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U.S. Army Corps of Engineers Omaha District Monthly Drought Report, September 2006

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U.S. Army Corps of Engineers Omaha District Monthly Drought Report September 2006





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CURRENT CONDITIONS

The drought in the south and on the high plains, including the Missouri River Basin, continues with no immediate, foreseeable relief. There are still large areas of "severe" and "extreme" drought, as indicated by the U.S. Drought Monitor. Also, there are still no areas within the Missouri River Basin exhibiting "normal" long-term moisture conditions.

A good indication of the severity of the drought is reflected in the recent relief measures proposed by Agricultural Secretary Mike Johanns. The relief is aimed at farmers and ranchers who have suffered through another year of drought and are experiencing significant crop and livestock losses.

Precipitation Departures

Precipitation departures from normal during the last 72 months for the United States are shown in Figure 1. In Montana, accumulated precipitation ranges from near normal to nearly a 15-inch deficit. Wyoming's accumulated precipitation varies widely from near normal to a 20-inch deficit. Nebraska ranges from near normal to a 15-inch deficit. The Dakotas generally range from near normal to a 30-inch deficit. The South Platte River Basin in Colorado still shows precipitation deficits of 5 to 15 inches during a majority of the 72-month period.

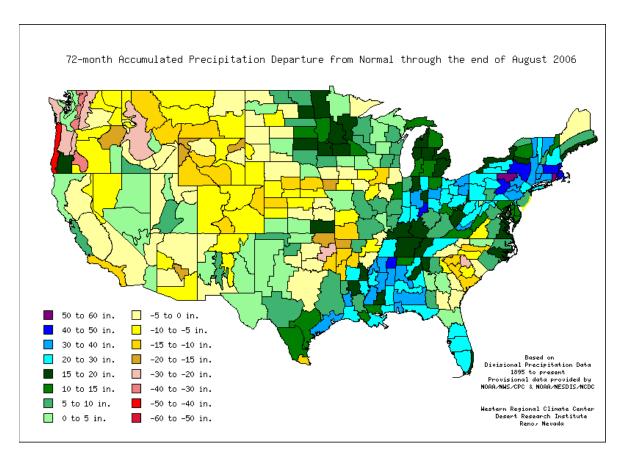
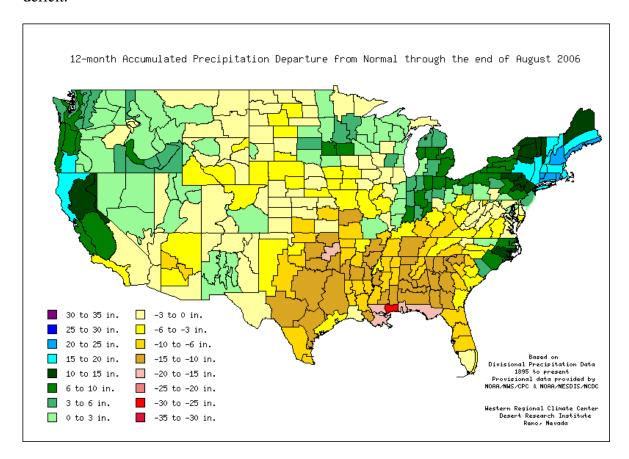


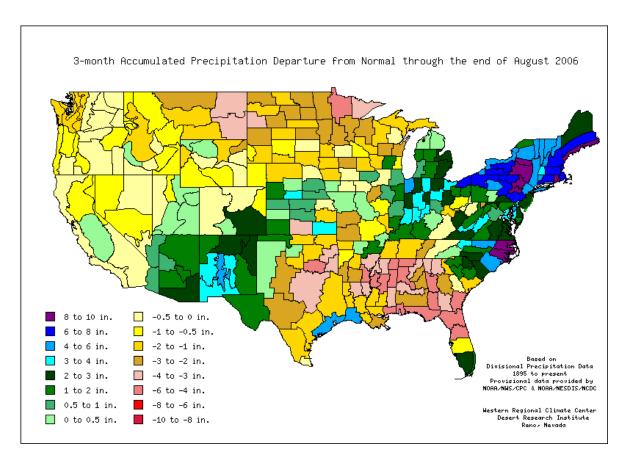
Figure 1 – 72 month Precipitation Departure From Normal http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep72

The 12-month precipitation accumulation in Figure 2 indicates that precipitation throughout much of the western and northwestern District is from normal to a six-inch deficit.



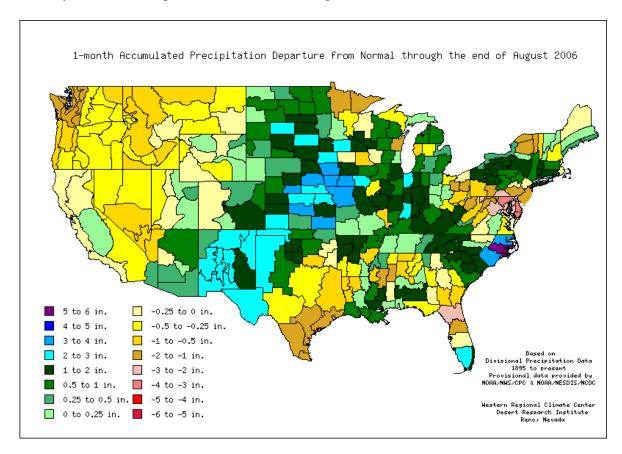
 $Figure~2-12~month~Precipitation~Departure~From~Normal\\ \underline{http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep12}$

The three-month period (Figure 3) shows deficits up to six-inches within the basin.



 $Figure \ 3-3 \ month \ Precipitation \ Departure \ From \ Normal \ \underline{http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep03}$

A large portion of the basin received favorable precipitation in August. Some areas actually received a surplus of several inches (Figure 4).



 $Figure~4-1~month~Precipitation~Departure~From~Normal\\ \underline{http://www.wrcc.dri.edu/cgi-bin/spiFmap.pl?dep01}$

Drought Indicators

The Palmer Drought Severity Index and the Drought Monitor are two commonly used drought-indicator products that convey both short-term and long-term drought conditions and impacts. Both the Palmer Index and Drought Monitor depict some regions exhibiting varying degrees of drought in Nebraska, South Dakota, Wyoming, and Montana, which have been suffering from drought since 2000.

Palmer Drought Severity Index

The Palmer Drought Severity Index (PDSI) is a meteorological drought index that monitors the hydrologic water balance including the basic terms such as precipitation, evapotranspiration, soil recharge, runoff, and moisture loss. The purpose of this index is to provide standardized measurements of the moisture balance in a region without taking into account streamflow, lake and reservoir levels, and other hydrologic impacts. PDSI is a multi-month drought index; therefore, it responds well and is more suitable for short-term droughts.

Changes to the PDSI are more immediate in response to heavy precipitation over short periods. The PDSI shown in Figure 5 reflects near normal to extreme drought conditions across the Omaha District. The near normal areas are indicative of the rains received in eastern Nebraska and eastern South Dakota.

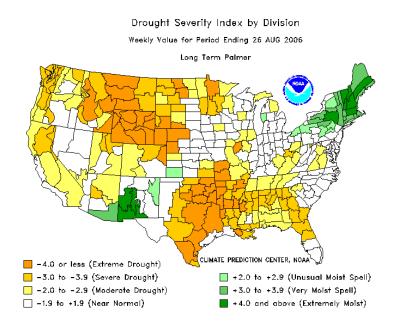
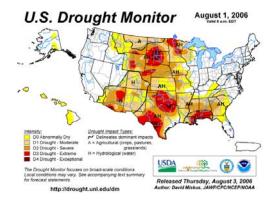


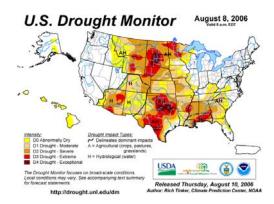
Figure 5 – Long-Term Palmer Drought Indicator Ending 26 AUG 2006 http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

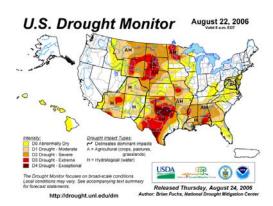
Drought Monitor

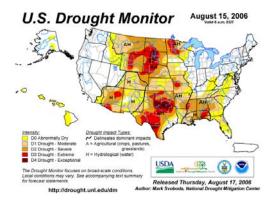
The Drought Monitor is a multi-agency comprehensive drought classification scheme updated weekly by the National Drought Mitigation Center. The Drought Monitor combines information from the Palmer Drought Index, the Climate Prediction Center's soil moisture model, USGS weekly streamflow percentiles, the standard precipitation index, the crop moisture index, and during the snow season basin snow water content, basin average precipitation, and the surface water supply index. Since this product considers streamflow conditions and reservoir water supply, and it allows manual adjustment; it is a good depiction of long-term drought impacts to the affected areas. The Drought Monitor uses four levels of drought classification (moderate, severe, extreme, and exceptional), and it notes the type of impact caused by the drought (agricultural and hydrologic).

Similar to July, the basin has large areas suffering from "severe" to "exceptional" drought conditions. The figures below illustrate the extent and severity of the drought.









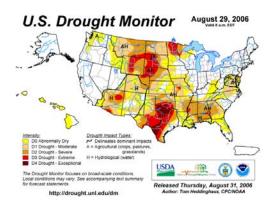


Figure 6 – U.S. Drought Monitor – August 1, 2006 through August 29, 2006 http://www.drought.unl.edu/dm/monitor.html

DROUGHT OUTLOOK

The basin drought outlook uses several expert products that indicate precipitation needs necessary to reduce the Palmer Drought to normal conditions, a one- and three-month climate outlook, and the impacts that future climate predictions could have on the current drought situation. The three-month Drought Outlook (Figure 7) indicates that large portions of the effected area could show improvement.

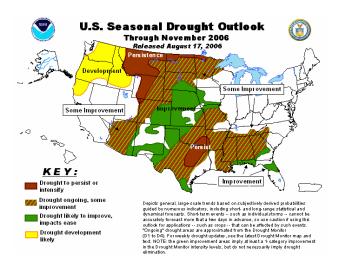


Figure 7 – Three-Month Seasonal Drought Outlook through November 2006 http://www.cpc.ncep.noaa.gov/products/expert_assessment/seasonal_drought.html

Weekly Precipitation Need

6 to 9 Inches

Figure 8 is the weekly precipitation needed to reduce the current Palmer Drought Severity Index value to -0.5 or near normal conditions.

Additional Precip. Needed (In.) to Bring PDI to -0.5

Weekly Value for Period Ending 2 SEP 2006

Long Term Palmer Drought Severity Index (PDI)

CLIMATE PREDICTION CENTER, NOAA

Trace to 3 Inches

9 to 12 Inches

12 to 15 Inches

Figure 8 – Weekly Precipitation Need to Bring PDI to -0.5 http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/addpcp.gif

Over 15 Inches

In order to reach near normal Palmer Drought conditions, Montana would need from 3 to 9 inches of precipitation across the state, the North Platte River basin in Wyoming would require up to 3 to 12 inches of precipitation while Nebraska would require up to 6 inches. Water supply deficits in large reservoirs, groundwater reserves, and possibly subsoil moisture reserves would receive limited benefit from the weekly Palmer precipitation needs. Mitigation of a multi-year drought would likely require multiple years of normal and above-normal water inflow conditions.

Mainstem Reservoir Information

The mainstem reservoir system conditions continued to deteriorate throughout August. The Ft. Peck reservoir is higher than at this time last year, however, it is beginning to fall. The Oahe reservoir experienced a new record low and the Garrison reservoir has begun its decline. The level of the Oahe reservoir will be closely monitored and coordinated with Garrison releases to make sure that no adverse impacts are realized at any Oahe reservoir municipal water intakes. Based on the current reservoir conditions and the latest predictions from Northwestern Division Water Management Division, no municipal water intakes within the reservoirs appear to be in jeopardy.

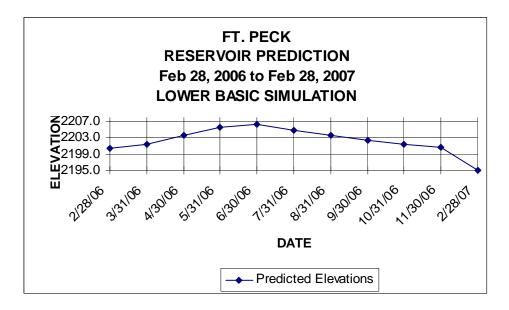
Fort Peck, Montana

Reservoir Elevation Overview

| | | 30-Day | 150-Day |
|----------------|--------------|-------------|--------------|
| | Current Lake | Projected | Projected |
| Lake Elevation | Elevation | Elevation* | Elevation* |
| 8/31/2005 | 8/31/2006 | (9/30/2006) | (01/31/2007) |
| (ft. msl) | (ft. msl) | (ft. msl) | (ft. msl) |
| 2202.3 | 2203.5 | 2202.3 | 2196.5 |

Comments:

- 1. Current reservoir elevation is 30.5-feet below the top of conservation pool (elevation 2234.0 ft. msl).
- 2. Projections provided are based upon the Lower Basic Simulation prepared by the Reservoir Control Center.
- 3. Current elevation is 1.2-ft. higher than elevation on 7/31/05 (2203.2).
- * Normally use 180-day projections; however, since the water year ends Jan. 31, the end of water year projection is used.



Water Intake Overview

| Intake | Comments | | | |
|-----------------------|----------------------------|--|--|--|
| | No issues. | | | |
| Hell Creek State Park | Well completed 22 NOV 2004 | | | |

Access Overview

- 1. 8 ramps usable (Corps and State); 3 ramps unusable. No permanent ramps operational.
- 2. Remaining concessionaires marginal.

Noxious Weeds Overview

- 1. As the reservoir elevation dropped, the noxious weeds spread along the shoreline.
- 2. Main concern is Saltcedar, which thrives along the shoreline as the reservoir elevation declines.
- 3. Noxious weed control is being addressed.

Cultural Resources Overview

1. No issues to date.

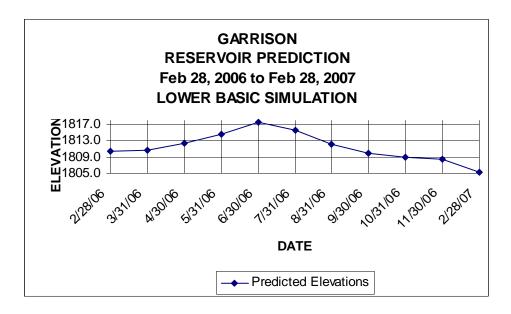
Garrison, North Dakota

Reservoir Elevation Overview

| | | 30-Day | 150-Day |
|----------------|--------------|-------------|-------------|
| | Current Lake | Projected | Projected |
| Lake Elevation | Elevation | Elevation | Elevation* |
| 8/31/2005 | (8/31/2006) | (9/30/2006) | (1/31/2007) |
| (ft. msl) | (ft. msl) | (ft. msl) | (ft. msl) |
| 1816.5 | 1812.0 | 1809.8 | 1806.0 |

Comments:

- 1. Current reservoir elevation is 25.5-feet below the top of conservation pool (elevation 1837.5 ft. msl).
- 2. Projections provided are based upon the Lower Basic Simulation prepared by the Reservoir Control Center.
- 3. Current reservoir elevation is 4.5 ft. lower than elevation on 8/31/05 (1816.5).
- * Normally use 180-day projections; however, since the water year ends Jan. 31, the end of water year projection is used.



Water Intake Overview

| | | Current Reservoir | Top of Screen | Operational Concern | Shutdo Elev | | Population | Contingency Plan? | Resp. |
|-------------|-------------|----------------------|------------------|------------------------|----------------|--------|------------|----------------------|---------|
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Whiteshield | Operational | 1816.5 | 1787 | 1805 | 1787 | 1792 | 720 | N | TAT/BOR |

Comments:

1. Top of Screen Elevation taken from survey completed by the Corps in 2005. The intake was extended and lowered 2-feet since the Corps' survey in 2005.

Future Plans:

- 1. Ft. Berthold Rural Water System (FBRW) secured \$1.0 million funding through USDA Emergency Community Water Assistance Grant Program for improvements in 2006.
- 2. Project design includes a 940-feet bored pipeline into the lake at elevation 1763. The line will be 24" polyethylene pipe. New SCADA control and pumps are included in the project design.
- 3. FBRW has the option of discontinuing existing system or keeping the system in operation as a backup.
- 4. Project bids were opened 19 JUL 2006. The low bid was \$318,000 over the project estimate. FBRW is negotiating with the low bidder in an attempt to lower the project costs. If negotiations are successful, project construction will begin in September 2006 and will be completed by the Fall of 2007.

| | | Current Reservoir | Top of | Operational Concern | Shutde Ele | | Population | Contingency | Resp. |
|-------------|-------------|----------------------|-----------------|------------------------|---------------|--------|------------|----------------|---------|
| Intake | Status | Elev. | Screen Elev. | Elev. | Summer | Winter | Supported | Plan? (Y/N) | Agency |
| Twin Buttes | Operational | 1816.5 | 1784.4 | 1805 | 1788 | 1790 | 425 | N | TAT/BOR |

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. Erosion due to low reservoir levels have caused increased sediment in the intake piping. This has increased maintenance cost to remove the sediment and increased the cost of treating the water.

Future Plans:

- 1. Ft. Berthold Rural Water System has secured funding through the Indian Health Services, the Bureau of Reclamation, and the USDA Emergency Community Water Assistance Grant Program to improve the system in 2006.
- 2. Project design includes a 760-feet bored pipeline into the lake at elevation 1741. The line will be a 24" polyethylene pipe. New SCADA control and pumps are included in the design.
- 3. FBRW has the option of discontinuing existing system or keeping the system in operation as a backup.
- 4. Project bids were opened 19 JUL 2006. The low bid was \$209,000 over the project estimate. FBRW is negotiating with the low bidder in an attempt to lower the project costs. If negotiations are successful, project construction will begin in September 2006 and will be completed by the Fall of 2007.

| | | Current | Top of | Operational | Shutde Ele | | | Contingency | _ |
|----------|-------------|-----------|--------|-------------|---------------|--------|------------|-------------|---------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Mandaree | Operational | 1816.5 | 1786 | 1789.0 | 1789 | 1794 | 780 | N | TAT/BOR |

Comments:

- 1. The new intake screen is at elevation 1786.
- 2. Grant monies for the project were secured from USDA Emergency Community Water Assistance Grant Program and Indian Health Services and work on the intake was completed in 2005.

| | | Current | Top of | Operational | Shutde Ele | | | Contingency | |
|------------|-------------|-----------|--------|-------------|---------------|--------|------------|-------------|---------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Four Bears | Operational | 1816.5 | 1789.9 | 1800.0 | 1792 | 1794 | 900 | N | TAT/BOR |

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. The screen has been checked by divers and it was confirmed that approximately 20-feet of water is over the intake.
- 3. Erosion due to low reservoir levels have caused increased sediment in the intake piping. This has increased maintenance cost to remove the sediment and increased the cost of treating the water.

Future Plans:

- 1. Ft. Berthold Rural Water System has secured funding through USDA Emergency Community Water Assistance Grant Program to improve the intake in 2006.
- 2. The project design includes 1,160-feet of 24-inch polyethylene pipe bored into the reservoir at elevation 1741. The design includes SCADA control and new pumps.
- 3. FBRW has the option of discontinuing existing system or keeping the system in operation as a backup.
- 4. Project bids were opened 19 JUL 2006. The low bid was \$180,000 over the project estimate. FBRW is negotiating with the low bidder in an attempt to lower the project costs. If negotiations are successful, project construction will begin in September 2006 and will be completed by the Fall of 2007.

| | | Current | Top of | Operational | Shutde Ele | | | Contingency | |
|----------|----------|-----------|---------|-------------|---------------|--------|------------|-------------|----------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Parshall | Operable | 1816.5 | 1803.6* | 1806.6 | 1797.5 | 1801.5 | 1000 | N | Parshall |

Comments:

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. The City had a telescoping riser attached to the intake by 30 July 2005. The riser extended the intake to within 3- to 4-feet of the water's surface.
- 3. Require at least 3 feet of water over the intake for proper operation.
- 4. Water quality at current level is good following water treatment.

Future Plans:

1. Discussions have been held between Parshall and New Town regarding future water supply. No formal decisions have been reached. Parshall is a proposed supplier for the Rural Water System.

^{*}Screen is raised or lowered according to reservoir elevations.

| | | | | | Shutdown | | | | |
|-----------|-------------|-----------|--------|-------------|----------|--------|------------|-------------|-----------|
| | | Current | Top of | Operational | Ele | v. | | Contingency | |
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Pick City | Operational | 1816.5 | 1795 | 1800 | 1798 | 1800 | 200 | | Pick City |

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. At least 5-feet of water is necessary to operate this intake. If continued usage is planned, the intake will have to be lowered.

Future Plans:

1. Rural water is available to the City, however, they have chosen to continue using their intake until the water no longer meets State Health Standards or work is required on their intake.

| | | Current | Top of | Operational | Shutde Ele | | | Contingency | |
|----------|-------------|-----------|--------|-------------|---------------|--------|------------|-------------|----------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Garrison | Operational | 1816.5 | 1787.2 | 1805 | 1792 | 1792 | 1830 | N | Garrison |

Comments:

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. A regulatory permit was currently issued for the reinstallation of existing 950-feet of 8" poly pipe and installation of new 250-feet of 8" poly pipe to extend the intake system.

| | | Current | Top of | Operational | Shutd Ele | | D. v. 1.4 v. | Contingency | D |
|-------------|-------------|-----------|--------|-------------|--------------|--------|--------------|-------------|-------------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| SW Pipeline | Operational | 1816.5 | 1779.0 | 1782 | 1776 | | 34,000 | N | SW Pipeline |

Comments:

1. This system provides water for the City of Dickinson, Antelope Valley Power Plant, Coal Gasification Plant, and the Southwest Water Authority.

Access Overview

1. Ft. Stevenson State Park Marina design is completed. However, no federal funding is available for construction.

Updated 9/5/2006 Reservoir Elevation 8/31/06 – 1816.5

| Location | Туре | Top Elevation | Bottom Elevation | Comments | Managing Agency | Contact Person | Phone |
|---|-------------------------------|------------------|---------------------|----------|-------------------------------|--------------------|----------|
| Beaver Bay (low-water-COE) | poured concrete | 1829 | 1808 | Usable | Corps of Engineers | Linda Phelps | 654-7411 |
| Beulah Bay | poured concrete | 1852.4 | 1799 | Usable | Beulah Park Board | Bev Sullivan | 870-5852 |
| Camp of the Cross | Slide-in metal sections | 1819 | 1806 | Usable | Lutheran Bible Camp | Larry Crowder | 337-2246 |
| Charging Eagle Bay (1st low water) | poured concrete | 1829.2 | 1810.6 | Unusable | Three Affiliated Tribes | Jim Mossett | 880-1203 |
| Dakota Waters Resort (low-water) | poured concrete, planks | 1853.4 | 1797 | Usable | Beulah Park Board | Kelvin Heinsen | 873-5800 |
| Deepwater Creek (2nd low water) | concrete planks & metal | 1820 | 1808 | Usable | Corps of Engineers | Linda Phelps | 654-7411 |
| Deepwater Creek (1st low water) | poured concrete | 1838.5 | 1809 | Unusable | Corps of Engineers | Linda Phelps | 654-7411 |
| Douglas Creek (low water) | poured concrete, planks | 1831 | 1801 | Usable | Corps of Engineers | Linda Phelps | 654-7411 |
| Fort Stevenson State Park (low water) | poured concrete | 1821.8 | 1790 | Usable | ND Parks & Rec | Dick Messerly | 337-5576 |
| Four Bears Park (south low water) | concrete planks | 1820.7 | 1803 | Usable | Three Affiliated Tribes | Alan Chase | 627-4018 |
| Garrison Creek Cabin Site | poured concrete | 1857 | 1802 | Usable | Garrison Cabin Assc. | Percy Radke | 337-2247 |
| Government Bay (low water) | slide-in metal sections | 1815 | 1803 | Unusable | Corps of Engineers | Linda Phelps | 654-7411 |
| Government Bay (main ramp) | poured concrete | 1857 | 1810 | Unusable | Corps of Engineers | Linda Phelps | 654-7411 |
| Hazen Bay (2nd low water) | poured concrete | 1830.6 | 1808 | Usable | Hazen Park Board | Jeff Gustafson` | 748-6948 |
| Indian Hills (2nd low water) | concrete planks | 1817.6 | 1807 | Usable | Parks & Rec/Tribes | Kelly Sorge | 743-4122 |
| Indian Hills (1st low water) | concrete planks | 1826.4 | 1811.8 | Usable | Parks & Rec/Tribes | Kelly Sorge | 743-4122 |
| McKenzie Bay (east ramp) | poured concrete | 1850.9 | 1796 | Usable | McKenzie Marine Club | Rhonda Logan | 579-3366 |

| Location | Туре | Top Elevation | Bottom Elevation | Comments | Managing Agency | Contact Person | Phone |
|--|----------------------------------|------------------|---------------------|----------|-----------------------------------|-------------------|----------|
| Parshall Bay (2nd low-water) | poured concrete | 1817.8 | 1808.5 | Usable | Mountrail County Park Board | Clarence Weltz | 627-3377 |
| Pouch Point (3rd low-water) | slide-in metal sections | 1819 | 1809 | Unusable | Three Affiliated Tribes | Paul Danks | 627-3627 |
| Pouch Point (2nd low-water) | poured concrete | 1834.8 | 1813 | Unusable | Three Affiliated Tribes | Paul Danks | 627-3627 |
| Reunion Bay (2nd low water) | concrete planks | 1826.6 | 1808 | Usable | Corps of Engineers | Linda Phelps | 654-7411 |
| Sakakawea State Park (main) | poured concrete | 1850 | 1800 | Usable | ND Parks & Rec | John Tunge | 487-3315 |
| Sanish Bay (Aftem) (low water) | poured concrete | 1830.8 | 1807.4 | Unusable | Aftem Lake Development | Gerald Aftem | 852-2779 |
| Skunk Creek Recreation Area (main) | poured concrete | 1840 | 1806.5 | Usable | Three Affiliated Tribes | Ken Danks | 290-2841 |
| Sportsmen's Centennial Park | poured concrete | 1831.6 | 1808.5 | Usable | McLean County | Les Korgel | 462-8541 |
| Steinke Bay | poured concrete | 1833.1 | 1813.4 | Unusable | North Dakota Game & Fish | Bob Frohlich | 328-6346 |
| Van Hook (Gull Island north low- water) | metal bridge deck sections | 1817.8 | 1805 | Usable | Mountrail County Park Board | Clarence Weltz | 627-3377 |
| Van Hook (west low water ramps) | poured concrete | 1821.2 | 1808 | Usable | Mountrail County Park Board | Clarence Weltz | 627-3377 |
| White Earth Bay (main) | poured concrete | 1850.9 | 1801 | Usable | Mountrail County Park Board | Greg Gunderson | 755-3277 |
| Wolf Creek Recreation Area (1st low water) | poured concrete | 1833.8 | 1802.5 | Usable | Corps of Engineers | Linda Phelps | 654-7411 |

Noxious Weeds Overview

1. Project personnel are continuing efforts to combat noxious weeds.

Cultural Resources Overview

1. Project personnel continue to monitor the shoreline for the protection of cultural resources.

Other Areas of Interest/Concern

- 1. Garrison National Fish Hatchery Three issues exist and are of concern to the State of North Dakota and the U.S. Fish and Wildlife Service.
 - a. Addition of a fifth boiler and necessary power for operation.
 - b. Ability to fill 40 rearing ponds.
 - c. Adequacy of the existing 20-inch water supply line from the penstocks.
- 2. Fact sheets for the hatchery issues exist. OP-TM is investigating a design for additional power requirements to the hatchery. An MOU may need to be set up to address future operating needs and requirements.
- 3. Garrison Cold Water Fishery The modification to the trashracks of intakes 2 and 3, was completed 22 July 2005. The modifications were kept in place throughout the winter period, as the cost to remove and replace was comparable to lost power generation costs. The plates will be inspected in the spring with an underwater camera to ensure structural adequacy.

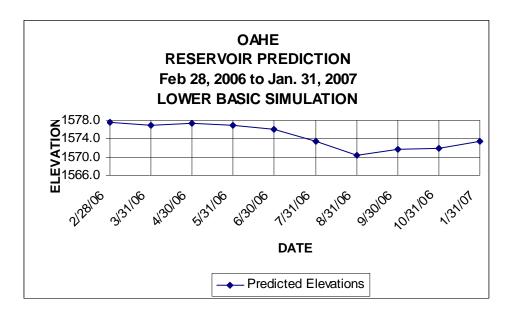
Oahe, South Dakota

Reservoir Elevation Overview

| | | 30-Day | 150-Day |
|----------------|--------------|-------------|-------------|
| | Current Lake | Projected | Projected |
| Lake Elevation | Elevation | Elevation | Elevation* |
| 8/31/2005 | (8/31/2006) | (9/30/2006) | (1/31/2007) |
| (ft. msl) | (ft. msl) | (ft. msl) | (ft. msl) |
| 1573.9 | 1570.4 | 1572.9 | 1573.8 |

Comments:

- 1. Current reservoir elevation is 37.1-feet below the top of conservation pool (elevation 1607.5 ft. msl).
- 2. Projections provided are based upon the Lower Basic Simulation prepared by the Reservoir Control Center.
- 3. Current reservoir elevation is 3.5 feet lower than 8/31/05 (1573.9).
- * Normally use 180-day projections; however, since the water year ends Jan. 31, the end of water year projection is used.



Water Intake Overview

| | | Current | Top of | Operational | Shutde Ele | | | Contingency | |
|-----------|-------------|-----------|--------|-------------|---------------|---------|------------|-------------|----------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Ft. Yates | Operational | | 1571.2 | 1573 | 1572.2* | 1575.2* | 3,400 | Y | SRST/BOR |

Comments:

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. A backup well has been drilled and tested.
- 3. New well and plumbing is installed at Fort Yates and can be used as a backup water source.

Future Plans:

- 1. The intake at Fort Yates remains in a river condition and may continue to have sedimentation problems as long as Oahe remains below elevation 1580. Sediment levels in the sump are measured weekly and the river channel is monitored.
- 2. Contingency plans are in place and have been exercised.

| | | | | | Shutde | own | | | |
|---------|-------------|-----------|--------|-------------|--------|--------|------------|-------------|----------|
| | | Current | Top of | Operational | Ele | v. | | Contingency | |
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Wakpala | Operational | | 1563 | 1563 | 1566 | 1569 | >500 | N | SRST/BOR |

Comments:

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005, a new low profile screen was installed lowering the top of the screen elevation to 1563.
- 2. Contingency plans are being drafted to respond to an intake failure. Initial response to an intake failure at Wakpala would be hauling water from the city of Mobridge to the treatment plant to be distributed using the existing transmission lines.

25

^{*}Intake is in riverine conditions and flow to the intake may be influenced by releases from Garrison reservoir.

| | | Current | Top of | Operational | Shutd Ele | | | Contingency | |
|-----------|-------------|-----------|--------|-------------|--------------|--------|------------|-------------|--------|
| | | Reservoir | Screen | Concern | | | Population | Plan? | Resp. |
| Intake | Status | Elev. | Elev. | Elev. | Summer | Winter | Supported | (Y/N) | Agency |
| Mni Wasté | Operational | | 1555.7 | 1580 | 1561.9 | 1560.4 | 14,000 | Y(DRAFT) | CRST |

- 1. Top of Screen Elevation taken from survey completed by the Corps in 2005.
- 2. Construction of a temporary intake approximately 16 miles from the existing intake is underway and is proceeding well. The construction project is a collaborative effort between the Tribe, the State, the Corps and many other entities.
- 3. Trigger Points for continuation of construction are being closely monitored.

Access Overview

- 1. The State of South Dakota is responsible for maintaining recreational areas and access to the reservoir in South Dakota. The Oahe Project maintains the access in North Dakota.
- 2. Ramps on Oahe Project in North Dakota:

| AREA | Status |
|----------------------|----------|
| Sibley Park | Usable |
| Little Heart Bottoms | Usable |
| Kimball (Desert) | Usable |
| Graner's Bottoms | Usable |
| Maclean Bottoms | Usable |
| Hazelton | Usable |
| Ft. Rice | Usable |
| North Beaver Bay | Usable |
| Walker Bottoms | Usable |
| Jennerville (Rivery) | Usable |
| Fort Yates | Unusable |
| Cattail Bay | Unusable |
| Langeliers Bay | Unusable |
| Beaver Creek | Unusable |
| State Line | Unusable |

http://gf.nd.gov/fishing/mo-riv-system-boatramps-status.html.

Noxious Weeds Overview

1. The Oahe Project has a \$325,000 budget for salt cedar and other noxious weed control for FY 06.

Cultural Resources Overview

1. Project personnel continue to monitor the shoreline for the protection of cultural resources. As the reservoir elevation falls, more opportunities are uncovered for looters, which collect artifacts and sell them on the open market.

Other

1. The Oahe Project Manager met with County Commissioners at Pollack to discuss constructing a firebreak between the reservoir and the park. Project personnel will investigate constructing a firebreak. This will require working with/coordinating with the State of South Dakota, the current landowner of the proposed construction site.

Mainstem Reservoir Information, Weekly Elevation Comparison

| 7 Aug 2006 | Project Information | | Rese | rvoir Elevati | ion | Reservoir Storage | | | |
|------------------|---------------------|---------------|-----------|---------------|--------|-------------------|-----------|----------|--|
| | | | | | | Current | Previous | | |
| | | | Current | Previous | | Storage | Storage | | |
| | Multi-Purpose | Flood Control | Elevation | Elevation | | (MAC-FT) | (MAC-FT) | Change | |
| Project | Pool Elev. | Pool Elev. | (8/7/06) | (7/31/06) | Change | (8/7/06) | (7/31/06) | (MAC-FT) | |
| Ft. Peck, MT | 2160 - 2246 | 2246 - 2250 | 2204.6 | 2205.0 | -0.4 | 9.705 | 9.757 | -0.052 | |
| Garrison, ND | 1775 – 1850 | 1850 - 1854 | 1814.8 | 1815.6 | -0.8 | 12.019 | 12.196 | -0.177 | |
| Oahe, SD | 1540 - 1617 | 1617 – 1620 | 1572.6 | 1573.4 | -0.8 | 10.248 | 10.413 | -0.165 | |
| Big Bend, SD | 1415 – 1422 | 1422 – 1423 | 1421.0 | 1420.5 | 0.5 | 1.688 | 1.650 | 0.038 | |
| Ft. Randall, SD | 1320 – 1365 | 1365 – 1375 | 1352.8 | 1353.9 | -1.1 | 3.348 | 3.439 | -0.091 | |
| Gavins Point, SD | 1204.5 - 1208 | 1208 - 1210 | 1206.1 | 1205.2 | 0.9 | 0.362 | 0.337 | 0.025 | |

| 14 Aug 2006 | Project Information | | Rese | rvoir Elevati | on | Reservoir Storage | | |
|------------------|---------------------|---------------|-----------|---------------|--------|-------------------|----------|----------|
| | | | | | | Current | Previous | |
| | | | Current | Previous | | Storage | Storage | |
| | Multi-Purpose | Flood Control | Elevation | Elevation | | (MAC-FT) | (MAC-FT) | Change |
| Project | Pool Elev. | Pool Elev. | (8/14/06) | (8/7/06) | Change | (8/14/06) | (8/7/06) | (MAC-FT) |
| Ft. Peck, MT | 2160 - 2246 | 2246 - 2250 | 2204.3 | 2204.6 | -0.3 | 9.657 | 9.705 | -0.048 |
| Garrison, ND | 1775 – 1850 | 1850 – 1854 | 1814.2 | 1814.8 | -0.6 | 11.845 | 12.019 | -0.174 |
| Oahe, SD | 1540 - 1617 | 1617 – 1620 | 1571.9 | 1572.6 | -0.7 | 10.084 | 10.248 | -0.164 |
| Big Bend, SD | 1415 – 1422 | 1422 – 1423 | 1420.3 | 1421.0 | -0.7 | 1.640 | 1.688 | -0.048 |
| Ft. Randall, SD | 1320 – 1365 | 1365 – 1375 | 1353.3 | 1352.8 | 0.5 | 3.388 | 3.348 | 0.040 |
| Gavins Point, SD | 1204.5 - 1208 | 1208 - 1210 | 1207.1 | 1206.1 | 1.0 | 0.387 | 0.362 | 0.025 |

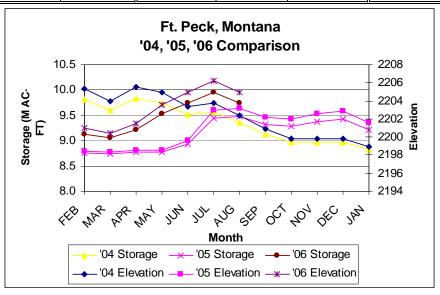
| 21 Aug 2006 | Project Information | | Resei | rvoir Elevatio | on | Reservoir Storage | | | |
|------------------|---------------------|---------------|-----------|----------------|--------|-------------------|-----------|----------|--|
| | | | | | | Current | Previous | | |
| | | | Current | Previous | | Storage | Storage | | |
| | Multi-Purpose | Flood Control | Elevation | Elevation | | (MAC-FT) | (MAC-FT) | Change | |
| Project | Pool Elev. | Pool Elev. | (8/21/06) | (8/14/06) | Change | (8/21/06) | (8/14/06) | (MAC-FT) | |
| Ft. Peck, MT | 2160 - 2246 | 2246 – 2250 | 2204.0 | 2204.3 | -0.3 | 9.600 | 9.657 | -0.057 | |
| Garrison, ND | 1775 – 1850 | 1850 – 1854 | 1813.4 | 1814.2 | -0.8 | 11.685 | 11.845 | -0.160 | |
| Oahe, SD | 1540 - 1617 | 1617 – 1620 | 1571.3 | 1571.9 | -0.6 | 9.975 | 10.084 | -0.109 | |
| Big Bend, SD | 1415 – 1422 | 1422 – 1423 | 1421.3 | 1420.3 | 1.0 | 1.710 | 1.640 | 0.070 | |
| Ft. Randall, SD | 1320 – 1365 | 1365 – 1375 | 1352.4 | 1353.3 | -0.9 | 3.343 | 3.388 | -0.045 | |
| Gavins Point, SD | 1204.5 - 1208 | 1208 - 1210 | 1207.6 | 1207.1 | 0.5 | 0.399 | 0.387 | 0.012 | |

| 28 Aug 2006 | Project Information | | Resei | rvoir Elevatio | on | Reservoir Storage | | |
|------------------|---------------------|---------------|-----------|----------------|--------|-------------------|-----------|----------|
| | | | | | | Current | Previous | |
| | | | Current | Previous | | Storage | Storage | |
| | Multi-Purpose | Flood Control | Elevation | Elevation | | (MAC-FT) | (MAC-FT) | Change |
| Project | Pool Elev. | Pool Elev. | (8/28/06) | (8/21/06) | Change | (8/28/06) | (8/21/06) | (MAC-FT) |
| Ft. Peck, MT | 2160 - 2246 | 2246 - 2250 | 2203.6 | 2204.0 | -0.4 | 9.547 | 9.600 | -0.053 |
| Garrison, ND | 1775 – 1850 | 1850 - 1854 | 1812.6 | 1813.4 | -0.8 | 11.506 | 11.685 | -0.179 |
| Oahe, SD | 1540 - 1617 | 1617 – 1620 | 1570.4 | 1571.3 | -0.9 | 9.842 | 9.975 | -0.133 |
| Big Bend, SD | 1415 – 1422 | 1422 - 1423 | 1421.0 | 1421.3 | -0.3 | 1.697 | 1.710 | -0.013 |
| Ft. Randall, SD | 1320 – 1365 | 1365 – 1375 | 1353.4 | 1352.4 | 1.0 | 3.391 | 3.343 | 0.048 |
| Gavins Point, SD | 1204.5 - 1208 | 1208 - 1210 | 1207.7 | 1207.6 | 0.1 | 0.402 | 0.399 | 0.003 |

Mainstem Reservoir Storage Comparison - Water Years 2004, 2005, 2006

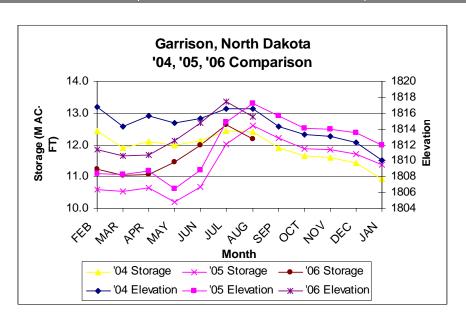
Fort Peck, Montana

| | ater Year 200 2004 – JAN 2 | | | ater Year 20 2005 – JAN | | | ater Year 20 2006 – JAN | |
|-----------|-------------------------------|----------------------|-----------|----------------------------|----------------------|-----------|----------------------------|----------------------|
| Date | Elevation | Storage (MAC-Ft.) | Date | Elevation | Storage (MAC-Ft.) | Date | Elevation | Storage (MAC-Ft.) |
| 2/1/2004 | 2205.3 | 9.806 | 2/1/2005 | 2198.4 | 8.749 | 2/1/2006 | 2201.0 | 9.134 |
| 3/1/2004 | 2204 | 9.603 | 3/1/2005 | 2198.3 | 8.732 | 3/1/2006 | 2200.4 | 9.048 |
| 4/1/2004 | 2205.5 | 9.837 | 4/1/2005 | 2198.5 | 8.773 | 4/1/2006 | 2201.5 | 9.222 |
| 5/1/2004 | 2204.9 | 9.740 | 5/1/2005 | 2198.5 | 8.773 | 5/1/2006 | 2203.6 | 9.540 |
| 6/1/2004 | 2203.4 | 9.507 | 6/1/2005 | 2199.6 | 8.935 | 6/1/2006 | 2204.9 | 9.741 |
| 7/1/2004 | 2203.8 | 9.565 | 7/1/2005 | 2203.0 | 9.448 | 7/1/2006 | 2206.2 | 9.958 |
| 8/1/2004 | 2202.4 | 9.357 | 8/1/2005 | 2203.2 | 9.472 | 8/1/2006 | 2204.9 | 9.750 |
| 9/1/2004 | 2200.9 | 9.121 | 9/1/2005 | 2202.2 | 9.325 | 9/1/2006 | | |
| 10/1/2004 | 2199.8 | 8.969 | 10/1/2005 | 2202.0 | 9.286 | 10/1/2006 | | |
| 11/1/2004 | 2199.8 | 8.963 | 11/1/2005 | 2202.6 | 9.371 | 11/1/2006 | | |
| 12/1/2004 | 2199.8 | 8.961 | 12/1/2005 | 2202.9 | 9.432 | 12/1/2006 | | |
| 1/1/2005 | 2198.9 | 8.829 | 1/1/2006 | 2201.5 | 9.222 | 1/1/2007 | | |



Garrison, ND

| Water Year 2004 (FEB 2004 – JAN 2005) | | | Water Year 2005 (FEB 2005 – JAN 2006) | | | Water Year 2006 (FEB 2006 – JAN 2007) | | |
|--|-----------|----------------------|--|-----------|----------------------|--|-----------|----------------------|
| Date | Elevation | Storage (MAC-Ft.) | Date | Elevation | Storage (MAC-Ft.) | Date | Elevation | Storage (MAC-Ft.) |
| 2/1/2004 | 1816.7 | 12.446 | 2/1/2005 | 1808.4 | 10.574 | 2/1/2006 | 1811.4 | 11.230 |
| 3/1/2004 | 1814.3 | 11.891 | 3/1/2005 | 1808.2 | 10.537 | 3/1/2006 | 1810.6 | 11.040 |
| 4/1/2004 | 1815.6 | 12.110 | 4/1/2005 | 1808.65 | 10.632 | 4/1/2006 | 1810.7 | 11.076 |
| 5/1/2004 | 1814.7 | 11.989 | 5/1/2005 | 1806.47 | 10.189 | 5/1/2006 | 1812.5 | 11.460 |
| 6/1/2004 | 1815.3 | 12.121 | 6/1/2005 | 1808.8 | 10.665 | 6/1/2006 | 1814.7 | 11.992 |
| 7/1/2004 | 1816.5 | 12.426 | 7/1/2005 | 1814.9 | 12.026 | 7/1/2006 | 1817.4 | 12.629 |
| 8/1/2004 | 1816.5 | 12.401 | 8/1/2005 | 1817.17 | 12.591 | 8/1/2006 | 1815.5 | 12.172 |
| 9/1/2004 | 1814.3 | 11.914 | 9/1/2005 | 1815.56 | 12.216 | 9/1/2006 | | |
| 10/1/2004 | 1813.3 | 11.645 | 10/1/2005 | 1814.11 | 11.861 | 10/1/2006 | | |
| 11/1/2004 | 1813.1 | 11.589 | 11/1/2005 | 1814.00 | 11.837 | 11/1/2006 | | |
| 12/1/2004 | 1812.3 | 11.422 | 12/1/2005 | 1813.50 | 11.707 | 12/1/2006 | | |
| 1/1/2005 | 1810 | 10.936 | 1/1/2006 | 1812.0 | 11.371 | 1/1/2007 | | |



Oahe, SD

| Water Year 2004 (FEB 2004 – JAN 2005) | | | Water Year 2005 (FEB 2005 – JAN 2006) | | | Water Year 2006 (FEB 2006 – JAN 2007) | | |
|--|-----------|----------------------|--|-----------|----------------------|--|-----------|----------------------|
| Date | Elevation | Storage (MAC-Ft.) | Date | Elevation | Storage (MAC-Ft.) | Date | Elevation | Storage (MAC-Ft.) |
| 2/1/2004 | 1577.6 | 11.204 | 2/1/2005 | 1575.2 | 10.715 | 2/1/2006 | 1576.8 | 11.037 |
| 3/1/2004 | 1579.2 | 11.504 | 3/1/2005 | 1576.2 | 10.924 | 3/1/2006 | 1577.6 | 11.209 |
| 4/1/2004 | 1582.1 | 12.110 | 4/1/2005 | 1574.29 | 10.568 | 4/1/2006 | 1576.7 | 11.024 |
| 5/1/2004 | 1581.6 | 12.056 | 5/1/2005 | 1574.82 | 10.608 | 5/1/2006 | 1577.4 | 11.150 |
| 6/1/2004 | 1578.4 | 11.338 | 6/1/2005 | 1576.47 | 10.980 | 6/1/2006 | 1577.0 | 11.088 |
| 7/1/2004 | 1576.8 | 11.045 | 7/1/2005 | 1577.6 | 11.214 | 7/1/2006 | 1575.8 | 10.880 |
| 8/1/2004 | 1574.3 | 10.540 | 8/1/2005 | 1576.38 | 10.958 | 8/1/2006 | 1573.4 | 10.378 |
| 9/1/2004 | 1572.1 | 10.112 | 9/1/2005 | 1572.64 | 10.363 | 9/1/2006 | | |
| 10/1/2004 | 1573.2 | 10.316 | 10/1/2005 | 1572.63 | 10.267 | 10/1/2006 | | |
| 11/1/2004 | 1574.8 | 10.608 | 11/1/2005 | 1573.90 | 10.501 | 11/1/2006 | | |
| 12/1/2004 | 1576 | 10.866 | 12/1/2005 | 1575.6 | 10.814 | 12/1/2006 | | |
| 1/1/2005 | 1575.8 | 10.824 | 1/1/2006 | 1575.6 | 10.778 | 1/1/2007 | | |

