

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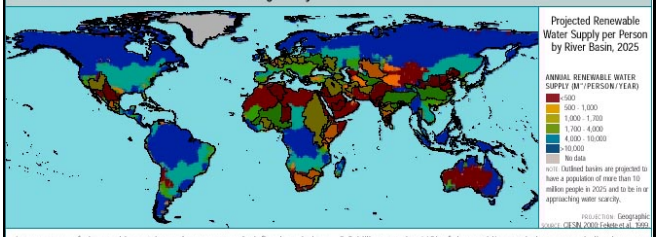
Slide 4

Global Access to Fresh Water

40% Of The World Will Live In Water-Scarce Regions By 2025



Large areas of the world experience "water stress," defined as below 1,700 cubic meters per year per person.[10] In areas where supplies drop below 1,000 cubic meters per person, shortages disrupt both food production and economic development unless the region is wealthy enough to apply new technologies for water conservation and re-use. An estimated 2.3 billion people, 41% of the world's population, currently live in water-stressed areas. By 2025, 3.5 billion are projected to live in water-stressed areas.[11] Water scarcity has also led to conflict between upstream and downstream areas within countries, and tense relations between countries sharing a transnational waterway or watershed.[12]

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Slide 5

Water Management Definitions

- **Total Water Requirement**
  - Sum of fresh water and water offset by fresh water savings activities. Provides a parameter of fresh water use if no water management was in place.
- **Total Fresh Water Use**
  - Potable or fresh water from an outside source (private or governmental entity) or on site sources (wells, reservoirs, etc.) used on an Intel campus
- **Fresh Water Savings**
  - Using less fresh water at an Intel facility, or returning water to a potable water source, thereby making water available for other community uses.
- **Recycle Water**
  - Industrial wastewater that is captured, treated and reused in the *same* application or system.
- **Reclaim Water**
  - Industrial wastewater that is captured, treated and reused in a *different* application or system.
- **Reuse Water**
  - The sum of recycle and reclaim water
- **Grey Water**
  - Sub-set of reclaim which is non-potable treated effluent water from a municipal or private wastewater treatment facility or other accepted non-potable water source

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Slide 6

Rio Grande Basin Water Data 1995

RR campus is 0.16% of Rio Grande River basin water use

New Mexico	1990	2000	2010 est.
Population (000)	1,515	1,819	2,300

Sector 1995	MGD	%
Ag Irrigation	1276	68%
Evaporation	309	16
Municipal Supply	219	12
Mining	27	1
Other - self supplied	47	3
TOTALS	1878	100%

Data Source: New Mexico State Engineer's Office

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Slide 7

Sandoval + Bernalillo County Water Data 2000

- RR campus is 1.2% of Sandoval + Bernalillo County water use
- 3% savings in two county irrigation or municipal = 1 RR campus

Sector 2000	MGD	%
Municipal Supply	117	45%
Ag Irrigation	114	44
Reservoir Evaporation	9.2	4
Domestic - self supplied	7.5	2
Other - self supplied	12.9	5
TOTALS	261	100%

Data source: New Mexico State Engineer's Office

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Slide 8

Typical Semiconductor Fab Water Use

Application	Water Use
Ultra-pure water	50 - 60%
Cooling towers	20 - 30%
Scrubbers	5 - 8%
Irrigation	3 - 6%
Domestic, others	5 - 10%

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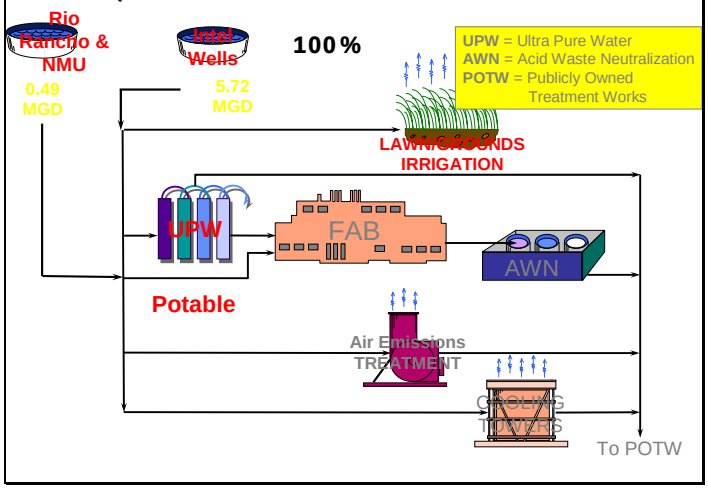
Slide 9

Simplified Water Model – No Conservation



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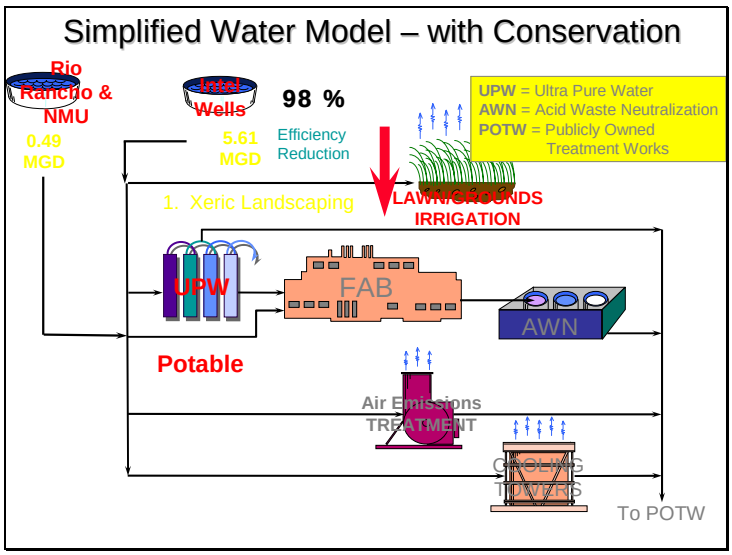

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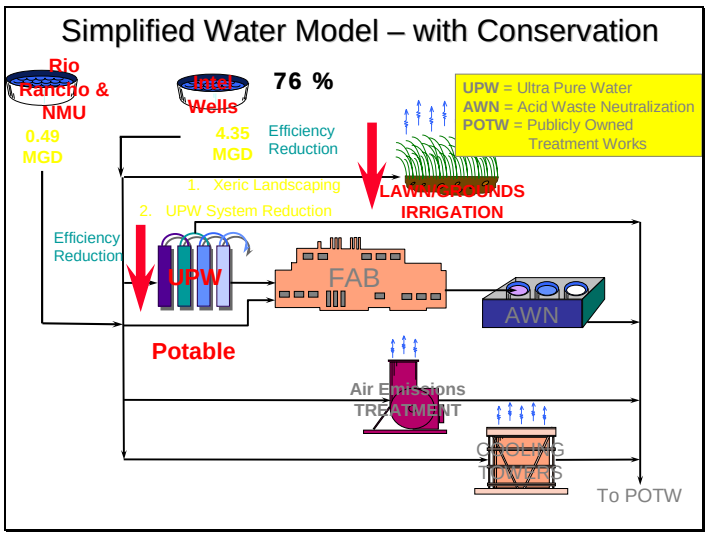
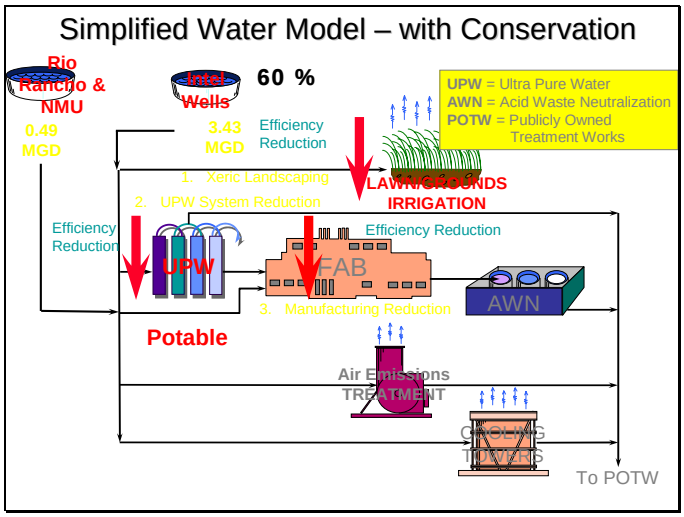


Slide 12



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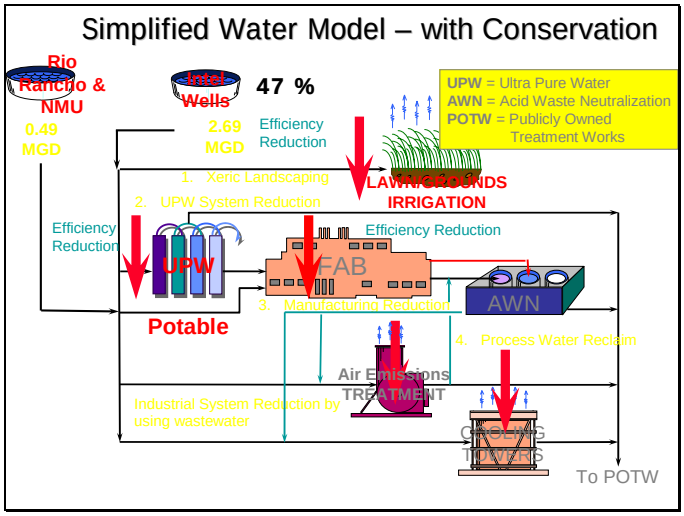

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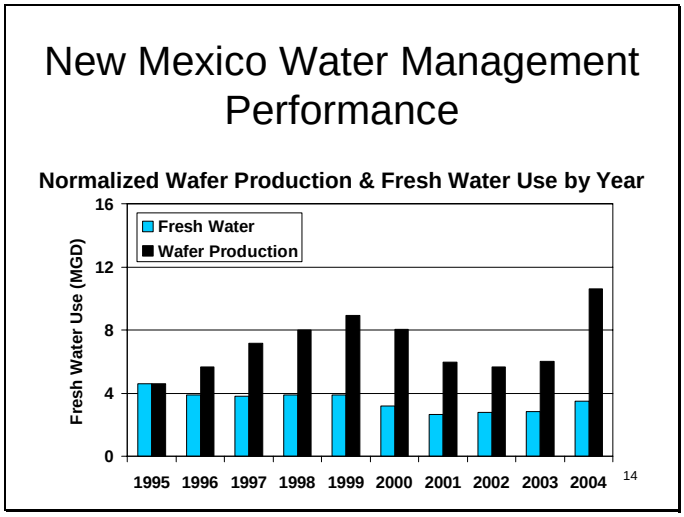

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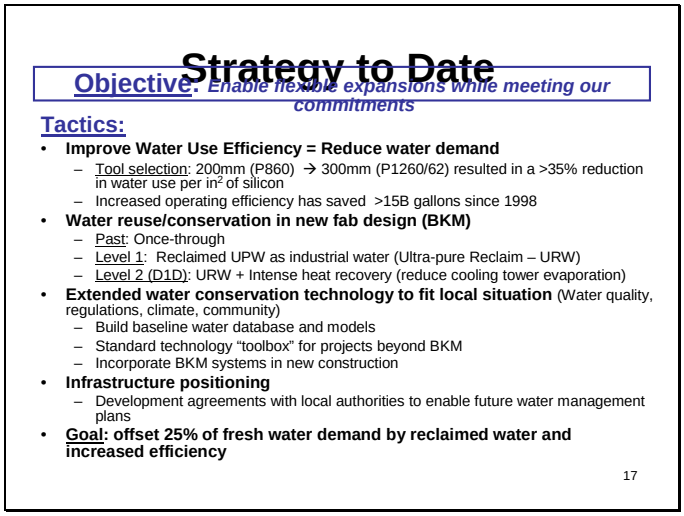
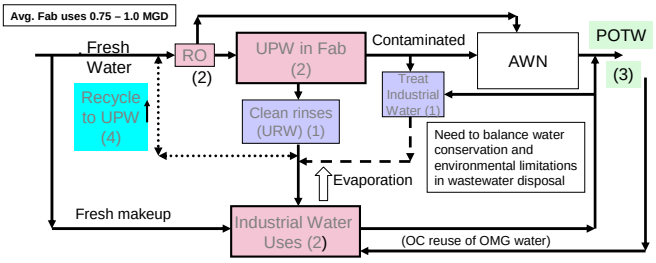


Slide 18

Water Reuse BKMs



- Current boundary condition – UPW is supplied by fresh water only
- Water reuse approaches
  1. **Reclaim onsite**: URW reclaimed for industrial water, *Treated industrial water*
  2. **Production/use efficiency:** Increase RO efficiency, process equipment efficiency, intense heat recovery, *landscaping improvements (xeriscaping)*
  3. **Reuse off-site**: *Irrigation (F18), re-injection (OC)*

Underlined – D1D BKM

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Future Opportunities

Application	Water Use	Current BKMs	Future Opportunities
Ultra-pure water	50 - 60%	• Tool use reduction • UPW efficiencies	• Process goal • UPW reuse
Cooling towers	20 - 30%	• URW • Intensive heat recovery	Reuse treated effluent – HF, SCW, ammonia, etc.
Scrubbers	5 - 8%	URW	
Irrigation	3 - 6%	Conservation	
Domestic, others	5 - 10%	Conservation	• Off site reuse • Community projects

As we reach a point of diminishing returns for internal reuse, more focus will shift to process and external opportunities

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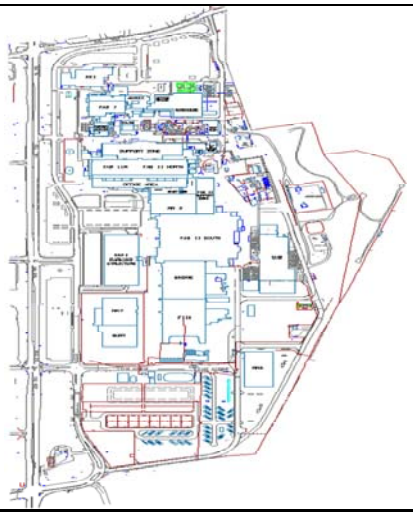

Intel Rio Rancho campus

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Slide 21

Intel New Mexico Water Conservation History

- In 1994, 3.7 million gallons of fresh water were consumed per day
- Site manufacturing expansion models predicted as high as 16 million gallons per day in the future
- Community and internal concern over impact to local water supply moved Intel to adopt a dedicated Industrial Water Management Program

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What Solutions were implemented?

- 1994 – 1st Intel Water Reuse Systems
  - Treated Industrial Water system implemented
  - UltraPure Reclaim Water system designed into Fab 11
- 1995 – Improved Water Efficiency Project
  - Antiscalent chemicals piloted on RO system raise recovery to 65%
- 1996
  - High Efficiency Reverse Osmosis (HERO) system is successfully piloted 85% RO recovery
- 1997
  - HERO is funded and construction begins
- 1999
  - HERO is operational. RO recovery at 85%
  - Process Reclaim Water (PRW) system piloted
- 2000

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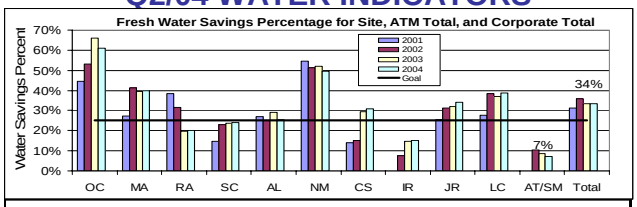
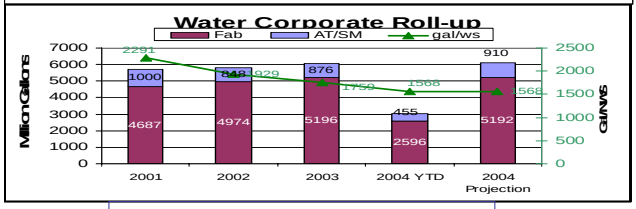
Slide 23

Q2/04 WATER INDICATORS





- **Exceeding 25% fresh water savings goal in 1H'04**
- **Normalized use down 11% from 2003**

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HISTORICAL AND CURRENT WATER USE IN THE MIDDLE RIO GRANDE REGION

prepared by

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prepared for

Middle Rio Grande Council of Governments
317 Commercial NE, Suite 300
Albuquerque, New Mexico 87102
and the
Middle Rio Grande Water Assembly
P.O. Box 9844
Albuquerque, New Mexico 87117-9844

June 2000

HISTORICAL AND CURRENT WATER USE IN THE MIDDLE RIO GRANDE REGION

EXECUTIVE SUMMARY

The Historical and Current Water Use in the Middle Rio Grande Region project was carried out under a Professional Services Agreement between John Shomaker & Associates, Inc. (JSAI) and the Middle Rio Grande Council of Governments (MRGCOG), working in cooperation with the Middle Rio Grande Water Assembly. This project is part of the Middle Rio Grande regional water planning process and is supported by funding from the Interstate Stream Commission (ISC). The project follows the ISC's Regional Water Planning Handbook (1994) and requirements of MRGCOG and the Middle Rio Grande Water Assembly Water Demand Working Group.

The Middle Rio Grande Region, as the term is used herein, encompasses the portion of the Rio Grande valley from Cochiti Dam south to the southern boundary of Valencia County. Almost all of three counties, Sandoval County, Bernalillo County, and Valencia County, as well as a small portion of Torrance County, are located within the region. Eleven tribal jurisdictions and twelve municipalities (including Albuquerque, the largest city in New Mexico) are located within the region. The Middle Rio Grande Region is subdivided into three subregions according to major watershed boundaries: the Rio Puerco, Rio Jemez, and Middle Rio Grande Valley (MRGV) (Fig. 1A in report).

The study includes a compilation of water-use data from many sources. These sources include publications and publicly-available data from the New Mexico Office of the State Engineer (NMOSE), the U. S. Bureau of Reclamation, the Middle Rio Grande conservancy District (MRGCD), as well as publicly-available data from the U.S. Geological Survey, the City of Albuquerque, and numerous other public water suppliers. The historic and current water-use data found in these sources were divided into specific water-use categories, as defined by the NMOSE and the Interstate Stream Commission (ISC).

Water-use data are presented in the form of *withdrawal*, water pumped from ground water or diverted from surface water, and *consumption*, *consumptive use*, or *depletion*, which is water that is removed from the surface- and ground-water systems via evaporation, transpiration, or other processes. All water quantities are expressed in acre-feet, the volume of water necessary to cover an acre to the depth of one foot. There are 325,851 gallons in an acre-foot of water.

In 1995, within the study area, riparian vegetation accounted for 29 percent of consumptive use; irrigated agriculture, 28 percent; public water supply, 25 percent; open-water evaporation, 16 percent; and all other consumption categories fill out the remaining 2 percent of water consumption. Total consumption in 1995 was about 340,000 acre-feet.

The amount of water withdrawn each year in Sandoval, Bernalillo, and Valencia counties combined is about 600,000 acre-feet. Roughly half of those withdrawals are for irrigated agriculture, and one quarter is withdrawn for public water-supply systems in the region. Sixteen percent of withdrawals are by riparian vegetation, and 9 percent represent open-water evaporation.

Water is supplied to the different categories from either ground- or surface-water sources. Irrigated agriculture derives its water mostly from the Rio Grande. Water diverted to, but not consumed by, irrigated agriculture either returns directly to the surface-water system or seeps into the shallow ground-water system. Open-water evaporation is obviously withdrawn and consumed from surface-water sources. All public water-supply and self-supplied commercial, industrial, domestic, mining, and power categories derive their water primarily from groundwater sources, except for a very small amount of surface water used for commercial fish hatcheries and public water supply. In general, return flow from self-supplied and municipal systems processed by municipal wastewater treatment facilities is returned to the Rio Grande. Some water evaporates and is lost during the treatment process, and some is reused for landscaping and crop irrigation. Some water is sent to septic systems and returns to the groundwater system. Finally, riparian vegetation (which includes indigenous vegetation like cottonwoods and exotic species such as salt cedar) extracts its water from both surface- and shallow ground-water sources. Overall, roughly equal amounts of water are consumed or depleted from surface- and ground-water sources.

Valencia County leads the Middle Rio Grande region with consumptive use of water, a result of its extensive agricultural development. Bernalillo County is second, with consumption driven by water demand for the City of Albuquerque, New Mexico's largest metropolitan area. Though Sandoval County water use today is less than in either of the other counties, significant population and industrial growth is occurring.

JSAI intends this work to form a basis for projecting water demand in the future, and to highlight the current status of water-demand data availability and quality. Many sources provide very good water-use data, and data collection and processing methods have improved over time. There is still room for improvement, however, and an increase in the quality of water-demand data and the development of a centralized data repository would greatly assist the water planning process in the Middle Rio Grande region. During the process of this project the study team did find inconsistencies in data, but the team would be surprised if improved data quality were to significantly change the currently reported amounts.

Note: Entire document available electronically. Please contact Stephen Littlejohn at swlittlejohn@comcast.net.

MEMORANDUM
OFFICE OF THE STATE ENGINEER
WATER RESOURCE ALLOCATION PROGRAM
WATER RIGHTS DIVISION

Date: **April 12, 2006**

File No: **RG-57125, RG-57125-S, and RG-57125-S-2**

To: **John D' Antonio, Jr. P.E., State Engineer**

Through: **Jess Ward, District 1 Supervisor**
Elizabeth Cervantes, District 1

From: **Amy Louise, District 1**

Subject: **Summary of Intel Permit**

SUMMARY AND CONCLUSION

On June 10, 1994, Permit Nos. RG-57125, RG-57125-S, and RG-57125-S-2 were approved to divert 3,248.60 acre-feet per year from three wells.

Table below shows diversion, approved return flow, and depletion amounts. Approved return flows exceed the depletions; therefore, Intel is augmenting the Rio Grande. In approximately year 2013, the return flows will equal the depletions. At that time, Intel will be required to offset the effects to the Rio Grande.

YEAR	DIVERSION	RF (acre-feet)	RF %	GB (acre-feet)	GB-RF (acre-feet)
1995	965.1	820.3	85*	105.15	-715.15
1996	3191.0	2727.1	85	490.58	-2236.52
1997	3178.0	2701.3	85*	913.06	-1788.24
1998	3245.2	2702.8	83.3	1201.69	-1501.11
1999	3099.9	2478.2	79.9	1395.03	-1083.17
2000	3051.4	2478.3	81.2	1524.56	-953.74
2001	2484.9	2042.9	82.2	1563.72	-479.18
2002	2774.9	2269.3	81.8	1595.73	-673.57
2003	2831.0	2126.6	75.1	1660.98	-465.62
2004	2773.6	2430.2	87.6		
2005	3162.0	2700.8	85.4		

*The State Engineer will only accept a return flow credit up to 85% for water diverted from wells RG-57125, RG-57125-S, and RG-57125-S-2 even though Intel reported 88% and 89% credits for years 1995 and 1997, respectively.

AL: al

Intel Corporation
New Mexico Site Materials
and Services
Central Engineering

Mail Stop RR8-103
4100 Sara Road
Rio Rancho, NM 87124
Phone: 505-794-0885
Fax: 505-794-0887

Date: 4 January 2006

Jim Sizemore, Chief
Water Rights Division
State Engineer Office
Post Office Box 25102
Santa Fe, New Mexico 87504-5102

Subject: Permits RG-57125, RG-57125-S, and RG-57125-S-2
2005 Annual Production and Return Flow Credit Report

Dear Mr. Sizemore,

Enclosed is the Intel 2005 Annual Production and Return Flow Credit Report to the New Mexico State Engineer, January 2006. The report is intended to be self-explanatory. If you have any question at all, please feel free to call me at (505) 794-0885.

Sincerely,

William (Bill) H. Judd, CEM, PE
FacilitiesEngineer

WHJ/whj

Enclosure: Intel 2005 Annual Production and Return Flow Credit Report to the New Mexico State Engineer, January 2006

cc:	Jess L. Ward	District I, State Engineer Office
	Charles T. DuMars, Esq.	Law & Resource Planning Associates, P.C.
	Christina J. DuMars, Esq.	Law & Resource Planning Associates, P.C.
	Steve Bockemeier	City of Albuquerque
	John Stomp	City of Albuquerque
	Robert L. Swartwout	New Mexico Utilities, Inc.
	Bob Gay	New Mexico Utilities, Inc.
	Frank R. Robinson	Intel Corp.
	Richard B. Hildebrand	Intel Corp.

Intel 2005 Annual
Production and Return Flow Credit Report to the New Mexico State Engineer

January 2006

Production Summary:

Intel produced well water is not for potable use. It is used to make ultra pure water for semiconductor manufacturing and for other industrial uses. Total production from all Intel wells for 2005 is 3,162.0 acre-feet compared with an annual production limit of 3,248.6 acre-feet. Therefore, in 2005 Intel produced 97% of the annual production limit.

Intel Return Flow Credit Methodology:

Intel meters all water coming on to the Site. This includes both the utility system water entering the Site and the Intel well production water. Intel also meters the sanitary sewer effluent leaving the Site. Intel receives return flow credit for that portion of the sanitary sewer effluent leaving the site that is in proportion to the amount of Intel well water production divided by the total amount of water brought on to the Site. This methodology was approved by Mr. Paul Saavedra on 29 June 1995.

Table of Symbols Used for Return Flow Credit Calculations

iRFC = Intel return flow credit.
St = Total sanitary sewer discharge during reporting period.
Wi = Total Intel well water production during reporting period.
Wt = Combined utility and Intel well water total for reporting period.
Wu = Total utility water brought on Site during reporting period.

$Wt = Wi + Wu$
$iRFC = St(Wi/Wt)$

Return Flow Credit Summary:

Using the return flow credit methodology previously described, Intel has a return flow credit of 2,700.8 acre-feet for 2005. This return flow credit is 85.4% of the Intel water production for 2005.

An electronic database error resulted in the loss of the 1-Dec-2005 meter readings used for return flow credit calculations. Meter readings taken 15-Dec-2005 were used in place of the 1-Dec-2005 meter readings. That is why 15-Dec-2005 appears in the following table in place of Nov-2005. Therefore the November period spans 1-Nov-2005 to 15-Dec-2005 and the December period spans 15-Dec-2005 to 1-Jan-2006.

Summary Table:
January 2005 through December 2005

Month	St acre-feet	Wi acre-feet	Wt acre-feet	iRFC acre-feet	iRFC Percent of Wi
Jan-05	247.4	262.6	280.5	231.6	88.2%
Feb-05	215.9	249.4	283.3	190.0	76.2%
Mar-05	265.8	277.6	295.4	249.8	90.0%
Apr-05	281.0	289.0	319.0	254.6	88.1%
May-05	258.0	260.9	307.7	218.7	83.8%
Jun-05	233.3	247.8	292.1	197.9	79.9%
H1 Subtotal	1,501.3	1,587.4	1,778.0	1,342.6	84.6%
Jul-05	245.8	260.7	314.6	203.7	78.1%
Aug-05	251.2	261.0	313.2	209.4	80.2%
Sep-05	240.5	239.9	289.1	199.6	83.2%
Oct-05	263.6	272.9	295.9	243.1	89.1%
15-Dec-05	389.0	390.9	414.7	366.7	93.8%
Dec-05	144.6	149.2	159.0	135.6	90.9%
H2 Subtotal	1,534.9	1,574.7	1,786.6	1,358.2	86.3%
Total	3,036.2	3,162.0	3,564.7	2,700.8	85.4%

MEMORANDUM
OFFICE OF THE STATE ENGINEER
WATER RESOURCE ALLOCATION PROGRAM
WATER RIGHTS DIVISION

Date: September 23, 2004

File No: RG-57125, RG-57125-S, and RG-57125-S-2

To: John D' Antonio, Jr. P.E., State Engineer

Through: Jess Ward, District 1 Supervisor
Tom Morrison, Hydrology Chief

From: Amy Louise, District 1

Subject: Summary of Intel Permit

SUMMARY AND CONCLUSION

On June 10, 1994, Permit Nos. RG-57125, RG-57125-S, and RG-57125-S-2 were approved to divert 3,248.60 acre-feet per year from three wells.

Table below shows diversion, approved return flow, and depletion amounts. Approved return flows exceed the depletions; therefore, Intel is augmenting the Rio Grande. In approximately year 2013, the return flows will equal the depletions. At that time, Intel will be required to offset the effects to the Rio Grande.

YEAR	DIVERSION	RF (acre-feet)	RF %	GB (acre-feet)	GB-RF (acre-feet)
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2002	2774.9	2269.3	81.8	1595.73	-673.57
2003	2831.0	2126.6	75.1	1660.98	-465.62

*The State Engineer will only accept a return flow credit up to 85% for water diverted from wells RG-57125, RG-57125-S, and RG-57125-S-2 even though Intel reported 88% and 89% credits for years 1995 and 1997, respectively.

Intel and previous permit holders have transferred consumptive use rights to Permit No. RG-57125, RG-57125-S, and RG-57125-S-2 that total to 171.14 afy.

HISTORY

On April 5, 1993, Intel Corporation filed Applications RG-57125, RG-57125-S, and RG-57125-S-2.

On June 10, 1994, Findings and Order was signed granting Permit Nos. RG-57125, RG-57125-S, and RG-57125-S-2 that allows a maximum diversion of 3,248.60 acre-feet per year from three wells. Under these permits, Intel is obligated to offset surface water impacts on the Rio Grande caused by the diversion of groundwater under Permit Nos. RG-57125, RG-57125-S, and RG-57125-S-2. Valid offsets include measured effluent that is discharged directly to the Rio Grande and transferred consumptive use water rights. The portions of effluent acceptable for offset are only those amounts resulting from the diversions under Permit No. RG-57125, RG-57125-S, and RG-57125-S-2.

On May 13, 1998, letter from Paul Saavedra, Chief Water Rights, to Donald L. Hutchins, Strategic Operations Manager of Intel Corporation says, "Therefore, in accordance with condition no. 3, Permit no. RG-57125 et al., approved on June 10, 1994, the State Engineer hereby relieves the applicant, Intel Corporation, from further monitoring requirements under that permit."

On August 16, 1999, License To Appropriate the Underground Waters of the State Of New Mexico was granted to Intel Corporation to appropriate an amount of water not to exceed 3,248.6 acre-feet per year from three wells subject to the conditions of approval as stated in the Findings and Order adopted June 10, 1994 for industrial purposes. See attached.

Intel and previous permit holders have transferred consumptive use rights to Permit No. RG-57125, RG-57125-S, and RG-57125-S-2, which total to 171.14 afy. Refer to *Table 1* for the OSE File No., Date of Approval, and the amounts of approved Consumptive Use Rights.

FILE NO.	DATE OF APPROVAL	CONSUMPTIVE USE RIGHTS (ACRE-FEET)	
		APPROVED	CUMMULATIVE
SD-03067	01/24/2002	124.32	124.32
SD-05051	05/06/2003	13.02	137.34
SD-04480-A	09/16/2003	33.80	171.14

Table 1: Intel's available consumptive use rights.

PENDING WATER RIGHTS DIVISION EVALUATIONS

Under condition 8 of Findings and Order signed June 10, 1994, "Any depletion effects to the Rio Grande resulting from this application, which are not offset by a return flow credit approved by the State Engineer, must be offset by retirement of existing water rights on the Rio Grande upon application for permit to retire those rights to the State Engineer."

05269 into RG-57125 et al.

On August 25, 2003, Application No. *05269 into RG-57125* et al. was filed for Permit to Change Point of Diversion and Place and Purpose of Use from Surface to Ground Water within the Rio Grande Underground Basin. Notice for Publication was issued on September 18, 2002 instructing the

applicant to publish the notice in *The Observer* (Sandoval County), *The Albuquerque Journal* (Bernalillo County), *Valencia County News Bulletin* (Valencia County), and *El Defensor Chieftain* (Socorro County). A Revised Notice was not issued because only a period after "et al" was required per e-mailed dated October 3, 2003. *The Observer* had to re-publish notice because it "was inconsistent with their final approved proof" per e-mail dated November 25, 2003. Affidavits of Publication were filed November 4, 13, and 19, and December 3, 11, and 12, 2003. The Application was timely protested by Pueblo of Isleta on October 31, 2003. On August 26, 2004, the Pueblo of Isleta withdrew their protest. The Application was remanded to Water Rights Division on September 1, 2004. The evaluation was completed on September 15, 2004 by Amy Louise, District 1, and is currently under review by Nancy Cunningham, District 1.

Under Application No. 05269 into RG-57125 et al, the applicants propose to discontinue the diversion of 40.320 acre-feet of water per annum, inclusive of a consumptive use of 28.224 acre-feet per annum, from the Rio Grande with a point of diversion on the Rio Grande within the SW¼ NE¼ NE¼ of Section 1, Township 1 South, Range 1 West, NMPM, at the San Acacia Diversion Works, for the irrigation of 13.44 acres of land owned by Mr. Edward T. and Mrs. Frances Fratello described as Tract 36B, MRGCD Map 156, further described as within NW¼ of Section 13, Township 2 South, Range 1 West, NMPM.

Further, the applicants propose to commence the diversion of the above-described water rights from existing Well No. RG-57125 located at X=379,368 feet, Y=1,537,963 feet; RG-57125-S located at X=378,863 feet, Y=1,536,600 feet; and RG-57125-S-2 located at X=377,213 feet, Y=1,535,010 feet, all within the NMCS, Central Zone, Town of Alameda Grant, Sandoval County, on land owned by Sandoval County, leased and controlled by Intel Corporation as provided in the Notice of Publication duly published on April 28, May 5, and May 12, 1993 on which the Intel Application was initially granted, for all purposes allowed under RG-57125 et al. including irrigation, domestic, commercial, industrial and other related purposes at all facilities and properties controlled by Intel Corporation, a 179.87-acre site, more or less. The move-to land and wells are generally located within or near Rio Rancho, Sandoval County, just southeast of the intersection of Sara Road and State Highway 528.

06479 into RG-57125 et al., 06480 into RG-57125 et al., and 06481 into RG-57125 et al.

On July 19, 2004 three separate applications were filed by Intel Corporation along with three different co-applicants and application numbers as follow: 1) Tony and Amy Baca filed Application No. SD-06479 into RG-57125 et al., 2) Dinah and Marcimiliano Baca filed Application No. SD-06480 into RG-57125 et al., and 3) Dinah Baca and Marcimiliano Baca filed Application No. SD-06481 into RG-57125 et al. Said applications were filed with the STATE ENGINEER for permit to Change Point of Diversion and Place and Purpose of Use from Surface to Ground Water within the Rio Grande Ground Water Basin of the State of New Mexico.

In the first application, SD-06479 into RG-57125 et al., the co-applicants propose to discontinue the diversion of 15.00 acre-feet of surface water per annum, inclusive of a consumptive use amount of 10.50 acre-feet per annum, with a point of diversion on the Rio Grande located in the NE1/4 NE1/4 SW1/4 of Section 24, Township 8 North, Range 2 East, NMPM, at the Isleta Diversion Works of the

MRGCD, for the irrigation of 5.00 acres of land owned by Tony and Amy Baca, described as the easterly portion of Tract C1 Lands of Gillie Sanchez, MRGCD Map 87.

In the second application, SD-06480 into RG-57125 et al., the co-applicants propose to discontinue the diversion of 23.46 acre-feet of surface water per annum, inclusive of a consumptive use amount of 16.42 acre-feet per annum, from the New Belen Acequia with a point of diversion on the Rio Grande in the NE1/4 NE1/4 SW1/4, Section 24, Township 8 North, Range 2 East, NMPM, at the Isleta Diversion Works of the MRGCD, for the irrigation of 7.8185 acres of land described as Tract D1 and D2, Amended Replat, Lands of Gillie Sanchez, MRGCD Map 87, Valencia County. Tract D1 is owned by Jonathan Trujillo and Patricia Griego and Tract D2 is owned by Glenn A. Pyle and Kathryn Desiree Griego.

In the third application, SD-06481 into RG-57125 et al., the co-applicants propose to discontinue the diversion of 12.414 acre-feet of surface water per annum, inclusive of a consumptive use of 8.690 acre-feet per annum, from the New Belen Acequia with a point of diversion on the Rio Grande at the Isleta Diversion Works of the MRGCD, located in the NE1/4 NE1/4 SW1/4 of Section 24, Township 8 North, Range 2 East, NMPM, for the irrigation of 4.138 acres of land owned by Dinah and Marcimiliano Baca, described as Tract C2, Lands of Gillie Sanchez, MRGCD Map 87.

All of said tracts of land are generally located about five miles north of Belen and a quarter mile north of the intersection of Square Deal Road and Sea Bell Road, Valencia County.

Intel Corporation and the three co-applicants further propose to commence the diversion of the three above-described declared water rights from existing wells RG-57125 located at X=379,368 feet, Y=1,537,963 feet; RG-57125-S located at X=378,863 feet, Y=1,536,600 feet; and RG-57125-S-2 located at X=377,213 feet, Y=1,535,010 feet, all NAD27 NMSPCS, Central Zone, Town of Alameda Grant, Sandoval County, on 179.87 acres of land owned by Sandoval County, leased and controlled by Intel Corporation as provided in the Notice of Publication duly published on April 28, May 5, and May 12, 1993 on which the Intel Application was initially granted, for all purposes allowed under RG-57125 et al. including irrigation, domestic, commercial, industrial and other related purposes at all facilities and properties controlled by Intel Corporation. The move-to land and wells are generally located adjacent to Rio Rancho, Sandoval County, immediately southeast of the intersection of Sara Road and State Highway 528.

WATER CONSERVATION

A Water Conservation Plan has not been filed. Under condition 5 of Findings and Order signed June 10, 1994, "The applicant will report each January and July, beginning with January 1995 through January 1999, to the State Engineer, its efforts and success or failure in meeting its proposed water conservation program set forth in Findings 8 and 9." The reporting has not occurred per the Findings and Order.

RETURN FLOW PLAN

The return flow credit used by the State Engineer to determine offsets to effects to the surface flow of the Rio Grande shall be based on a return flow credit of 50% of the combined total amount of water pumped from the three wells for each 12-month period since January 1, 1995.

Under item 21 of Findings and Order signed June 10, 1994, The City of Albuquerque and Intel Corporation entered into a contractual agreement (dated November 29, 1993) whereby the City accepts Intel's excess water into its wastewater treatment facility and discharges that water into the Rio Grande. That Agreement reads in part:

> 'Section 2.4 The City agrees that Intel may retain all water right return flow credits corresponding to that portion of the Intel wastewater discharge attributable by measurement to Intel well production amounts, as subject to verification by Intel to the city and the State Engineer Office of New Mexico, in an amount up to four thousand five hundred (4,500) acre-feet per year.'

The Agreement is subject to termination by either party upon thirty (3) days prior written notice by either party subject to conditions."

According to condition 7 of June 10, 1994 Findings and Order, "The applicant shall submit proof, acceptable to the State Engineer, each January and July, beginning with January 1995 through January 1999 that the return flow credit approved by the State Engineer has been released to the Rio Grande."

According to September 20, 1994 letter from Paul Saavedra, Deputy Chief of Water Rights Division to Charles T. Dumars, Esq., for INTEL, "the State Engineer will accept a return flow of up to 85% (maximum) on a month by month basis, for water diverted from wells RG-57125, RG-57125-S and RG-57125-S-2 only, under the following restrictions and in accordance with Condition No. 11 of the June 10, 1994, Findings and Order of the State Engineer.

1. INTEL shall install and operate measuring devices of a type approved by and installed in a manner acceptable to the State Engineer for measurement of and recording of water diverted from, a) wells No. RG-57125, RG-57125-S and RG-57125-S-2, b) Rio Rancho Utilities Corporation water provided to INTEL, and c) the amount of effluent returned to the City of Albuquerque sewer system.

2. The permittee shall measure or compute the amount of return flow by a method acceptable to the State Engineer; until the method of accounting for water returned to the city of Albuquerque Sewer System has been accepted by the State Engineer the acceptable return flow credit will not exceed 50%."

METER READINGS & RETURN FLOW CREDIT

Table below indicates reported diversion and return flow amounts. The State Engineer will only accept a return flow credit up to 85% for water diverted from wells RG-57125, RG-57125-S, and RG-57125-S-2 even though Intel reported 88% and 89% credits for years 1995 and 1997, respectively.

YEAR	TOTAL DIVERSION	RETURN FLOW CREDIT	RETURN FLOW %
1995	965.10	846.7	88*
1996	3191.0	2,727.1	85
1997	3178.0	2,819.0	89*
1998	3245.2	2,702.8	83.3
1999	3099.9	2,478.2	79.8
2000	3051.4	2,478.3	81.2
2001	2484.9	2,042.9	82.2
2002	2774.9	2,269.3	81.8
2003	2831.0	2,126.6	75.1

STREAM DEPLETIONS

The Glover-Balmer (GB) method was used to compute the stream depletions on the Rio Grande. Approved Return Flows exceed the depletions; therefore, Intel is augmenting the Rio Grande. In approximately year 2013, the return flows will equal the depletions. At that time, Intel will be required to offset the effects to the Rio Grande.

YEAR	DIVERSION	RF (acre-feet)	RF %	GB (acre-feet)	GB-RF (acre-feet)
1995	965.10	820.3	85*	105.15	-715.15
1996	3191.0	2727.1	85	490.58	-2236.52
1997	3178.0	2701.3	85*	913.06	-1788.24
1998	3245.2	2702.8	83.3	1201.69	-1501.11
1999	3099.9	2478.2	79.8	1395.03	-1083.17
2000	3051.4	2478.3	81.2	1524.56	-953.74
2001	2484.9	2042.9	82.2	1563.72	-479.18
2002	2774.9	2269.3	81.8	1595.73	-673.57
2003	2831.0	2126.6	75.1	1660.98	-465.62

WELL MONITORING SYSTEM

Under condition 2 of Findings and Order signed June 10, 1994, applicant was instructed to install a well monitoring system in the Village of Corrales area and monitor subsequent groundwater effects for a period of three years from the first date of diversion of water by permit. "Based on the results of this monitoring, the State Engineer may relieve the applicant of additional monitoring of groundwater effects to shallow wells or place additional conditions on this permit to protect existing shallow wells, as appropriate." According to May 13, 1998 letter from Paul Saavedra, Director of Water Rights, the well monitoring reports are no longer required.

AL: al

RG_57125

TIME and DATE
month: 9 day: 22 year: 2004
hour: 15 minute: 52 second: 50

STREAM DEPLETION CAUSED BY PUMPING MULTIPLE WELLS AT
VARIOUS RATES IN AN INFINITE - STRIP, NON - LEAKY AQUIFER.
THE WELLS ARE BETWEEN THE STREAM AND A PLANE BOUNDARY.

(Glover and Balmer equation)

T = 6684. square ft/day S = .200000

Number of wells = 1

Distance from stream to plane boundary = 13.40 miles

Distances of the wells from the stream and the number of pumping rates

Well #	Distance (miles)	No. of rates
1	1.50	9

PUMPING SCHEDULES FOR THE WELLS

Pumping schedule for well number 1

	Pumping rate		Pumping time	
Q(1) =	965.1	ac-ft/yr for	1.000	years
Q(2) =	3191.0	ac-ft/yr for	1.000	years
Q(3) =	3178.0	ac-ft/yr for	1.000	years
Q(4) =	3245.2	ac-ft/yr for	1.000	years
Q(5) =	3099.9	ac-ft/yr for	1.000	years
Q(6) =	3051.4	ac-ft/yr for	1.000	years
Q(7) =	2484.9	ac-ft/yr for	1.000	years
Q(8) =	2774.9	ac-ft/yr for	1.000	years
Q(9) =	2831.0	ac-ft/yr for	100.000	years

Image Control = .10000000E-06

Time variable (t) Only 500 timesteps allowed

t min = 1.000 years; t max = 100.000 years;
delta t = 1.000 years

Rate of Accumulated Depletion Depletion Volume in

RG_57125

Time (years)	Depletion (ac-ft/yr)	Volume (acre-feet)	Time Period (acre-feet)
1.000	105.149895	33.733914	33.733914
2.000	490.577982	293.001371	259.267456
3.000	913.063383	1009.378648	716.377277
4.000	1201.689595	2074.298779	1064.920131
5.000	1395.030392	3380.990169	1306.691391
6.000	1524.564893	4844.462827	1463.472658
7.000	1563.717806	6401.258934	1556.796107
8.000	1595.733987	7973.671470	1572.412536
9.000	1660.983658	9601.514229	1627.842759
10.000	1720.546859	11293.190503	1691.676275
11.000	1770.665868	13039.458647	1746.268143
12.000	1813.960340	14832.259453	1792.800806
13.000	1852.082604	16665.661479	1833.402026
14.000	1886.091619	18535.056966	1869.395487
15.000	1916.725735	20436.721804	1901.664838
16.000	1944.531786	22367.567104	1930.845300
17.000	1969.931424	24324.984192	1957.417087
18.000	1993.258962	26306.739951	1981.755760
19.000	2014.784921	28310.902119	2004.162167
20.000	2034.731664	30335.783799	2024.881680
21.000	2053.284298	32379.901068	2044.117269
22.000	2070.598552	34441.939861	2062.038793
23.000	2086.806641	36520.729661	2078.789800
24.000	2102.021706	38615.222307	2094.492646
25.000	2116.341259	40724.474711	2109.252404
26.000	2129.849881	42847.634634	2123.159923
27.000	2142.621360	44983.928859	2136.294225
28.000	2154.720417	47132.653298	2148.724439
29.000	2166.204098	49293.164640	2160.511342
30.000	2177.122917	51464.873268	2171.708629
31.000	2187.521794	53647.237213	2182.363944
32.000	2197.440834	55839.756956	2192.519744
33.000	2206.915983	58041.970958	2202.214001
34.000	2215.979568	60253.451770	2211.480812
35.000	2224.660762	62473.802661	2220.350891
36.000	2232.985977	64702.654662	2228.852001
37.000	2240.979195	66939.663973	2237.009312
38.000	2248.662254	69184.509686	2244.845713
39.000	2256.055094	71436.891760	2252.382074
40.000	2263.175972	73696.529237	2259.637477
41.000	2270.041637	75963.158648	2266.629411
42.000	2276.667498	78236.532590	2273.373942
43.000	2283.067757	80516.418456	2279.885866
44.000	2289.255532	82802.597287	2286.178832

45.000	2295.242963	85094.862749	2292.265461
46.000	2301.041306	87393.020194	2298.157445
47.000	2306.661014	89696.885825	2303.865631
48.000	2312.111810	92006.285926	2309.400101
49.000	2317.402754	94321.056168	2314.770242
50.000	2322.542295	96641.040972	2319.984804
51.000	2327.538328	98966.092927	2325.051955
52.000	2332.398237	101296.072259	2329.979332
53.000	2337.128935	103630.846337	2334.774078
54.000	2341.736903	105970.289224	2339.442887
55.000	2346.228219	108314.281262	2343.992039
56.000	2350.608596	110662.708686	2348.427424
57.000	2354.883399	113015.463266	2352.754580
58.000	2359.057678	115372.441980	2356.978713
59.000	2363.136185	117733.546702	2361.104722
60.000	2367.123398	120098.683921	2365.137220
61.000	2371.023536	122467.764475	2369.080554
62.000	2374.840581	124840.703299	2372.938823
63.000	2378.578288	127217.419194	2376.715895
64.000	2382.240203	129597.834613	2380.415419
65.000	2385.829677	131981.875455	2384.040842
66.000	2389.349875	134369.470877	2387.595422
67.000	2392.803791	136760.553113	2391.082236
68.000	2396.194254	139155.057309	2394.504196
69.000	2399.523943	141552.921364	2397.864055
70.000	2402.795392	143954.085783	2401.164419
71.000	2406.011002	146358.493536	2404.407754
72.000	2409.173044	148766.089932	2407.596395
73.000	2412.283672	151176.822488	2410.732556
74.000	2415.344925	153590.640819	2413.818331
75.000	2418.358737	156007.496526	2416.855707
76.000	2421.326941	158427.343092	2419.846566
77.000	2424.251275	160850.135785	2422.792694
78.000	2427.133387	163275.831568	2425.695783
79.000	2429.974842	165704.389008	2428.557439
80.000	2432.777124	168135.768195	2431.379187
81.000	2435.541641	170569.930668	2434.162473
82.000	2438.269732	173006.839336	2436.908668
83.000	2440.962666	175446.458413	2439.619077
84.000	2443.621649	177888.753351	2442.294938
85.000	2446.247827	180333.690777	2444.937425
86.000	2448.842288	182781.238433	2447.547657
87.000	2451.406068	185231.365126	2450.126693
88.000	2453.940150	187684.040671	2452.675544
89.000	2456.445469	190139.235840	2455.195169

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90.000	2458.922914	192596.922318	2457.686478
91.000	2461.373331	195057.072659	2460.150341
92.000	2463.797539	197519.671291	2462.598632
93.000	2466.196307	199984.695776	2465.024485
94.000	2468.570317	202452.080970	2467.385195
95.000	2470.920293	204921.829019	2469.748049
96.000	2473.246894	207393.912871	2472.083852
97.000	2475.550754	209868.313011	2474.400139
98.000	2477.832464	212344.999958	2476.686947
99.000	2480.092615	214823.967590	2478.967632
100.000	2482.331738	217305.182139	2481.214548