

## APPENDIX B – DATA QUALITY

### GOAL 1 OBJECTIVE 1

**FY 2006 Performance Measure:** Number of countries completing phase out of leaded gasoline.

**Performance Database:** UNEP Partnership Clearinghouse; This performance measure tracks the number of countries that have phased out lead in gasoline. EPA works with the United Nations Environment Programme (UNEP) and other partners in the global Partnership for Clean Fuels and Vehicles to document the phase out of leaded gasoline and the reduction of sulfur levels in fuels worldwide. UNEP manages the Partnership Clearinghouse, which tracks the status of lead phase-out efforts and the status of sulfur reduction efforts in each country. The Partnership Clearinghouse also documents and verifies each country's implementation of lead phase out and sulfur reduction programs. The Partnership's data on lead phase-out can be found on the Partnership website at: <http://www.unep.org/PCFV/Data/data.htm#leaded>. The Partnership's data on sulfur levels in fuels, by country, can be found on the Partnership website at: <http://www.unep.org/PCFV/Data/data.htm#sulphur>.

**Data Source:** The United Nations Environment Programme serves as the Clearinghouse for the Partnership for Clean Fuels and Vehicles and maintains a database of the status of country lead-phase out. Information from the database is posted on the Partnership website and updated periodically by UNEP--at least every 6 months. UNEP collects the data from public and private sector partners and contacts government and industry experts in each country for verification before the data are posted. This data collection and cross-checking provide the best currently available information on country lead phase-out status and levels of sulfur.

**Methods, Assumptions and Suitability:** There is currently no available database on international leaded gasoline sales data or market penetration of alternative fuels, nor is there any international database on sulfur levels in fuels. Because of this gap, the Partnership made the decision to track the number of countries that have phased out lead and reduced sulfur because the data are more easily verifiable.

**QA/QC Procedures:** Experts at the Partnership for Clean Fuels and Vehicles verify the information in the Partnership Clearinghouse by contacting key people from industry and government within each country.

**Data Limitations:** There currently is no available database on leaded gasoline sales data or market penetration of alternative fuels. The Partnership made the decision to track the number of countries that have phased out lead and reduced sulfur in fuels, because the data are more easily verifiable. Fuel changes and lead phase-out are implemented in different ways in different countries, mostly by legislation. But having the legislation in place does not mean that lead has been eliminated from gasoline. Many countries have set dates for lead phase-out and sulfur reduction; however the Partnership tracks actual progress toward implementation.

**References:** For additional information on the Partnership for Clean Fuels and Vehicles, see the Partnership website at <http://www.unep.org/PCFV>. For more information concerning the database for phase-out of leaded gasoline, see <http://www.unep.org/PCFV/Data/data.htm#leaded>.

**FY 2006 Performance Measures:**

- **Annual percentage of combined stationary and mobile source reductions in air toxics emissions.**
- **Total cumulative reductions in air toxics emissions.**
- **Mobile source air toxics emissions reduced.**
- **Major stationary source air toxics emissions reduced.**
- **Area and all other air toxics emissions reduced.**

**Performance Database:** National Emissions Inventory (NEI) for Hazardous Air Pollutants (HAPs).

**Data Source:** To calculate performance measures, the data source used is the NEI for HAPs which includes emissions from large and small industrial sources inventoried as point sources, smaller stationary area and other sources, such as fires inventoried as non-point sources, and mobile sources.

Prior to the 1999 NEI for HAPs, there was the National Toxics Inventory (NTI). The baseline NTI (for base years 1990 - 1993) includes emissions information for 188 hazardous air pollutants from more than 900 stationary sources and from mobile sources. It is based on data collected during the development of Maximum Achievable Control Technology (MACT) standards, state and local data, Toxics Release Inventory (TRI) data, and emissions estimates using accepted emission inventory methodologies. The baseline NTI contains county level emissions data, not facility-specific data.

The 1996 NTI and 1999 NEI for HAPs contain estimates of facility-specific HAP emissions and their source specific parameters such as location (latitude and longitude) and facility characteristics (stack height, exit velocity, temperature, etc.)

The primary source of data in the 1996 and 1999 NTI is state and local air pollution control agencies and Tribes. These data vary in completeness, format, and quality. EPA evaluates these data and supplements them with data gathered while developing MACT and residual risk standards, industry data, and TRI data. To produce a complete national inventory, EPA estimates emissions for approximately 30 non-point source categories such as wildfires and residential heating sources not included in the state, local and Tribal data. Mobile source data are developed using data provided by state and local agencies and Tribes and the most current on road and nonroad models developed by EPA's Office of Transportation and Air Quality. The draft 1996 NTI and 1999 NEI for HAPS underwent extensive review by state and local agencies, Tribes, industry, EPA, and the public.

For more information and references on the development of the NEI for HAPs, please go to: <http://www.epa.gov/ttn/chief/net/index.html>.

**Methods, Assumptions and Suitability:** To produce a complete model-ready national inventory, EPA estimates emissions for approximately 30 non-point source categories such as wildfires and residential heating sources not included in the state, local and Tribal data. Mobile source data are developed using data provided by state and local agencies and Tribes and the most current on road and nonroad models developed by EPA's Office of Transportation and Air Quality.

Upon development of the inventory, the EMS-HAP (Emissions Modeling System for Hazardous Air Pollutants) is used to estimate annual emissions of air toxics for the 1996 NTI and 1999 NEI

for HAPS (and for all years in-between). The EMS-HAP can project future emissions, by adjusting stationary source emission data to account for growth and emission reductions resulting from emission reduction scenarios such as the implementation of the Maximum Achievable Control Technology (MACT) standards.

For more information and references on EMS-HAP, please go to the following web sites: <ftp://ftp.epa.gov/scram002/emshad> and <http://www.epa.gov/ttn/chief/emch/projection/emshap.html>.

The growth and reduction information used for the projections are further described on the following website: <http://www.epa.gov/ttn/chief/emch/projection/emshap.html>.

**QA/QC Procedures:** The NTI and the NEI for HAPs are databases designed to house information from other primary sources. The EPA performs extensive quality assurance/quality control (QA/QC) activities, including checking data provided by other organizations, to improve the quality of the emission inventory. Some of these activities include: (1) the use of an automated format QC tool to identify potential errors of data integrity, code values, and range checks; (2) use of geographical information system (GIS) tools to verify facility locations; and (3) automated content analysis by pollutant, source category and facility to identify potential problems with emission estimates such as outliers, duplicate sites, duplicate emissions, coverage of a source category, etc. The content analysis includes a variety of comparative and statistical analyses. The comparative analyses help reviewers prioritize which source categories and pollutants to review in more detail based on comparisons using current inventory data and prior inventories. The statistical analyses help reviewers identify potential outliers by providing the minimum, maximum, average, standard deviation, and selected percentile values based on current data. The EPA is currently developing an automated QC content tool for data providers to use prior to submitting their data to EPA. After investigating errors identified using the automated QC format and GIS tools, the EPA follows specific guidance on augmenting data for missing data fields. This guidance is available at: [ftp://ftp.epa.gov/emisinventory/2002finalnei/documentation/point/augmentationpoint/2002nei\\_qa\\_augmentation\\_report0206.pdf](ftp://ftp.epa.gov/emisinventory/2002finalnei/documentation/point/augmentationpoint/2002nei_qa_augmentation_report0206.pdf).

The NTI database contains data fields that indicate if a field has been augmented and identifies the augmentation method. After performing the content analysis, the EPA contacts data providers to reconcile potential errors. The draft NTI is posted for external review and includes a README file, with instructions on review of data and submission of revisions, state-by-state modeling files with all modeled data fields, and summary files to assist in the review of the data. One of the summary files includes a comparison of point source data submitted by different organizations. During the external review of the data, state and local agencies, Tribes, and industry provide external QA of the inventory. The EPA evaluates proposed revisions from external reviewers and prepares memos for individual reviewers documenting incorporation of revisions and explanations if revisions were not incorporated. All revisions are tracked in the database with the source of original data and sources of subsequent revision.

The external QA and the internal QC of the inventory have resulted in significant changes in the initial emission estimates, as seen by comparison of the initial draft NEI for HAPs and its final version. For more information on QA/QC of the NEI for HAPs, please refer to the following web site for instructions for accessing a paper presented at the 2002 Emission Inventory Conference in Atlanta. "QA/QC - An Integral Step in the Development of the 1999 National Emission Inventory for HAPs," Anne Pope, et al. [www.epa.gov/ttn/chief/conference/ei11/](http://www.epa.gov/ttn/chief/conference/ei11/).

EPA's Office of Environmental Information (OEI) has created uniform data standards or elements, which provide "meta" information on the standard NEI Input Format (NIF) fields. These standards were developed by teams representing states, Tribes, EPA and other Federal agencies. The use of common data standards among partners fosters consistently defined and formatted data elements and sets of data values, and provides public access to more meaningful data. The standards relevant to the NEI for HAPs are the: SIC/NAICS, Latitude/Longitude, Chemical Identification, Facility Identification, Date, Tribal and Contact Data Standards. The 1999 NEI for HAPs is compliant with all new data standards except the Facility Identification Standard because OEI has not completed its assignment of Facility IDs to the 1999 NEI for HAPs facilities.

For more information on compliance of the NEI for HAPs with new OMB Information Quality Guidelines and new EPA data standards, please refer to the following web site for instructions for accessing a paper presented at the 2003 Emission Inventory Conference in San Diego: "The Challenge of Meeting New EPA Data Standards and Information Quality Guidelines in the Development of the 2002 NEI Point Source Data for HAPs," Anne Pope, et al. <http://www.epa.gov/ttn/chief/conference/ei12/>. The 2002 NEI for HAPs will undergo scientific peer review in early 2005.

**Data Quality Review:** EPA staff, state and local agencies, Tribes, industry and the public review the NTI and the NEI for HAPs. To assist in the review of the 1999 NEI for HAPs, the EPA provided a comparison of data from the three data sources (MACT/residual risk data, TRI, and state, local and Tribal inventories) for each facility. For the 1999 NEI for HAPs, two periods were available for external review - October 2001 - February 2002 and October 2002 - March 2003. The final 1999 NEI was completed and posted on the Agency website in the fall of 2003. Beginning in 2005, the NTI will undergo an external scientific peer review.

In 2001, EPA's Science Advisory Board (SAB) reviewed the EMS-HAP model as part of the 1996 national-scale assessment. The review was generally supportive of the assessment purpose, methods, and presentation; the committee considers this an important step toward a better understanding of air toxics. Additional information is available on the Internet: <http://www.epa.gov/ttn/atw/nata/peer.html>.

**Data Limitations:** While emissions estimating techniques have improved over the years, broad assumptions about the behavior of sources and serious data limitations still exist. The NTI and the NEI for HAPs contain data from other primary references. Because of the different data sources, not all information in the NTI and the NEI for HAPs has been developed using identical methods. Also, for the same reason, there are likely some geographic areas with more detail and accuracy than others. Because of the lesser level of detail in the baseline NTI, it is currently not suitable for input to dispersion models. For further discussion of the data limitations and the error estimates in the 1999 NEI for HAPs, please refer to the discussion of Information Quality Guidelines in the documentation at: <http://www.epa.gov/ttn/chief/net/index.html#haps99>.

In 2004, the Office of the Inspector General (OIG) released a final evaluation report on "EPA's Method for Calculating Air Toxics Emissions for Reporting Results Needs Improvement" (report can be found at <http://www.epa.gov/oig/reports/2004/20040331-2004-p-00012.pdf>) The report stated that although the methods used have improved substantially, unvalidated assumptions and other limitations underlying the NTI continue to impact its use as a GPRA performance measure. As a result of this evaluation and the OIG recommendations for improvement, EPA prepared an action plan and is looking at way to improve the accuracy and reliability of the data.

EPA will meet bi-annually with OIG to report on its progress in completing the activities as outlined in the action plan.

**Error Estimate:** Error estimate cannot be tabulated on account of data limitations as described above.

**New/Improved Data or Systems:** The 1996 NTI and 1999 NEI for HAPs are a significant improvement over the baseline 1993 NTI because of the added facility-level detail (e.g., stack heights, latitude/longitude locations), making it more useful for dispersion model input. Future inventories (2002 and later years) are expected to improve significantly because of increased interest in the NEI for HAPs by regulatory agencies, environmental interests, and industry, and the greater potential for modeling and trend analysis. During the development of the 1999 NEI for HAPs, all primary data submitters and reviewers were required to submit their data and revisions to EPA in a standardized format using the Agency's Central Data Exchange (CDX). For more information on CDX, please go the following web site: <http://www.epa.gov/ttn/chief/nif/cdx.html>.

**References:** The NTI and NEI data and documentation are available at the following sites: <ftp://ftp.epa.gov/EmisInventory/> and [www.epa.gov/ttn/chief](http://www.epa.gov/ttn/chief).

**FY 2006 Performance Measures:**

- **Tons of SO<sub>2</sub> emissions from electric power generation sources (tons/yr from 1980 baseline). (PART measure)**

**Performance Databases:**

- Emissions Tracking System (ETS) - SO<sub>2</sub> and NO<sub>x</sub> emissions.

**Data Sources:** On a quarterly basis, ETS receives and processes hourly measurements of SO<sub>2</sub>, NO<sub>x</sub>, volumetric flow, CO<sub>2</sub>, and other emission-related parameters from more than 3,400 fossil fuel-fired utility units affected under the Title IV Acid Rain Program. These measurements are collected by certified continuous emission monitoring systems (CEMS) or equivalent continuous monitoring methods.

**Methods, Assumption, and Suitability** Promulgated methods are used to aggregate emissions data across all United States' utilities for each pollutant and related source operating parameters such as heat input.

**QA/QC Procedures:** Promulgated QA/QC requirements dictate performing a series of quality assurance tests of CEMS performance. For these tests, emissions data are collected under highly structured, carefully designed testing conditions, which involve either high quality standard reference materials or multiple instruments performing simultaneous emission measurements. The resulting data are screened and analyzed using a battery of statistical procedures, including one that tests for systematic bias. If a CEM fails the bias test, indicating a potential for systematic underestimation of emissions, the source of the error must be identified and corrected or the data are adjusted to minimize the bias. Each affected plant is required to maintain a written QA plan documenting performance of these procedures and tests. Further information is available at: <http://www.epa.gov/airmarkets/reporting/index.html>.

**Data Quality Review:** The ETS provides instant feedback to sources on data reporting problems, format errors, and inconsistencies. The electronic data file QA checks are described at <http://www.epa.gov/airmarkets/reporting/index.html> (see *Electronic Data Report Review*

*Process, ETS Tolerance Tables, Active ETS Error Codes/Messages and Range Format Errors*). All quarterly reports are analyzed to detect deficiencies and to identify reports that must be resubmitted to correct problems. EPA also identifies reports that were not submitted by the appropriate reporting deadline. Revised quarterly reports, with corrected deficiencies found during the data review process, must be obtained from sources by a specified deadline. All data are reviewed, and preliminary and final emissions data reports are prepared for public release and compliance determination.

**FY 2006 Performance Measures:**

- **Cumulative percentage reduction in tons of toxicity-weighted (for cancer risk) emissions of air toxics. (PART measure)**
- **Cumulative percentage reduction in tons of toxicity-weighted (for noncancer risk) emissions of air toxics. (PART measure)**

**Performance Databases:** National Emissions Inventory (NEI) for Hazardous Air Pollutants (HAPs); and EPA's Health Criteria Data for Risk Characterization.

**Data Source:** To better measure the percentage change in cancer and noncancer risk to the public, a toxicity-weighted emission inventory performance measure has been developed. This measure utilizes data from the NEI for air toxics along with data from EPA's Health Criteria Data for Risk Characterization (found at <http://www.epa.gov/ttn/atw/toxsource/summary.html>), which is a compendium of cancer and noncancer health risk criteria used to develop a risk metric. This compendium includes tabulated values for long-term (chronic) inhalation for many of the 188 hazardous air pollutants. These health risk data were obtained from various data sources including EPA, the U.S. Agency for Toxic Substances and Disease Registry, California Environmental Protection Agency, and the International Agency for Research on Cancer. The numbers from the health risk database are used for estimating the risk of contracting cancer and the level of hazard associated with adverse health effects other than cancer.

The NEI for HAPs includes emissions from large and small industrial sources inventoried as point sources, smaller stationary area and other sources, such as fires inventoried as non-point sources, and mobile sources. Prior to 1999 NEI for HAPs, there was the National Toxics Inventory (NTI). The baseline NTI (for base years 1990 - 1993) includes emissions information for 188 hazardous air pollutants from more than 900 stationary sources and from mobile sources. It is based on data collected during the development of Maximum Achievable Control Technology (MACT) standards, state and local data, Toxics Release Inventory (TRI) data, and emissions estimates using accepted emission inventory methodologies. The baseline NTI contains county level emissions data and cannot be used for modeling because it does not contain facility specific data.

The 1996 NTI and the 1999 NEI for HAPs contain stationary and mobile source estimates. These inventories also contain estimates of facility-specific HAP emissions and their source specific parameters such as location (latitude and longitude) and facility characteristics (stack height, exit velocity, temperature, etc).

The primary source of data in the 1996 and 1999 inventories are state and local air pollution control agencies and Tribes. These data vary in completeness, format, and quality. EPA evaluates these data and supplements them with data gathered while developing MACT and residual risk standards, industry data, and TRI data.

For more information and references on the development of the 1999 NEI for HAPs, please go to the following web site: <http://www.epa.gov/ttn/chief/net/index.html>.

**Methods, Assumptions and Suitability:** As the NEI is only developed every three years, EPA utilizes an emissions modeling system to project inventories for “off-years” and to project the inventory into the future. This model, the EMS-HAP (Emissions Modeling System for Hazardous Air Pollutants), can project future emissions, by adjusting stationary source emission data to account for growth and emission reductions resulting from emission reduction scenarios such as the implementation of the Maximum Achievable Control Technology (MACT) standards.

Once the EMS-HAP process has been performed, the EPA would tox-weight the inventory by “weighting” the emissions for each pollutant with the appropriate health risk criteria. This would be accomplished through a multi-step process. Initially, pollutant by pollutant values would be obtained from the NEI for the current year and the baseline year (1990/93). Conversion of actual tons for each pollutant for the current year and the baseline year to “toxicity-weighted” tons would be accomplished by multiplying the appropriate values from the health criteria database such as the unit risk estimate (URE) or lifetime cancer risk (defined at <http://www.epa.gov/ttn/atw/nata/riskbg.html>) to get the noncancer tons. These toxicity-weighted values act as a surrogate for risk and allow EPA to compare the toxicity-weighted values against a 1990/1993 baseline of toxicity-weighted values to determine the percentage reduction in risk on an annual basis.

Complete documentation on development of the NEI for HAPs can be found at <http://www.epa.gov/ttn/chief/net/index.html>. For more information and references on EMS-HAP, go to the following web sites: <ftp://ftp.epa.gov/scram002/EMSHAP> and <http://www.epa.gov/ttn/chief/emch/projection/emshap.html>. The growth and reduction information used for the projections are further described at <http://www.epa.gov/ttn/chief/emch/projection/emshap.html>.

**QA/QC Procedures:** The NTI and the NEI for HAPs are databases designed to house information from other primary sources. The EPA performs extensive quality assurance/quality control (QA/QC) activities, including checking data provided by other organizations, to improve the quality of the emission inventory. Some of these activities include: (1) the use of an automated format QC tool to identify potential errors of data integrity, code values, and range checks; (2) use of geographical information system (GIS) tools to verify facility locations; and (3) automated content analysis by pollutant, source category and facility to identify potential problems with emission estimates such as outliers, duplicate sites, duplicate emissions, coverage of a source category, etc. The content analysis includes a variety of comparative and statistical analyses. The comparative analyses help reviewers prioritize which source categories and pollutants to review in more detail based on comparisons using current inventory data and prior inventories. The statistical analyses help reviewers identify potential outliers by providing the minimum, maximum, average, standard deviation, and selected percentile values based on current data. The EPA has developed an automated QC content tool for data providers to use prior to submitting their data to EPA. After investigating errors identified using the automated QC format and GIS tools, the EPA follows specific guidance on augmenting data for missing data fields. This guidance is available at the following web site: [ftp://ftp.epa.gov/emisinventory/2002finalnei/documentation/point/augmentationpoint/2002nei\\_qa\\_augmentation\\_report0206.pdf](ftp://ftp.epa.gov/emisinventory/2002finalnei/documentation/point/augmentationpoint/2002nei_qa_augmentation_report0206.pdf).

The NTI database contains data fields that indicate if a field has been augmented and identifies the augmentation method. After performing the content analysis, the EPA contacts data providers to reconcile potential errors. The draft NTI is posted for external review and includes a README file, with instructions on review of data and submission of revisions, state-by-state modeling files with all modeled data fields, and summary files to assist in the review of the data. One of the summary files includes a comparison of point source data submitted by different organizations. During the external review of the data, state and local agencies, Tribes, and industry provide external QA of the inventory. The EPA evaluates proposed revisions from external reviewers and prepares memos for individual reviewers documenting incorporation of revisions and explanations if revisions were not incorporated. All revisions are tracked in the database with the source of original data and sources of subsequent revision.

The external QA and the internal QC of the inventory have resulted in significant changes in the initial emission estimates, as seen by comparison of the initial draft NEI for HAPs and its final version. For more information on QA/QC of the NEI for HAPs, please refer to the following web site for instructions for accessing a paper presented at the 2002 Emission Inventory Conference in Atlanta. "QA/QC - An Integral Step in the Development of the 1999 National Emission Inventory for HAPs", Anne Pope, et al. [www.epa.gov/ttn/chief/conference/ei11/](http://www.epa.gov/ttn/chief/conference/ei11/)

EPA's Office of Environmental Information (OEI) has created uniform data standards or elements, which provide "meta" information on the standard NEI Input Format (NIF) fields. These standards were developed by teams representing states, Tribes, EPA and other Federal agencies. The use of common data standards among partners fosters consistently defined and formatted data elements and sets of data values, and provides public access to more meaningful data. The standards relevant to the NEI for HAPs are the: SIC/NAICS, Latitude/Longitude, Chemical Identification, Facility Identification, Date, Tribal and Contact Data Standards. The 1999 NEI for HAPs is compliant with all new data standards except the Facility Identification Standard because OEI has not completed its assignment of Facility IDs to the 1999 NEI for HAPs facilities.

For more information on compliance of the NEI for HAPs with new OMB Information Quality Guidelines and new EPA data standards, please refer to the following web site for instructions for accessing a paper presented at the 2003 Emission Inventory Conference in San Diego. "The Challenge of Meeting New EPA Data Standards and Information Quality Guidelines in the Development of the 2002 NEI Point Source Data for HAPs", Anne Pope, et al. <http://www.epa.gov/ttn/chief/conference/ei12/>. The 2002 NEI for HAPs will undergo scientific peer review in early 2005.

The tables used in the EPA's Health Criteria Data for Risk Characterization (found at <http://www.epa.gov/ttn/atw/toxsource/summary.html>) are compiled assessments from various sources for many of the 188 substances listed as hazardous air pollutants under the Clean Air Act of 1990. Because different sources developed these assessments at different times for purposes that were similar but not identical, results are not totally consistent. To resolve these discrepancies and ensure the validity of the data, EPA applied a consistent priority scheme consistent with EPA risk assessment guidelines and various levels of scientific peer review. These risk assessment guidelines can be found at <http://www.epa.gov/ncea/raf/car2sab/preamble.pdf>.

**Data Quality Review:** EPA staff, state and local agencies, Tribes, industry and the public review the NTI and the NEI for HAPs. To assist in the review of the 1999 NEI for HAPs, the EPA provided a comparison of data from the three data sources (MACT/residual risk data, TRI,

and state, local and Tribal inventories) for each facility. For the 1999 NEI for HAPs, two periods were available for external review - October 2001 - February 2002 and October 2002 - March 2003. The final 1999 NEI was completed and posted on the Agency website in the fall of 2003. Beginning in 2005, the NTI will undergo an external scientific peer review.

The EMS-HAP has been subjected to the scrutiny of leading scientists throughout the country in a process called "scientific peer review". This ensures that EPA uses the best available scientific methods and information. In 2001, EPA's Science Advisory Board (SAB) reviewed the EMS-HAP model as part of the 1996 national-scale assessment. The review was generally supportive of the assessment purpose, methods, and presentation; the committee considers this an important step toward a better understanding of air toxics. Additional information is available on the Internet: <http://www.epa.gov/ttn/atw/nata/peer.html>

The data compiled in the Health Criteria Data for Risk Characterization (found at <http://www.epa.gov/ttn/atw/toxsource/summary.html>) are reviewed to make sure they support hazard identification and dose-response assessment for chronic exposures as defined in the National Academy of Sciences (NAS) risk assessment paradigm <http://www.epa.gov/ttn/atw/toxsource/paradigm.html>. Because the health criteria data were obtained from various sources they are prioritized for use (in developing the performance measure, for example) according to 1) conceptual consistency with EPA risk assessment guidelines and 2) various levels of scientific peer review. The prioritization process is aimed at incorporating the best available scientific data.

**Data Limitations and Error Estimates:** While emissions estimating techniques have improved over the years, broad assumptions about the behavior of sources and serious data limitations still exist. The NTI and the NEI for HAPs contain data from other primary references. Because of the different data sources, not all information in the NTI and the NEI for HAPs has been developed using identical methods. Also, for the same reason, there are likely some geographic areas with more detail and accuracy than others. Because of the lesser level of detail in the baseline NTI, it is currently not suitable for input to dispersion models. For further discussion of the data limitations and the error estimates in the 1999 NEI for HAPs, please refer to the discussion of Information Quality Guidelines in the documentation at: <http://www.epa.gov/ttn/chief/net/index.html#haps99>.

In 2004, the Office of the Inspector General (OIG) released a final evaluation report on "EPA's Method for Calculating Air Toxics Emissions for Reporting Results Needs Improvement" (report can be found at [www.epa.gov/oig/reports/2004/20040331-2004-p-00012.pdf](http://www.epa.gov/oig/reports/2004/20040331-2004-p-00012.pdf)). The report stated that although the methods used have improved substantially, unvalidated assumptions and other limitations underlying the NTI continue to impact its use as a GPRA performance measure. As a result of this evaluation and the OIG recommendations for improvement, EPA prepared an action plan and is looking at ways to improve the accuracy and reliability of the data. EPA will meet bi-annually with OIG to report on its progress in completing the activities as outlined in the action plan.

While the Agency has made every effort to utilize the best available science in selecting appropriate health criteria data for toxicity-weighting calculations there are inherent limitations and errors (uncertainties) associated with this type of data. While it is not practical to expose humans to chemicals at target doses and observe subsequent health implications over long periods of time, most of the agencies health criteria is derived from response models and laboratory experiments involving animals. The parameter used to convert from exposure to cancer risk (i.e. the Unit Risk Estimate or URE) is based on default science policy processes

used routinely in EPA assessments. First, some air toxics are known to be carcinogens in animals but lack data in humans. These have been assumed to be human carcinogens. Second, all the air toxics in this assessment were assumed to have linear relationships between exposure and the probability of cancer (i.e. effects at low exposures were extrapolated from higher, measurable, exposures by a straight line). Third, the URE used for some air toxics compounds represents a maximum likelihood estimate, which might be taken to mean the best scientific estimate. For other air toxics compounds, however, the URE used was an “upper bound” estimate, meaning that it probably leads to an overestimation of risk if it is incorrect. For these upper bound estimates, it is assumed that the URE continues to apply even at low exposures. It is likely, therefore, that this linear model over-predicts the risk at exposures encountered in the environment. The cancer weighting-values for this approach should be considered “upper bound” in the science policy sense.

All of the noncancer risk estimates have a built-in margin of safety. All of the Reference Concentrations (RfCs) used in toxicity-weighting of noncancer are conservative, meaning that they represent exposures which probably do not result in any health effects, with a margin of safety built into the RfC to account for sources of uncertainty and variability. Like the URE used in cancer weighting the values are, therefore, considered “upper bound” in the science policy sense. Further details on limitations and uncertainties associated with the agencies health data can be found at: [www.epa.gov/ttn/atw/nata/roy/page9.html#L10](http://www.epa.gov/ttn/atw/nata/roy/page9.html#L10).

**New/Improved Data or Systems:** The 1996 NTI and 1999 NEI for HAPs are a significant improvement over the baseline NTI because of the added facility-level detail (e.g., stack heights, latitude/longitude locations), making it more useful for dispersion model input. Future inventories (2002 and later years) are expected to improve significantly because of increased interest in the NEI for HAPs by regulatory agencies, environmental interests, and industry, and the greater potential for modeling and trend analysis. During the development of the 1999 NEI for HAPs, all primary data submitters and reviewers were required to submit their data and revisions to EPA in a standardized format using the Agency’s Central Data Exchange (CDX). For more information on CDX, please go the following web site: <http://www.epa.gov/ttn/chief/nif/cdx.html>

Beginning in 2006, the toxicity-weighted emission inventory data will also be used as a measurement to predict exposure and risk to the public. This measure will utilize ambient monitoring of air toxics as a surrogate for population exposure and compare these values with health benchmarks to predict risks.

**References:** The NTI and NEI data and documentation are available at the following sites: <ftp://ftp.epa.gov/EmisInventory/>, <http://www.epa.gov/ttn/atw/nata1999/nsata99.html>, and [www.epa.gov/ttn/chief](http://www.epa.gov/ttn/chief). Information on the Emissions Modeling System for Hazardous Air Pollutants: <http://www.epa.gov/ttn/atw/nata/natsa2.html#model> and <http://www.epa.gov/ttn/chief/emch/projection/emshap.html>. Information on EPA’s Health Criteria Data for Risk Characterization: <http://www.epa.gov/ttn/atw/toxsource/summary.html>.

**FY 2006 Performance Measures:**

- **Cumulative percent increase in the number of people who live in areas with ambient CO, SO<sub>2</sub>, NO<sub>2</sub> or Pb Concentrations below the level of the NAAQS as compared to 1992.**
- **Cumulative percent increase in the number of areas with CO, SO<sub>2</sub>, NO<sub>2</sub> or Pb concentrations below the level of the NAAQS as compared to 1992.**
- **Total number of people who live in areas measuring clean air for CO, SO<sub>2</sub>, NO<sub>2</sub> or Pb.**

- **Areas measuring clean air for CO, SO<sub>2</sub>, NO<sub>2</sub> or Pb.**
- **Additional people living in new areas measuring clean air for CO, SO<sub>2</sub>, NO<sub>2</sub> or Pb.**

**Performance Databases:** The Air Quality Subsystem (AQS) stores ambient air quality data used to evaluate an area's air quality levels relative to the NAAQS. The AQS database is updated daily, primarily by the staff of state and local environmental agencies responsible for measuring ambient concentrations of criteria air pollutants at several thousand monitoring sites in all states and territories. EPA pulls the data on a calendar year basis.

The Findings and Required Elements Data System is used to track progress of states and Regions in reviewing and approving the required data elements of the State Implementation Plans (SIP). SIPs are clean air plans and define what actions a state will take to improve the air quality in areas that do not meet national ambient air quality standards. The data are collected on a fiscal year basis.

**Data Source:** State & local agency data from State and Local Air Monitoring Stations (SLAMS), data from Census-Bureau/Department of Commerce, as well as data provided by EPA's Regional offices.

**Methods, Assumptions, and Suitability:** Air quality levels are evaluated relative to the level of the appropriate NAAQS. Next the populations in areas with air quality concentrations above the level of the NAAQS are aggregated. This analysis assumes that the populations of the areas are held constant at year 2000 Census levels. Data comparisons over several years allow assessment of the air program's success.

**QA/QC Procedures:** The QA/QC of the national air monitoring program has several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, EPA's National Performance Audit Program (NPAP), system audits, and network reviews (Available on the Internet: [www.epa.gov/ttn/amtic/npaplist.html](http://www.epa.gov/ttn/amtic/npaplist.html)). To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and site criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and record keeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections. Further information available at: <http://www.epa.gov/cludygxb/programs/namslam.html> and through United States EPA's Quality Assurance Handbook (EPA-454/R-98-004 Section 15).

**Data Quality Review:** No external audits have been done in the last 3 years on AQS. However, internal audits are regularly conducted.

**Error Estimate:** At this time it is not possible to develop an error estimate. There is still too much uncertainty in the projections and near term variations in air quality (due to meteorological conditions for example) exists.

**New/Improved Data or Systems:** In January 2002, EPA completed the reengineering of AQS to make it a more user friendly, Windows-based system. As a result, air quality data are more easily accessible via the Internet. AQS has also been enhanced to comply with the Agency's data standards (e.g., latitude/longitude, chemical nomenclature). Beginning in July 2003, agencies submitted air quality data to AQS thru the Agency's Central Data Exchange (CDX).

CDX is intended to be the portal through which all environmental data coming to or leaving the Agency will pass.

**References:** For additional information about criteria pollutant data, non-attainment areas, and other related information see: <http://www.epa.gov/airtrends/>.

**FY 2006 Performance Measures:**

- **Reduction in population-weighted ambient concentration of fine particulate matter (PM 2.5) in all monitored counties. (PART measure)**
- **Reduction in population-weighted ambient concentration of ozone in monitored counties. (PART measure)**

**Performance Databases:** The Air Quality Subsystem (AQS) stores ambient air quality data used to evaluate an area's air quality levels relative to the NAAQS. The Findings and Required Elements Data System is used to track progress of states and Regions in reviewing and approving the required data elements of the State Implementation Plans (SIP). SIPs are clean air plans and define what actions a state will take to improve the air quality in areas that do not meet national ambient air quality standards.

**Data Source:** State & local agency data from State and Local Air Monitoring Stations (SLAMS), data from Census-Bureau/Department of Commerce, as well as data provided by EPA's Regional offices.

**Methods, Assumptions, and Suitability:** Design values are calculated for every county with adequate monitoring data (for more information on and a definition for design values, see <http://www.epa.gov/ttn/oarpg/t1/memoranda/cdv.pdf>). Air quality levels are evaluated relative to the baseline level and the design value. The change in air quality concentrations is then multiplied by the number of people living in the county. This analysis assumes that the populations of the areas are held constant at 2000 Census levels. Data comparisons over several years allow assessment of the air program's success.

**QA/QC Procedures, Data Quality Review, Error Estimate, New/Improved Data or Systems, and References:** Same as previous write-up.

**FY 2006 Performance Measures:**

- **Millions of tons of volatile organic compounds (VOCs) reduced since 2000 from mobile sources. (PART measure)**
- **Millions of tons of nitrogen oxide (NOx) reduced since 2000 from mobile sources. (PART measure)**
- **Tons of particulate matter (PM 10) reduced since 2000 from mobile sources. (PART measure)**
- **Tons of particulate matter (PM 2.5) reduced since 2000 from mobile sources. (PART measure)**
- **Limit the increase of CO Emissions (in tons) from mobile sources. (PART measure)**

**Performance Database:** National Emissions Inventory Database available at: <http://www.epa.gov/ttn/chief/trends/>.

**Data Source:** Mobile source emissions inventories and Regulatory Impact Analyses. Estimates for on-road, off-road mobile source emissions are built from inventories fed into the relevant models, which in turn provide input to the National Emissions Inventory Database.

The MOBILE vehicle emission factor model is a software tool for predicting gram per mile emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide, particulate matter, and toxics from cars, trucks, and motorcycles under various conditions. Inputs to the model include fleet composition, activity, temporal information, and control program characteristics.

The NONROAD emission inventory model is a software tool for predicting emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, particulate matter, and sulfur dioxides from small and large off road vehicles, equipment, and engines. Inputs to the model include fleet composition, activity and temporal information.

Certain mobile source information is updated annually. Inputs are updated annually only if there is a rationale and readily available source of annual data. Generally, Vehicle Miles Traveled (VMT), the mix of VMT by type of vehicle (Federal Highway Administration (FHWA)-types), temperature, gasoline properties, and the designs of Inspection/Maintenance (I/M) programs are updated each year. Emission factors for all mobile sources and activity estimates for non-road sources are changed only when the Office of Transportation and Air Quality requests that this be done and is able to provide the new information in a timely manner. The most recent models for mobile sources are Mobile 6 and Nonroad 2002. (Available on the Internet at <http://www.epa.gov/otaq/models.htm>.)

EPA regulatory packages always include detailed Regulatory Impact Analysis which estimates the costs industry is projected to accrue in meeting EPA regulations. These cost estimates will form the basis of the numbers in the EPA performance measures. Also, costs for the EPA mobile source program (including personnel costs) will be included also. Estimates will be made for various years for tons/dollar for pollutants (the total of HC, CO, NOx, and PM) removed.

**Methods, Assumptions, and Suitability:** EPA issues emissions standards that set limits on how much pollution can be emitted from a given mobile source. Mobile sources include vehicles that operate on roads and highways ("on road" or "highway" vehicles), as well as nonroad vehicles, engines, and equipment. Examples of mobile sources are cars, trucks, buses, earthmoving equipment, lawn and garden power tools, ships, railroad locomotives, and airplanes. Vehicle and equipment manufacturers have responded to many mobile source emission standards by redesigning vehicles and engines to reduce pollution.

EPA uses models to estimate mobile source emissions, for both past and future years. The estimates are used in a variety of different settings. The estimates are used for rulemaking.

The most complete and systematic process for making and recording such mobile source emissions is the "Trends" inventory process executed each year by the Office of Air Quality Planning and Standards' (OAQPS) Emissions, Monitoring, and Analysis Division (EMAD). The Assessment and Standards Division, within the Office of Transportation and Air Quality, provides EMAD information and methods for making the mobile source estimates. In addition, EMAD's contractors obtain necessary information directly from other sources; for example, weather data and the Federal Highway Administration's (FHWA) Vehicle Miles Traveled (VMT) estimates by state. EMAD creates and publishes the emission inventory estimate for the most

recent historical year, detailed down to the county level and with over 30 line items representing mobile sources. At irregular intervals as required for regulatory analysis projects, EMAD creates estimates of emissions for future years. When the method for estimating emissions changes significantly, EMAD usually revises its older estimates of emissions in years prior to the most recent year, to avoid a sudden discontinuity in the apparent emissions trend. EMAD publishes the national emission estimates in hardcopy; county-level estimates are available electronically. Additional information about transportation and air quality related to estimating, testing for, and measuring emissions, as well as research being conducted on technologies for reducing emissions is available at <http://www.epa.gov/otaq/research.htm>.

When major changes are made in the emission models or resulting inventories (and even the cost estimates), the performance measures will be reviewed to determine if they should be updated.

**QA/QC Procedures:** The emissions inventories are continuously improved.

**Data Quality Review:** The emissions inventories are reviewed by both internal and external parties, including the states, locals and industries.

**Data Limitations:** The limitations of the inventory estimates for mobile sources come from limitations in the modeled emission factors (based on emission factor testing and models predicting overall fleet emission factors in g/mile) and also in the estimated vehicle miles traveled for each vehicle class (derived from Department of Transportation data). <http://www.epa.gov/otaq/m6.htm>. For nonroad emissions, the estimates come from a model using equipment populations, emission factors per hour or unit of work, and an estimate of usage. This nonroad emissions model accounts for over 200 types of nonroad equipment. Any limitations in the input data will carry over into limitations in the emission inventory estimates.

**Error Estimate:** Additional information about data integrity is available at: <http://www.epa.gov/otaq/m6.htm>.

**New/Improved Data or Systems:** To keep pace with new analysis needs, new modeling approaches, and new data, EPA is currently working on a new modeling system termed the Multi-scale Motor Vehicles and Equipment Emission System (MOVES). This new system will estimate emissions for on road and off road sources, cover a broad range of pollutants, and allow multiple scale analysis, from fine scale analysis to national inventory estimation. When fully implemented, MOVES will serve as the replacement for MOBILE6 and NONROAD. The new system will not necessarily be a single piece of software, but instead will encompass the necessary tools, algorithms, underlying data and guidance necessary for use in all official analyses associated with regulatory development, compliance with statutory requirements, and national/regional inventory projections. Additional information is available at: <http://www.epa.gov/otaq/ngm.htm>.

**References:** For additional information about mobile source programs see: <http://www.epa.gov/otaq/>.

**FY 2006 Performance Measure: Cumulative percent reduction in the number of days with Air Quality Index (AQI) values over 100 since 2003, weighted by population and AQI value. (PART measure)**

**Performance Databases:** The Air Quality Subsystem (AQS) stores ambient air quality data used to evaluate an area's air quality levels relative to the NAAQS. The AIRNow Data Management System (DMC) stores real-time ambient air quality data used for the sole purpose of reporting real-time AQI and air quality forecasting.

**Data Sources:** State & local agency data from State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS).

**Methods, Assumptions, and Suitability:** Data are gathered from monitors using EPA-approved federal reference and/or equivalent methods, all of which are published via the Federal Register. EPA assumes the collecting agency has properly maintained each monitor and that the data sent to EPA have passed at least an automated QA/QC check. The monitoring networks have been providing data for decades and the data are considered highly reliable. In addition these data form the basis of EPA's attainment decisions, trend analysis, and health impact assessments.

**QA/QC Procedures:** For AQS, the QA/QC of the national air monitoring program has several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, EPA's National Performance Audit Program (NPAP), system audits, and network reviews (Available at: [www.epa.gov/ttn/amtic/npaplist.html](http://www.epa.gov/ttn/amtic/npaplist.html)). To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and site criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and record keeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections. Further information available at: <http://www.epa.gov/cludygxb/programs/namslam.html> and through United States EPA's Quality Assurance Handbook (EPA-454/R-98-004 Section 15).

For DMC, the QA/QC procedures at each State, local, Tribal, or Federal agency are the same as documented above. Because the DMC handles real-time data, additional QA/QC data checks are built into the data flow process to further guard against erroneous values being passed through the system. Data in the DMC are not considered final and are not used for any regulatory purpose. Data in the AQS system are the official values used for regulatory analyses.

**Data Quality Review:** For AQS, no external audits have been done in the last 3 years. However, internal audits are regularly conducted. For DMC, no external audits have been done in the last 3 years. However, internal audits are regularly conducted and data are routinely processed by external users where applicable.

**Error Estimate:** At this time it is not possible to develop an error estimate. There is still too much uncertainty in the projections and near term variations in air quality (due to meteorological conditions for example) exist.

**New/Improved Data or Systems:** In January 2002, EPA completed the reengineering of AQS to make it a more user friendly, Windows-based system. As a result, air quality data are more easily accessible via the Internet. AQS has also been enhanced to comply with the Agency's data standards (e.g., latitude/longitude, chemical nomenclature). Beginning in July 2003, agencies submitted air quality data to AQS thru the Agency's Central Data Exchange (CDX).

CDX is intended to be the portal through which all environmental data coming to or leaving the Agency will pass.

For DMC, the AIRNow Data Management Center was redesigned in 2004 to more efficiently handle additional pollutants and provide for easier access to real-time data. In addition, automated QA/QC procedures were updated and increased flexibility for state/local agencies to update information was included.

**References:** For additional information about criteria pollutant data, non-attainment areas, and other related information, see: <http://www.epa.gov/airtrends/>. For more information on the monitoring network, as well as reference and equivalent methods, see the Ambient Monitoring Technology Information Center (AMTIC) at: <http://www.epa.gov/ttn/amtic>. For information on the AIRNow real-time program, see: <http://www.airnow.gov/>.

**FY 2006 Performance Measures:**

- **Percent of significant Title V operating permit revisions issued within 18 months of receiving a complete permit application. (PART measure)**
- **Percent of new Title V operating permits issued within 18 months of receiving a complete permit application. (PART measure)**

**Performance Databases:** TOPS (Title V Operating Permit System).

**Data Sources:** Permitting Agencies (State and Local) via EPA Regional Offices.

**Methods, Assumptions, and Suitability:** The performance measure is calculated by comparing the number of new permits or significant permit modifications issued during past 18 months to the total number of new permits or significant permit modifications received during the same period. Data are collected every 6 months. There are no underlying assumptions in the development of this measure.

**QA/QC Procedures:** Some data quality checks include: 1) making sure the number of permits issued in 18 months is equal to or less than the total number of permits received. 2) ensuring the percentages seem reasonable compared to previous reporting periods, and 3) making sure clock does not restart when additional information is submitted after the application is received.

**Data Quality Review:** Same as QA procedures.

**New/Improved Data or Systems:** TOPS has been revised and improved for 2006 to ensure better consistency between states and to specifically track PART measures.

**References:** For additional information about criteria pollutant data, non-attainment areas, and other related information, see: <http://www.epa.gov/airtrends/>.

**FY 2006 Performance Measures: Percent of major NSR permits issued within one year of receiving a complete permit application. (PART measure)**

**Performance Databases:** RBLC (RACT (Reasonably Available Control Technology) BACT (Best Available Control Technology) LAER (Lowest Achievable Emissions Rate) Clearinghouse)

**Data Sources:** Permitting Agencies (State and Local).

**Methods, Assumptions, and Suitability:** The performance measure is calculated by determining the time period between the date of complete permit application and permit issuance. The percentage represents the number of major NSR permits issued within one year of complete application to the total number of permits issued within that same period. There are no underlying assumptions in the development of this performance measure.

**QA/QC Procedures:** Some data quality checks include: 1) making sure the permit issuance dates are after the complete permit application dates and appear reasonable, 2) ensuring the permit processing times are similar for comparable permits in previous reporting periods and 3) making sure the time period does not restart when additional information is submitted after the application is received.

**References:** For additional information about criteria pollutant data, non-attainment areas, and other related information, see: <http://www.epa.gov/airtrends/>.

## **GOAL 1 OBJECTIVE 2**

**FY 2006 Performance Measures: Office Workers experiencing improved indoor air quality in their workplaces.**

**Performance Database:** Since fiscal year 1999 and each fiscal year thereafter, the performance database consists of the annual number of requested copies of building indoor air quality guidance documents, (e.g. EPA's Building Air Quality, I-Beam, a computer software designed to be a comprehensive state-of-the-art guidance for managing IAQ in commercial buildings, Mold Remediation in Schools and Commercial Buildings) and training conducted through cooperative agreements or other government agencies (GSA) using EPA documents. In addition, EPA conducted a voluntary pilot survey of building owners and managers in 2001 to determine the use of indoor air quality (IAQ) management practices in U.S. office buildings.

**Data Source:** The pilot survey was developed by EPA and distributed by the Building Owners and Managers Association (BOMA). The pilot survey's purpose and design received approval from the Office of Management and Budget. The survey is not administered on an annual basis.

**Methods, Assumptions and Suitability:** The pilot survey included data regarding: the size and uses of a selected building; documentation of management practices employed in the building; how the heating, ventilating, and air-conditioning systems are managed; how pollution sources are addressed; housekeeping and pest management practices; remodeling and renovation activities; and responses to tenant complaints regarding IAQ. A sampling frame was developed based upon random sampling of the membership lists from BOMA, the International Facilities Managers Association (IFMA) and buildings managed by the General Services Administration (GSA). The final sample size, (and survey recipient list) was 3,612 and we received 591 completed surveys. The survey results identified both strengths and weaknesses in building management practices in U.S. office buildings.

End-of-year performance is a best professional estimate using all data sources. The survey provides more statistically sound results for one period of time.

**QA/QC Procedures:** Survey was designed in accordance with approved Agency procedures. Additional information is available at: <http://www.epa.gov/icr/players.html/> last accessed 12/22/2004. The quality review was conducted by BOMA.

**Data Quality Review:** BOMA had responsibility for the accuracy of data entered into the database. Quality assurance safeguards were used in the data entry. BOMA, and EPA's contractor reviewed individual survey responses for accuracy during the aggregation and analyses activities.

**Data Limitations:** The primary limitation associated with basing estimates on requests for guidance documents and training is the unknown factor of how many of the requests resulted in improved indoor air quality. The survey provided a reference point on progress. The survey results are subject to the limitations inherent in survey sampling. The response rate of 14 percent for the survey was low due to the timing of the survey administration and subsequent events in September and October 2001.

**Error Estimate:** 4 percent precision at a 95 percent confidence level.

**FY 2006 Performance Measure: Number of additional homes (new and existing) with radon reducing features. (PART measure)**

**Performance Database:** Annual industry survey data of home builders provided by the National Association of Home Builders.

**Data Source:** The survey is an annual sample of home builders in the United States most of whom are members of the National Association of Home Builders (NAHB). NAHB members construct 80 percent of the homes built in the United States each year. Using a survey methodology reviewed by EPA, NAHB Research Center estimates the percentage of these homes that are built radon resistant. The percentage built radon resistant from the sample is then used to estimate what percent of all homes built nationwide are radon resistant. To calculate the number of people living in radon resistant homes, EPA assumes an average of 2.67 people per household. NAHB Research Center has been conducting this annual builder practices survey for over a decade, and has developed substantial expertise in the survey's design, implementation, and analysis. The statistical estimates are typically reported with a 95 percent confidence interval.

**Methods, Assumptions, and Suitability:** NAHB Research Center conducts an annual survey of home builders in the United States to assess a wide range of builder practices. NAHB Research Center voluntarily conducts this survey to maintain an awareness of industry trends in order to improve American housing and to be responsive to the needs of the home building industry. The annual survey gathers information such as types of houses built, lot sizes, foundation designs, types of lumber used, types of doors and windows used, etc. The NAHB Research Center Builder Survey also gathers information on the use of radon-resistant design features in new houses, and these questions comprise about two percent of the survey questionnaire.

In January of each year, the survey of building practices for the preceding calendar year is typically mailed out to home builders. For the most-recently completed survey, for building practices during calendar year 2003, NAHB Research Center reported mailing the survey to about 45,000 active United States home building companies, and received about 2,300 responses, which translates to a response rate of about 5 percent. The survey responses are analyzed, with respect to State market areas and Census Divisions in the United States, to assess the percentage and number of homes built each year that incorporate radon-reducing features. The data are also used to assess the percentage and number of homes built with radon-reducing features in high radon potential areas in the United States (high risk areas).

Other analyses include radon-reducing features as a function of housing type, foundation type, and different techniques for radon-resistant new home construction. The data are suitable for year-to-year comparisons.

**QA/QC Procedures:** Because data are obtained from an external organization, QA/QC procedures are not entirely known. According to NAHB Research Center, QA/QC procedures have been established, which includes QA/QC by the vendor that is utilized for key entry of data.

**Data Quality Review:** Because data are obtained from an external organization, Data Quality Review procedures are not entirely known. NAHB Research Center indicates that each survey is manually reviewed, a process that requires several months to complete. The review includes data quality checks to ensure that the respondents understood the survey questions and answered the questions appropriately. NAHB Research Center also applies checks for open-ended questions to verify the appropriateness of the answers. In some cases, where open-ended questions request numerical information, the data are capped between the upper and lower three percent of the values provided in the survey responses. Also, a quality review of each year's draft report from NAHB Research Center is conducted by the EPA project officer.

**Data Limitations:** The majority of home builders surveyed are NAHB members. The NAHB Research Center survey also attempts to capture the activities of builders that are not members of NAHB. Home builders that are not members of NAHB are typically smaller, sporadic builders that in some cases build homes as a secondary profession. To augment the list of NAHB members in the survey sample, NAHB Research Center sends the survey to home builders identified from mailing lists of builder trade publications, such as Professional Builder magazine. There is some uncertainty as to whether the survey adequately characterizes the practices of builders who are not members of NAHB. The effects on the findings are not known.

Although an overall response rate of 5 percent could be considered low, it is the response rate for the entire survey, of which the radon-resistant new construction questions are only a very small portion. Builders responding to the survey would not be doing so principally due to their radon activities. Thus, a low response rate does not necessarily indicate a strong potential for a positive bias under the speculation that builders using radon-resistant construction would be more likely to respond to the survey. NAHB Research Center also makes efforts to reduce the potential for positive bias in the way the radon-related survey questions are presented.

**Error Estimate:** See Data Limitations

**References:** The results are published by the NAHB Research Center in annual reports of radon-resistant home building practices. See <http://www.nahbrc.org/> last accessed 12/21/2005 for more information about NAHB. The most recent report, "Builder Practices Report: Radon Reducing Features in New Construction 2003," Annual Builder and Consumer Practices Surveys by the NAHB Research Center, Inc., November, 2004. Similar report titles exist for prior years.

**FY 2006 Performance Measure: Percent of public that is aware of the asthma program's media campaign. (PART measure)**

**Performance Database:** A media tracking study used to assess behavior change within that sector of the public viewing the public service announcements.

**Data Source:** An independent initiative of the Advertising Council provides media tracking of outcomes of all their public service campaigns and this is publicly available information.

**Methods, Assumptions and Suitability, QA/QC Procedures, Data Quality Review, Data Limitations, New/Improved Data or Systems:** Methods are those of the Advertising Council, and not controlled by EPA.

**References:** Advertising Council Reporting. EPA Assistance Agreement number X-82820301. For additional information see the Ad Council web site <http://www.adcouncil.org/> last accessed 12/21/05.

**FY 2006 Performance Measure: Additional health care professionals trained annually by EPA and its partners on the environmental management of asthma triggers. (PART measure)**

**Performance Database:** The performance database consists of quarterly Partner status reports used to document the outcomes of individual projects.

**Data Source:** Partner status reports are generated by those organizations receiving funding from EPA and are maintained by individual EPA Project Officers.

**Methods, Assumptions and Suitability:** On an annual basis, EPA requires (programmatic terms and conditions of the award) all funded organizations to provide reports identifying how many health care professionals are educated about indoor asthma triggers.

**QA/QC Procedures:** It is assumed that organizations report data as accurately and completely as possible; site-visits are conducted by EPA project officers.

**Data Quality Review:** Project officers review data quality.

**New/Improved Data or Systems:** EPA is exploring the development of a centralized data base.

**FY 2006 Performance Measure: Additional health care professionals trained annually by EPA and its partners on the environmental management of asthma triggers. (PART measure)**

**Performance Database:** The performance database consists of quarterly Partner status reports used to document the outcomes of individual projects.

**Data Source:** Partner status reports are generated by those organizations receiving funding from EPA and are maintained by individual EPA Project Officers.

**Methods, Assumptions and Suitability:** On an annual basis, EPA requires (programmatic terms and conditions of the award) all funded organizations to provide reports identifying how many health care professionals are educated about indoor asthma triggers.

**QA/QC Procedures:** It is assumed that organizations report data as accurately and completely as possible; site-visits are conducted by EPA project officers.

**Data Quality Review:** Project officers review data quality.

**New/Improved Data or Systems:** EPA is exploring the development of a centralized data base.

**FY 2006 Performance Measure: Estimated annual number of schools establishing Indoor Air Quality programs based on EPA's Tools for Schools guidance. (PART measure)**

**Performance Database:** EPA collects national data by conducting a survey of indoor air quality management practices in schools approximately every three years. The first survey was administered in 2002. EPA is partnering with CDC to incorporate IAQ management practice indicators, consistent with the benchmark survey, into the School Health Policies and Programs Study (SHPPS) to be administered in 2006. EPA will implement this IAQ module as a smaller survey in 2009, as the SHPPS survey is only conducted at 6 year intervals.

To measure annual progress, EPA estimates the number of schools who establish IAQ Tools for Schools (TfS) programs each year from reports from partner organizations and regional recruiters, supplemented by tracking the volume of guidances distributed and number of people trained by EPA and its partners. EPA also collects information on program benefits such as reduced school nurse visits, improved workplace satisfaction among staff, reduced absenteeism, and cost savings experienced by schools.

**Data Source:** The sources of the data include cooperative partners, USEPA and the statistical sample of all the public and private schools in the nation during the 1999 – 2000 school year (118,000); data are from the United States Department of Education National Center for Education Statistics.

**Methods, Assumptions and Suitability:** Calculations for the number of people experiencing improved IAQ are based upon an average 525 students, staff and faculty per school (data are from the United States Department of Education National Center for Education Statistics). That number, along with the number of schools that are adopting/implementing TfS, are used to estimate the performance result.

End-of-year performance is a best professional estimate using all data sources. The survey provides more statistically sound results for one period of time; the next scheduled survey will provide performance results for year 2006. EPA's 2006 survey will be included as part of CDC's 2006 School Health Policies and Programs Study, which is conducted every six years.

**QA/QC Procedures:** It is assumed that partner organizations report data as accurately and completely as possible; site visits and regular communication with grantees are conducted by EPA projects officers.

**Data Quality Review:** EPA reviews the data from all sources in the performance database to ascertain reliability and to resolve any discrepancies.

**Data Limitations:** The primary limitation associated with Cooperative Agreement Partner status reporting is the error introduced as a result of self-reporting.

**New/Improved Data or Systems:** Prior to the 2002 survey, EPA tracked the number of schools receiving the TfS guidance and estimated the population of the school to determine the number of students/staff experiencing improved indoor air quality. The survey was administered to establish a baseline for schools implementing IAQ management practices. EPA queried a statistically representative sample of schools to estimate the number of schools that have actually adopted and implemented good IAQ management practices consistent with the TfS

guidance. EPA plans to re-administer the survey as a component of CDC's School Health Policies and Programs Study, which will show progress from the baseline.

**References:** See the United States Department of Education National Center for Education Statistics, <http://nces.ed.gov/> last accessed 12/21/2005. See also Indoor Air Quality Tools for Schools Kit (402-K-95-001) at <http://www.epa.gov/iaq/schools> last accessed 12/21/2005 and see [www.cdc.gov/nccdphp/dash/shpps/](http://www.cdc.gov/nccdphp/dash/shpps/) For additional information about the School Health Policies and Programs Study (SHPPS), a national survey periodically conducted to assess school health policies and programs at the state, district, school, and classroom levels.

### **GOAL 1 OBJECTIVE 3**

#### **FY 2006 Performance Measure: Remaining US consumption of HCFCs, measured in tons of ozone depleting potential (ODP). (PART measure)**

**Performance Database:** The Allowance Tracking System (ATS) database is maintained by the Stratospheric Protection Division (SPD). ATS is used to compile and analyze quarterly information on U.S. production, imports, exports, transformations, and allowance trades of ozone-depleting substances (ODS).

**Data Source:** Progress on restricting domestic exempted consumption of Class II HCFCs is tracked by monitoring industry reports of compliance with EPA's phase-out regulations. Data are provided by U.S. companies producing, importing, and exporting ODS. Corporate data are typically submitted as quarterly reports. Specific requirements as outlined in the Clean Air Act are available on the Internet at: <http://www.epa.gov/oar/caa/caa603.txt>. Monthly information on domestic production, imports, and exports from the International Trade Commission is maintained in the ATS.

**Methods, Assumptions and Suitability:** Data are aggregated across all U.S. companies for each individual ODS to analyze U.S. total consumption and production.

**QA/QC Procedures:** Reporting and record-keeping requirements are published in 40 CFR Part 82, Subpart A, Sections 82.9 through 82.13. These sections of the Stratospheric Ozone Protection Rule specify the required data and accompanying documentation that companies must submit or maintain on-site to demonstrate their compliance with the regulation.

The ATS data are subject to a Quality Assurance Plan (Quality Assurance Plan, USEPA Office of Atmospheric Programs, July 2002). In addition, the data are subject to an annual quality assurance review, coordinated by Office of Air and Radiation (OAR) staff separate from those on the team normally responsible for data collection and maintenance. The ATS is programmed to ensure consistency of the data elements reported by companies. The tracking system flags inconsistent data for review and resolution by the tracking system manager. This information is then cross-checked with compliance data submitted by reporting companies. SPD maintains a user's manual for the ATS that specifies the standard operating procedures for data entry and data analysis. Regional inspectors perform inspections and audits on-site at the producers', importers', and exporters' facilities. These audits verify the accuracy of compliance data submitted to EPA through examination of company records.

**Data Quality Reviews:** The Government Accounting Office (GAO) completed a review of U.S. participation in five international environmental agreements, and analyzed data submissions

from the U.S. under the Montreal Protocol on Substances that Deplete the Ozone Layer. No deficiencies were identified in their January 2003 report.

**Data Limitations:** None, since companies are required by the Clean Air Act to report data. EPA's regulations specify a quarterly reporting system.

**New/Improved Data or Systems:** The Stratospheric Protection Division is developing a system to allow direct electronic reporting.

**References:** See <http://www.epa.gov/ozone/desc.html> for additional information on ODSs. See <http://www.unep.ch/ozone/montreal.shtml> for additional information about the Montreal Protocol. See <http://www.unmfs.org/> for more information about the Multilateral Fund. Quality Assurance Plan, USEPA Office of Atmospheric Programs, July 2002

**FY 2006 Performance Measure: Cumulative federal dollars spent per cumulative number of schools joining the SunWise program.**

**Data Source:** Cumulative federal dollars spent is estimated from annual program budget tracking documents. The number of schools joining the SunWise program is measured by counting the number of schools that register to join the SunWise program in each year, which is collected at <http://www.epa.gov/sunwise/becoming.html>. Schools also have the option of sending in a paper registration, which EPA then enters at this website. EPA tracks the data at <http://intranet.epa.gov/sunwise/viewdata.html>.

**Methods, Assumptions and Suitability:** The cumulative number of schools joining the SunWise program is measured by counting the number of schools that register to join the SunWise program in each year, which is collected at <http://www.epa.gov/sunwise/becoming.html>, and adding the incremental number of schools joining the program to the prior year's cumulative total. The efficiency measure is calculated by dividing the cumulative number of dollars EPA has spent on the SunWise program by the cumulative number of schools that have joined the program.

**QA/QC Procedures:** All registrations by schools are reviewed by EPA staff for completeness and to assure there is no double counting of entries. EPA updates the registration information during the course of program implementation.

**Data Quality Reviews:** Each year researchers at an independent contractor contact a statistical sample of schools in the program database in order to evaluate the effectiveness of the program. EPA updates the website based on the contractor's findings as appropriate.

**Data Limitations:** The number of participating schools is probably underestimated since schools that fail to provide full registration information are not entered into the database, even if they participate in the program. Note that additional organizations besides schools may also register and provide the SunWise curriculum. These organizations include scout troupes, camps, and 4-H groups, for example. Therefore, counting only schools underestimates the program's reach and efficiency.

**References:** For more information about the SunWise School program, see: <http://www.epa.gov/sunwise/> and <http://www.epa.gov/sunwise/becoming.html>. Data collection regarding schools that participate in SunWise is authorized by OMB Control No. 2060-0439.

## GOAL 1 OBJECTIVE 4

### **FY 2006 Performance Measure: Purchase and Deploy State-of-Art Monitoring Units.**

**Performance Data:** Data from the near real-time gamma component of the RadNet, formerly known as the Environmental Radiation Ambient Monitoring System (ERAMS), will be stored in an internal EPA database at the National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama. Data from filters are housed in the Laboratory Information Management System (LIMS) which are physically located in Montgomery, Alabama.

**Data Source:** RadNet

**Methods, Assumptions and Suitability:** Assuming that funding is continued in future years and the project receives all necessary approvals, the existing air sampling equipment will be supplemented with state-of-the art air monitors that include near real-time gamma radiation detection capability. Addition of detectors and communication systems will provide information about significant radioactive contamination events to decision-makers within hours.

**QA/QC Procedures:** Quality Assurance and Quality Control Procedures will follow the Agency guidelines and be consistent with a specific initial operational Quality Assurance Plan that will be completed. All monitoring equipment will be periodically calibrated with reliable standards and routinely checked for accuracy with onsite testing devices. Laboratory analyses of air filters and other environmental media are closely controlled in compliance with the NAREL Quality Management Plan and applicable Standard Operating Procedures.

**Data Quality Reviews:** The database will screen all incoming data from the monitoring systems for abnormalities as an indicator of either a contamination event or an instrument malfunction. Data will be held in a secure portion of the database until verified by trained personnel. Copies of quality assurance and quality control testing will also be maintained to assure the quality of the data.

**Data Limitations:** Data are limited in near-real-time to gamma emitting radionuclide identification and quantification. Radiation levels from gamma-emitting nuclides that will be so low as to be “undetectable” will be significantly below health concerns that require immediate action. Lower levels of radioactive materials in the samples will be measured through laboratory-based analyses and data.

**Error Estimate:** The overall error in detection capability is estimated to be within 50 percent of the actual concentration based on previous experience with similar measurement systems. An error analysis will be performed on the prototype systems during the process of detector selection.

**New/Improved Performance Data or Systems:** New air samplers will maintain steady flow rates that are measured during operation and corrected for varying environmental conditions. Addition of gamma spectrometric detectors and computer-based multi-channel analyzers to the air samplers provide near real-time analyses of radioactive content in particles captured by the filter. In addition to data collection, the onboard computer systems can communicate results of analyses back to a central database and even identify abnormal conditions that might require action. These improvements not only include higher quality data, but also will provide information regarding contamination events to decision-makers within hours instead of days.

The number and location of monitoring sites will be improved to provide greater coverage of more of the nation's population.

The plan for upgrading and expanding the RadNet air monitoring network was reviewed in FY05 by an EPA Technical Evaluation Panel (TEP) and will be reviewed in FY06 by the Radiation Advisory Committee (RAC) of EPA's Science Advisory Board (SAB). The TEP review provided a number of comments that were incorporated in the RadNet plan, especially those addressing the refinement of the overall system objectives. The SAB review is expected to provide discussion and guidance from a team of national experts that will address key aspects of the science and technology of the new network, including fundamental concerns such as the appropriateness and potential effectiveness of the plan for siting near-real-time air monitors across the nation.

**References:** For additional information about the continuous monitoring system, ERAMS see: <http://www.epa.gov/narel/radnet> last accessed 7/27/2005.

NAREL Quality Management Plan, Revision 1, March 15, 2001.

**FY 2006 Performance Measure: Percentage of EPA RERT members that meet criteria.**

**Performance Data:** To determine the effectiveness of RERT performance, an output measure has been developed that scores RERT members on a scale of one (1) to 100 against criteria developed based on the RERT's responsibilities under the National Response Plan's Nuclear/Radiological Incident Annex (formerly the Federal Radiological Emergency Response Plan) and the National Oil and Hazardous Substances Pollution Contingency Plan (the NCP). A baseline evaluation was performed in FY03, based on the effectiveness of the RERT in responses to actual incidents and a major national exercise (TOPOFF2). RERT members were evaluated in their ability to: (1) provide effective field response, (2) support coordination centers, and (3) provide analytical capabilities and to support a single small-to-medium scale incident, as needed. Overall RERT effectiveness in this baseline analysis was measured at approximately 13 percent. In FY 2004, RERT members were re-evaluated, through a major exercise, in the ability factors listed above. In FY 2005, the evaluation criteria have been reevaluated and revised in response to the results of the FY 2004 exercise as well as changes necessitated by the Homeland Security Act of 2002 and DHS' issuance of the National Incident Management System (NIMS) and the National Response Plan.

**Data Source:** Based on the requirements of EPA set forth in the NRP's Nuclear/Radiological Incident Annex and the NCP, EPA has developed criteria against which the capabilities of the RERT are judged. This evaluation has been performed by members of the Radiation Protection Division, including representatives both within and outside the RERT itself.

**Data Limitations:** The evaluation criteria were modified between FY2003 and FY2005 to reflect the changing requirements of the RERT, based on DHS' issuance of both NIMS and the NRP during this time period. While the broad outline of the RERT's role has remained the same, additional requirements have been imposed by the issuance of these documents, which are now reflected in the RERT evaluation criteria.

**References:** The Homeland Security Act of 2002, the National Incident Management System, and the National Response Plan.

**FY 2006 Performance Measure: Drums of Radioactive Waste Disposed of according to**

## **EPA Standards.**

**Performance Data:** The Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) database contains the number of drums shipped by DOE waste generator facilities and placed in the DOE WIPP. The WIPP is a DOE facility located in southeastern New Mexico, 26 miles from Carlsbad, New Mexico. The WIPP Land Withdrawal Act was passed by Congress in October 1992 and amended in September 1996. The act transferred the land occupied by the WIPP to DOE and gave EPA, regulatory responsibility for determining whether the facility complies with radioactive waste disposal standards. Through July 2005, EPA has completed over 97 on-site inspections to evaluate waste prior to shipment to the WIPP facility.

**Data Source:** Department of Energy

**QA/QC Procedures:** The performance data used by EPA are collected and maintained by DOE. Under EPA's WIPP regulations (available at: <http://www.epa.gov/radiation/wipp/background.htm> (last accessed 7/18/200), all DOE WIPP-related data must be collected and maintained under a comprehensive quality assurance program meeting consensus standards developed by the American Society of Mechanical Engineers (ASME) (available on the Internet: <http://www.asme.org/codes> (last accessed 7/18/2005) ). EPA conducts regular inspections to ensure that these quality assurance systems are in place and functioning properly; no additional QA/QC of the DOE data is conducted by EPA.

**Data Limitations:** The DOE WIPP database contains the number of drums shipped by DOE waste generator facilities and placed in the DOE WIPP. Currently, there are five DOE waste generator facilities that are approved to generate and ship waste: Los Alamos National Laboratory, Rocky Flats Environmental Technology Site, Hanford Site, Idaho National Engineering and Environmental Laboratory, Savannah River Site.

Before DOE waste generator facilities can ship waste to the WIPP, EPA must approve the waste characterization controls and quality assurance procedures for waste identification at these sites. EPA conducts frequent independent inspections and audits at these sites to verify continued compliance with radioactive waste disposal standards and to determine if DOE is properly tracking the waste and adhering to specific waste component limits. Once EPA gives its approval, the number of drums shipped to the WIPP facility on an annual basis is dependent on DOE priorities and funding. EPA volume estimates are based on projecting the average shipment volumes over 40 years with an initial start up.

**References:** The Department of Energy National TRU Waste Management Plan Quarterly Supplement [http://www.wipp.ws/library/caolib.htm#Controlled\\_](http://www.wipp.ws/library/caolib.htm#Controlled_) (last accessed 7/18/2005) contains information on the monthly volumes of waste that are received at the DOE WIPP.

## **GOAL 1 OBJECTIVE 5**

### **FY 2006 Performance Measures:**

- **Million metric tons of carbon equivalent (mmtce) of greenhouse gas emissions reduced in the building sector. (PART measure)**
- **Million metric tons of carbon equivalent (mmtce) of greenhouse gas emissions reduced in the industry sector. (PART measure)**

- **Million metric tons of carbon equivalent (mmtce) of greenhouse gas emissions reduced in the transportation sector. (PART measure)**

**Performance Database:** Climate Protection Partnerships Division Tracking System. The tracking system's primary purpose is to maintain a record of the annual greenhouse gas emissions reduction goals and accomplishments for the voluntary climate program using information from partners and other sources. It also measures the electricity savings and contribution towards the President's greenhouse gas intensity goal.

**Data Source:** EPA develops carbon and non-CO<sub>2</sub> emissions baselines. A baseline is the "business-as-usual" case" without the impact of EPA's voluntary climate programs. Baseline data for carbon emissions related to energy use comes from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model (IPM) of the U.S. electric power sector. These data are used for both historical and projected greenhouse gas emissions and electricity generation, independent of partners' information to compute emissions reductions from the baseline and progress toward annual goals. The projections use a "Reference Case" for assumptions about growth, the economy, and regulatory conditions. Baseline data for non-carbon dioxide (CO<sub>2</sub>) emissions, including nitrous oxide and other high global warming potential gases, are maintained by EPA. The non-CO<sub>2</sub> data are compiled with input from industry and also independently from partners' information.

Data collected by EPA's voluntary programs include partner reports on facility- specific improvements (e.g. space upgraded, kilowatt-hours (kWh) reduced), national market data on shipments of efficient products, and engineering measurements of equipment power levels and usage patterns.

Baseline information is discussed at length in the U.S. Climate Action Report 2002. The report includes a complete chapter dedicated to the U.S. greenhouse gas inventory (sources, industries, emissions, volumes, changes, trends, etc.). A second chapter addresses projected greenhouse gases in the future (model assumptions, growth, sources, gases, sectors, etc.).

U.S. Department of State. 2002. "U.S. Climate Action Report—2002. Third National Communication of the United States of America under the United Nations Framework Convention on Climate Change."

Partners do contribute *actual* emissions data biannually after their facility-specific improvements but these emissions data are not used in tracking the performance measure. EPA, however, validates the estimates of greenhouse gas reductions based on the actual emissions data received.

**Methods, Assumptions, and Suitability:** Most of the voluntary climate programs' focus is on energy efficiency. For these programs, EPA estimates the expected reduction in electricity consumption in kilowatt-hours (kWh). Emissions prevented are calculated as the product of the kWh of electricity saved and an annual emission factor (e.g., metric tons carbon equivalent (MMTCE) prevented per kWh). Other programs focus on directly lowering greenhouse gas emissions (e.g., Natural Gas STAR, Landfill Methane Outreach, and Coalbed Methane Outreach); for these, greenhouse gas emission reductions are estimated on a project-by-project basis. EPA maintains a tracking system for emissions reductions.

The Integrated Planning Model, used to develop baseline data for carbon emissions, is an important analytical tool for evaluating emission scenarios affecting the U.S. power sector. The IPM has an approved quality assurance project plan that is available from EPA's program office.

**QA/QC Procedures:** EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from voluntary programs. Peer-reviewed carbon-conversion factors are used to ensure consistency with generally accepted measures of greenhouse gas (GHG) emissions, and peer-reviewed methodologies are used to calculate GHG reductions from these programs.

Partners do contribute *actual* emissions data biannually after their facility-specific improvements but these emissions data are not used in tracking the performance measure. EPA, however, validates the estimates of greenhouse gas reductions based on the actual emissions data received.

**Data Quality Review:** The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. The second such interagency evaluation, led by the White House Council on Environmental Quality, examined the status of U.S. climate change programs. The review included participants from EPA and the Departments of State, Energy, Commerce, Transportation, and Agriculture. The results were published in the *U.S. Climate Action Report-2002* as part of the United States' submission to the Framework Convention on Climate Change (FCCC). The previous evaluation was published in the *U.S. Climate Action Report-1997*. A 1997 audit by EPA's Office of the Inspector General concluded that the climate programs examined "used good management practices" and "effectively estimated the impact their activities had on reducing risks to health and the environment..."

**Data Limitations:** These are indirect measures of GHG emissions (carbon conversion factors and methods to convert material-specific reductions to GHG emissions reductions). Also, the voluntary nature of the programs may affect reporting. Further research will be necessary in order to fully understand the links between GHG concentrations and specific environmental impacts, such as impacts on health, ecosystems, crops, weather events, and so forth.

**Error Estimate:** These are indirect measures of GHG emissions. Although EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from its voluntary programs, errors in the performance data could be introduced through uncertainties in carbon conversion factors, engineering analyses, and econometric analyses. The only programs at this time aimed at avoiding GHG emissions are voluntary.

**New/Improved Data or Systems:** The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. EPA continues to update inventories and methodologies as new information becomes available.

**References:** The U.S. Climate Action Report 2002 is available at: [www.epa.gov/globalwarming/publications/car/index.html](http://www.epa.gov/globalwarming/publications/car/index.html). The accomplishments of many of EPA's voluntary programs are documented in the Climate Protection Partnerships Division Annual Report. The most recent version is *Protecting the Environment Together: ENERGY STAR and other Voluntary Programs*, Climate Protection Partnerships Division 2003 Annual Report.

**FY 2006 Performance Measure: Annual Energy Savings.**

**Performance Database:** Climate Protection Partnerships Division Tracking System.

**Data Source:** Data collected by EPA's voluntary programs include partner reports on facility specific improvements (e.g. space upgraded, kilowatt-hours (kWh) reduced), national market data on shipments of efficient products, and engineering measurements of equipment power levels and usage patterns.

**Methods, Assumptions, and Suitability:** Most of the voluntary climate programs' focus is on energy efficiency. For these programs, EPA estimates the expected reduction in electricity consumption in kilowatt-hours (kWh). Emissions prevented are calculated as the product of the kWh of electricity saved and an annual emission factor (e.g., MMTCE prevented per kWh). Other programs focus on directly lowering greenhouse gas emissions (e.g., Natural Gas STAR, Landfill Methane Outreach, and Coalbed Methane Outreach); for these, greenhouse gas emission reductions are estimated on a project-by-project basis. EPA maintains a tracking system for energy reductions.

Energy bill savings are calculated as the product of the kWh of energy saved and the cost of electricity for the affected market segment (residential, commercial, or industrial) taken from the Energy Information Administration's (EIA) *Annual Energy Outlook* and *Annual Energy Review* for each year in the analysis (1993-2013). Energy bill savings also include revenue from the sale of methane and/or the sale of electricity made from captured methane. The net present value (NPV) of these savings was calculated using a 4-percent discount rate and a 2001 perspective.

**QA/QC Procedures:** EPA devotes considerable effort to obtaining the best possible information on which to evaluate energy savings from its voluntary programs.

**Data Quality Review:** The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. The second such interagency evaluation, led by the White House Council on Environmental Quality, examined the status of U.S. climate change programs. The review included participants from EPA and the Departments of State, Energy, Commerce, Transportation, and Agriculture. The results were published in the *U.S. Climate Action Report-2002* as part of the United States' submission to the Framework Convention on Climate Change (FCCC). The previous evaluation was published in the *U.S. Climate Action Report-1997*. A 1997 audit by EPA's Office of the Inspector General concluded that the climate programs examined "used good management practices" and "effectively estimated the impact their activities had on reducing risks to health and the environment..."

**Data Limitations:** The voluntary nature of programs may affect reporting. In addition, errors in the performance data could be introduced through uncertainties in engineering analyses and econometric analyses.

**Error Estimate:** Although EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from voluntary programs, errors in the performance data could be introduced through uncertainties in engineering analyses and econometric analyses.

**New/Improved Data or Systems:** The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. EPA continues to update inventories and methodologies as new information becomes available.

**References:** The U.S. Climate Action Report 2002 is available at: <http://www.epa.gov/globalwarming/publications/car/index.html>. The accomplishments of many of EPA's voluntary programs are documented in the Climate Protection Partnerships Division Annual Report. The most recent version is *Protecting the Environment Together: Energy Star and Other Voluntary Programs*, Climate Protection Partnerships Division 2003 Annual Report.

## **GOAL 1 OBJECTIVE 6**

### **FY 2006 Performance Measure: Fuel Economy of typical SUV with EPA-Developed Hybrid Technology Tested over EPA Driving Cycles.**

**Performance Database:** Fuel economy test data for both urban and highway test cycles under the EPA Federal Test Procedure for passenger cars. The Clean Automotive Technology program commits EPA to develop technology by the end of the decade to satisfy stringent criteria emissions requirements and up to a doubling of fuel efficiency in personal vehicles such as SUVs, pickups, and urban delivery vehicles—while simultaneously meeting the more demanding size, performance, durability, and power requirements of these vehicles.

**Data Source:** EPA fuel economy tests performed at the National Vehicle and Fuel Emissions Laboratory (NVFEL), Ann Arbor, Michigan.

**QA/QC Procedures:** EPA fuel economy tests are performed in accordance with the EPA Federal Test Procedure and all applicable QA/QC procedures. Available on the Internet: <http://www.epa.gov/otaq/sftp.htm>.

**Data Quality Reviews:** EPA's NVFEL laboratory is recognized as a national and international facility for fuel economy and emissions testing. NVFEL is also the reference point for private industry.

**Data Limitations:** Primarily due to EPA regulations, vehicle fuel economy testing is a well established and precise exercise with extremely low test to test variability (well less than 5 percent). Additional information is available on the Internet: <http://www.epa.gov/otaq/testdata.html> One challenge relates to fuel economy testing of hybrid vehicles (i.e., more than one source of onboard power), which is more complex than testing of conventional vehicles. EPA has not yet published formal regulations to cover hybrid vehicles. Relevant information is available on the Internet: [http://www.ctts.nrel.gov/analysis/hev\\_test/procedures.shtml](http://www.ctts.nrel.gov/analysis/hev_test/procedures.shtml).

**New/Improved Data or Systems:** EPA is using solid engineering judgment and consultations with other expert organizations (including major auto companies) to develop internal procedures for testing hybrid vehicles.

**References:** See <http://www.epa.gov/otaq/testproc.htm> for additional information about testing and measuring emissions at the NVFEL.

### **FY 2006 Performance Measures:**

- **Synthesis report with improved data on emissions and ambient concentrations for use in preparation and evaluation of state implementation plan development, application, and compliance determination.**
- **Integrated report on the health effects of different particle sizes or particle components in healthy and select susceptible subgroups.**

**Performance Database:** Program output; no internal tracking system.

## **GOAL 2 OBJECTIVE 1**

### **FY 2006 Performance Measures:**

- **The percentage of the population served by community water systems that receive drinking water that meets all applicable health-based drinking water standards through effective treatment and source water protection. (PART measure)**
- **The percentage of the population served by community water systems that receive drinking water that meets health-based standards with which systems need to comply as of December 2001.**
- **The percentage of the population served by community water systems that receive drinking water that meets health-based standards with a compliance date of January 2002 or later (covered standards include: Stage I disinfection by-products/interim enhanced surface water treatment rule/long-term enhanced surface water treatment rule/arsenic).**
- **The percentage of community water systems that provide drinking water that meets health-based standards with which systems need to comply as of December 2001.**
- **The percentage of community water systems that provide drinking water that meets health-based standards with a compliance date of January 2002 or later.**
- **The percentage of population served by community water systems in Indian country that receive drinking water that meets all applicable health-based drinking water standards.**

**Performance Database:** Safe Drinking Water Information System - Federal Version (SDWIS or SDWIS/FED). SDWIS contains basic water system information, population served, and detailed records of violations of the Safe Drinking Water Act and the statute's implementing regulations. The performance measure is based on the population served by community water systems that were active during any part of the performance year and did not have any violations designated as "health based." Exceedances of a maximum contaminant level (MCL) and violations of a treatment technique are health-based violations. SDWIS has provided annual results for ten years and reports on a fiscal year basis.

**Data Source:** Data are provided by agencies with primacy (primary enforcement authority) for the Public Water System Supervision (PWSS) program. These agencies are either: States, EPA for non-delegated states or territories, and the Navajo Nation Indian tribe, the only tribe with primacy. Primacy agencies collect the data from the regulated water systems, determine compliance, and report a subset of the data to EPA (primarily inventory and summary violations).

**Methods, Assumptions and Suitability:** Under the drinking water regulations, water systems must use approved analytical methods for testing for contaminants. State certified laboratories report contaminant occurrence to states that, in turn, determine exceedances of maximum contaminant levels or non-compliance with treatment techniques and report these violations to EPA. These results are subject to periodic performance audits and compared to results that states report to SDWIS. Primacy agencies' information systems and compliance determinations are audited on an average schedule of once every 3 years, according to a protocol. To measure program performance, EPA aggregates the SDWIS data into national statistics on

overall compliance with health-based drinking water standards using the measures identified above.

**QA/QC Procedures:** EPA conducts a number of Quality Assurance/Quality Control steps to provide high quality data for program use, including:

- (1) SDWIS/FED edit checks built into the software to reject erroneous data.
- (2) Quality assurance manuals for states and Regions, which provide standard operating procedures for conducting routine assessments of the quality of the data, including timely corrective action(s).
- (3) Training to states on reporting requirements, data entry, data retrieval, and error correction.
- (4) User and system documentation produced with each software release and maintained on EPA's web site. System, user, and reporting requirements documents can be found on the EPA web site, <http://www.epa.gov/safewater/>. System and user documents are accessed via the database link <http://www.epa.gov/safewater/databases.html>, and specific rule reporting requirements documents are accessed via the regulations, guidance, and policy documents link <http://www.epa.gov/safewater/regs.html>.
- (5) Specific error correction and reconciliation support through a troubleshooter's guide, a system-generated summary with detailed reports documenting the results of each data submission, and an error code database for states to use when they have questions on how to enter or correct data.
- (6) User support hotline available 5 days a week.

The SDWIS/FED equivalent of a quality assurance plan is the data reliability action plan<sup>1</sup> (DRAP). The DRAP contains the processes and procedures and major activities to be employed and undertaken for assuring the data in SDWIS meet required data quality standards. This plan has three major components: assurance, assessment, and control.

**Data Quality Review:** SDWIS data quality was identified as an Agency weakness in 1999 and has a corrective action completion target date that extends to 2007. SDWIS' weaknesses centered around five major issues: 1) completeness of the data (e.g., the inventory of public water systems, violations of maximum contaminant levels, enforcement actions) submitted by the states, 2) timeliness of the data sent by the states, i.e., if states do not report at specified times, then enforcement and oversight actions suffer, 3) difficulty receiving data from the states, 4) both cost and difficulty processing and storing data in SDWIS after it has been received, and 5) difficulty getting SDWIS data for reporting and analysis.

The first two issues are being addressed over a three-year period (2004-2007) through two (2000 and 2003) Data Reliability Action Plans. OGWDW is now working with the states to complete a 2006 data quality review and plan. An information strategic plan<sup>2</sup> (ISP) was developed and implemented to address the last three issues, which deal primarily with technology (hardware and software) concerns. Implementation of the ISP, which ended in 2005, documents ways to improve tools and processes for creating and transferring data to EPA and incorporates newer

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<sup>1</sup> *Data Reliability Action Plan*. U.S. EPA, October 2002. Office of Ground Water and Drinking Water internal work plan document. *Drinking Water Data Reliability Analysis and Action Plan (2003) For State Reported Public Water System Data In the EPA Safe Drinking Water Information System/Federal Version (SDWIS/FED)*

<sup>2</sup> U.S. EPA, Office of Water, *Office of Ground Water and Drinking Water Information Strategy* (under revision). See *Options for OGWDW Information Strategy (Working Draft)*, EPA 816-P-01-001. Washington, DC, February 2001. Available on the Internet at <http://www.epa.gov/safewater/data/informationstrategy.html>

technologies and adapts the Agency's Enterprise Architecture Plan to integrate data and allow the flow of data from reporting entities to EPA via the Agency's secure central data exchange (CDX) environment.

Routine data quality assurance and quality control (QA/QC) analyses of the Safe Drinking Water Information System (SDWIS) by the Office Water (OW) have revealed a degree of non-reporting of violations of health-based drinking water standards, and of violations of regulatory monitoring and reporting requirements (discussed further under Data Limitations). As a result of these data quality problems, the baseline statistic of national compliance with health-based drinking water standards likely is lower than previously reported. The Agency is more accurately quantifying data quality and should be better able to estimate the impact on national compliance with health-based drinking water standards in the future (2008 and beyond). OGWDW also is working with states to develop a data quality objective for these data to better gauge progress toward data quality improvement. Even as improvements are made, SDWIS serves as the best source of national information on compliance with Safe Drinking Water Act requirements for program management, the development of drinking water regulations, trends analyses, and public information.

**Data Limitations:** Recent state data verification and other quality assurance analyses indicate that the most significant data quality problem is under-reporting by the states of monitoring and health-based standards violations and inventory characteristics. The most significant under-reporting occurs in monitoring violations. Even though those are not covered in the health based violation category, which is covered by the performance measure, failures to monitor could mask treatment technique and MCL violations. Such under-reporting of violations limits EPA's ability to: 1) accurately portray the amount of people affected by health-based violations, 2) undertake geo-spatial analysis, 3) integrate and share data with other data systems, and 4) precisely quantify the population served by systems, which are meeting the health-based standards. Therefore, the estimates of population-served could be high or low. As described in the Data Quality Review section above, EPA is currently changing the protocol to enhance the results of data audits as the best near-term option to improve these estimates, while continuing to explore other approaches, including use of contaminant occurrence data.

**Error Estimate:** EPA will be analyzing data, derived from the improved data audit protocol, with a robust statistical basis from which to extrapolate national results, and better aligned with requirements of the Data Quality Act. The long-term value of the improved audit process is that each year's results will be statistically representative and provide information closer in time to the needed performance reporting; for example, 2006 results, the first year of the improved audit process will be reported in 2007.

**New/Improved Data or Systems:** Several approaches are underway. First, EPA will continue to work with states to implement the DRAP and ISP, which have already improved the completeness, accuracy, timeliness, and consistency of the data in SDWIS/FED through: 1) training courses for specific compliance determination and reporting requirements, 2) state-specific technical assistance, 3) increased number of data audits conducted each year, and 4) assistance to regions and states in the identification and reconciliation of missing, incomplete, or conflicting data.

Second, more states (from 30 to 40 by year-end 2005) will use SDWIS/STATE,<sup>3</sup> a software

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<sup>3</sup> SDWIS/STATE (Version 8.1) is an optional Oracle data base application available for use by states and EPA regions to support implementation of their drinking water programs.

information system jointly designed by states and EPA, to support states as they implement the drinking water program.

Third, EPA has modified SDWIS/FED to (1) simplify the database, (2) minimize data entry options resulting in complex software, (3) enforce Agency data standards, and (4) ease the flow of data to EPA through a secure data exchange environment incorporating modern technologies, all of which will improve the accuracy of the data. In 2006, full use of SDWIS/FED for receiving state reports will be implemented. Data will be stored in a data warehouse system that is optimized for analysis, data retrieval, and data integration from other data sources. It will improve the program's ability to more efficiently use information to support decision-making and effectively manage the program.

Finally, EPA, in partnership with the states, is developing information modules on other drinking water programs: the Source Water Protection Program, the Underground Injection Control Program (UIC), and the Drinking Water State Revolving Fund. These modules will be integrated with SDWIS to provide a more comprehensive data set with which to assess the nation's drinking water supplies, a key component of the goal. Agreement will shortly be reached on the data elements for reporting source water and UIC data. Plans have now been developed for design of systems to address these data flows. Developing the systems to receive the data is scheduled for 2007.

#### **References:**

##### Plans\*

- SDWIS/FED does not have a Quality Assurance Project Plan - it is a legacy system which has "evolved" since the early 80s prior to the requirement for a Plan. The SDWIS/FED equivalent is the Data Reliability Action Plan.
- Information Strategy Plan – SDWIS/FED (see footnote 2).
- Office of Water Quality Management Plan, available at <http://www.epa.gov/water/info.html>.
- Enterprise Architecture Plan.

##### Reports\*

- 1999 SDWIS/FED Data Reliability.
- 2003 SDWIS/FED Data Reliability Report - contains the Data Reliability Action Plan and status report.

##### Guidance Manuals, and Tools:

###### PWSS SDWIS/FED Quality Assurance Manual

Various SDWIS/FED User and System Guidance Manuals (includes data entry instructions, data On-line Data Element Dictionary-a database application, Error Code Data Base (ECDB) - a database application, users guide, release notes, etc.) Available on the Internet at <http://www.epa.gov/safewater/sdwisfed/sdwis.htm>

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U.S. EPA, Office of Ground Water and Drinking Water. Data and Databases. Drinking Water Data & Databases – SDWIS/STATE, July 2002. Information available on the Internet: [http://www.epa.gov/safewater/sdwis\\_st/current.html](http://www.epa.gov/safewater/sdwis_st/current.html)

\* These are internal documents maintained by EPA's Office of Ground Water and Drinking Water. Please call 202-564-3751 for further information.

Regulation-Specific Reporting Requirements Guidance. Available on the Internet at <http://www.epa.gov/safewater/regs.html>

Web site addresses: OGWDW Internet Site <http://www.epa.gov/safewater/databases.html> and contains access to the information systems and various guidance, manuals, tools, and reports. Sites of particular interest are: <http://www.epa.gov/safewater/data/getdata.html> contains information for users to better analyze the data, and <http://www.epa.gov/safewater/sdwisfed/sdwis.htm> contains reporting guidance, system and user documentation and reporting tools for the SDWIS/FED system.

**FY 2006 Performance Measures:**

- **Fund Utilization Rate for the DWSRF.**
- **Number of additional projects initiating operations.**

**Performance Database:** Drinking Water State Revolving Fund National Information Management System (DWNIMS).

**Data Sources:** Data are entered by state regulatory agency personnel and by EPA's Regional staff; they are collected and reported once yearly.

**Methods, Assumptions and Suitability:** Data entered into DWNIMS directly represent the units of performance for the performance measure. These data are suitable for year-to-year comparison and trend indication.

**QA/QC Procedures:** EPA's headquarters and Regional offices are responsible for compiling the data and querying states as needed to assure data validity and conformance with expected trends. States receive data entry guidance from EPA headquarters in the form of annual memoranda (e.g., "2005 DWNIMS Data Collection").

**Data Quality Reviews:** EPA's headquarters and Regional offices annually review the data submitted by the states. State data are publicly available at <http://www.epa.gov/safewater/dwsrf/dwnims.html> in individual state reports. Headquarters addresses significant data variability issues directly with states or through the appropriate EPA Regional office. Additionally, EPA's contractor tests the data for logical consistency. An annual EPA headquarters' "DWNIMS Analysis" provides detailed data categorization and comparison. This analysis is used during:

1. Annual EPA Regional office and state reviews to identify potential problems with the program's pace which might affect the performance measure.
2. Reviews by EPA's headquarters of regional oversight of state revolving funds.
3. Annual reviews by EPA's Regional offices of their states' revolving funds operations.

State data quality is also evaluated during annual reviews performed by EPA Regions. Any inconsistencies that are found in need of correction are incorporated into future DWNIMS reports. These adjustments are historically rare and very minor.

**Data Limitations:** There are no known limitations in the performance data, which states submit voluntarily. Erroneous data can be introduced into the DWNIMS database by typographic or definitional error. Typographic errors are controlled and corrected through data testing performed by EPA's contractor. Definitional errors due to varying interpretations of information requested for specific data fields have been largely reduced. These definitions are publicly

available at: <http://www.epa.gov/safewater/dwsrf/nims/dwdatadefs.pdf>. There is typically a lag of approximately two months from the date EPA asks states to enter their data into the DWNIMS database, and when the data are quality-checked and available for public use.

**New/Improved Data or Systems:** This system has been operative since DWSRF inception. It is updated annually, and data fields are changed or added as needed.

**References:**

State performance data as shown in NIMS are available by state at:

<http://www.epa.gov/safewater/dwsrf/dwnims.html>

Definitions of data requested for each data field in NIMS is available at:

<http://www.epa.gov/safewater/dwsrf/nims/dwdatadefs.pdf>

2005 DWNIMS Data Collection – memo from Jeff Bryan, 7/12/05

DWNIMS analysis

**FY 2006 Performance Measure: Percent of states conducting sanitary surveys at community water systems once every 3 years.**

**Performance Database:** Primary enforcement responsibility (e.g. primacy) for the Public Water System Supervision (PWSS) program is authorized under §1413 of the Safe Drinking Water Act (SDWA). States and Indian Tribes are given primacy for public water systems in their jurisdiction if they meet certain requirements. A critical component of primacy is the requirement that a state must have a program to conduct sanitary surveys of the systems in its jurisdiction. A sanitary survey is an on-site review of the water sources, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of the facilities for producing and distributing safe drinking water. Inspectors conducting sanitary surveys must apply basic scientific information and have a working knowledge of the operation, maintenance, management, and technology of a water system to identify sanitary risks that may interrupt the multiple barriers of protection at a water system. There are eight essential elements of a sanitary survey as defined by the EPA/State Joint Guidance on Sanitary Surveys<sup>4</sup> and the interim enhanced surface water treatment rule: water source; treatment; distribution system; finished water storage; pumps, pump facilities and controls; monitoring, reporting and data verification; water system management and operations; and operator compliance with state requirements.

Performance data for this measure will be compiled from information collected during file audits of randomly selected community water systems (data verification or DV). The purpose of a DV is two-fold: (1) to detect discrepancies between the PWS data in the state files or database and the data reported to SDWIS/FED and (2) to ensure that the State is determining compliance in accordance with EPA approved state regulations. After the conduct of each DV, a report is generated which includes the findings for compliance with sanitary survey requirements. DVs are conducted on a cycle in order to visit each state at a frequency of every three years. Final reports for each state serve as the official data source for this measure until a new DV is conducted. Information derived for the DV reports will be calculated annually for this measure.

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<sup>4</sup> Guidance Manual for Conducting Sanitary Surveys of Public Water Systems; Surface Water and Ground Water Under the Direct Influence (GWUDI), (EPA 815-R-99-016, April 1999)  
<http://www.epa.gov/safewater/mdbp/pdf/sansurv/sansurv.pdf>

**Data Source:** State specific Final Data Verification Reports provide information on compliance with sanitary survey requirements. Information from DV reports for states will be calculated to measure performance.

**Methods, Assumptions and Suitability:** To assure that data collected during a DV is consistently captured and analyzed, the DV team follows the “EPA Protocol for Participation in a PWSS Program Data Verification” which includes revisions through April 4, 2005. The protocol provides guidance on statistical methodology for defining variables, calculating the statistical proportion (P), determining the appropriate sample size and selecting the systems for file review. Before selecting a sample of systems, the DV team must decide whether it wishes to stratify (or sort) the sample by some characteristic. Stratifying the sample permits more precision, allowing the team to make observations about subsets of systems. A sample may be stratified by system type, size, source, or a combination of these factors. For DV purposes, the sample is always stratified by system type (i.e., CWSs, NTNCWSs, and TNCWSs) since different regulations apply to different types of systems. Once the DV team determines the subset of systems from which the sample will be drawn, along with the number of systems which must be reviewed from that subset of systems, the SDWIS/FED random number generator selects the systems for review. Statistical principles dictate that samples must be selected in a truly random fashion in order to obtain unbiased estimates and achieve the desired precision level. For states whose files are kept in one central office, sample selection is straightforward. The SDWIS/FED random number generator pulls a random sample of systems from the entire subset of systems within the state. Hence, all systems have an equal chance of being chosen.

**QA/QC Procedures:** To assure the data collected during a DV is complete and accurate, the DV team follows the “EPA Protocol for Participation in a PWSS Program Data Verification.” This protocol is intended as a “handbook” for people performing a DV. The protocol contains detailed instructions for reviewing and analyzing data for sanitary surveys. Since neither time nor resources allow a complete review of all sanitary survey data, the DV team must use a random sample of systems that is drawn from the total number of systems in each state. This random sample is statistically representative of systems in the state. The team then uses the statistical sampling results to draw reasonably accurate assumptions about all of the systems in the state, based on just a few systems.

**Data Quality Reviews:** Information derived from DVs is captured in a draft report and submitted to EPA (HQ and Regions) as well as the state where the DV was conducted for review. States and EPA conduct data quality reviews and provide additional information or data as necessary to assure accuracy and completeness. EPA works with states to resolve data issues. Reports are finalized and thus used to measure performance.

**Data Limitations:** OGWDW has an existing database for PWSS program information, the Safe Drinking Water Information System (SDWIS). Violations of sanitary survey requirements are captured in SDWIS. However, the data field to record sanitary survey frequency is not a mandatory field. Due to resource limitations, sanitary survey data cannot be verified for every system in every state each year. OGWDW employs a methodology to analyze a representative sample of systems during an audit.

**FY 2006 Performance Measure: Number of households on Tribal lands lacking access to safe drinking water.**

**Performance Database:** Sanitation Tracking and Reporting System (STARS), the Indian Health Service (IHS), Office of Environmental Health and Engineering (OEHE), Division of Sanitation Facilities Construction (DSFC).

**Data Sources:** The STARS includes data on sanitation deficiencies, Indian homes and construction projects. STARS is currently comprised of two sub data systems, the Sanitation Deficiency System (SDS) and the Project Data System (PDS).

The SDS is an inventory of sanitation deficiencies for existing Indian homes and communities. The IHS is required to prioritize SDS deficiencies and annually report to Congress. The identification of sanitation deficiencies can be made several ways, the most common of which follow:

- Consultation with Tribal members and other Agencies
- Field visits by engineers, sanitarians, Community Health Representatives (CHRs) nurses, or by other IHS or tribal health staff
- Sanitary Surveys
- Community Environmental Health Profiles
- Bureau of Indian Affairs (BIA) Inventory
- Census Bureau Reports (for comparison purposes only)
- Tribal Master Plans for Development
- Telephone Surveys
- Feasibility Studies

The most reliable and preferred method is a field visit to each community to identify and obtain accurate numbers of homes with sanitation deficiencies. The number of Indian homes within the communities must be consistent among the various methods cited above. If a field visit cannot be made, it is highly recommended that more than one method be used to determine sanitation deficiencies to increase the accuracy and establish greater credibility for the data.

The PDS is a listing of funded construction projects and is used as a management and reporting tool.

**QA/QC Procedures:** Quality assurance for the Indian country water quality performance measure depends on the quality of the data in the STARS. The STARS data undergoes a series of quality control reviews at various levels within the IHS DSFC. The DSFC is required to annually report deficiencies in SDS to Congress in terms of total and feasible project costs for proposed sanitation projects and sanitation deficiency levels for existing homes.

**Data Quality Reviews:** The SDS data initially undergoes a series of highly organized reviews by experienced tribal, IHS field, IHS district and IHS area personnel. The data are then sent to the DSFC headquarters office for review before final results are reported. The DSFC headquarters reviews the SDS data for each of the 12 IHS area offices. The data quality review consists of performing a number of established data queries and reports which check for errors and/or inconsistencies. In addition, the top 25 SDS projects and corresponding community deficiency profiles for each area are reviewed and scrutinized thoroughly. Detailed cost estimates are highly encouraged and are usually available for review.

**Data Limitations:** The data are limited by the accuracy of reported data in STARS.

**Error Estimate:** The IHS DSFC requires that higher-level projects (those with the possibility of funding prior to the next update) must be developed to allow for program implementation in an organized, effective, efficient manner. Those SDS projects (top 20%) must have cost estimates within 10% of the actual costs.

**New/Improved Data or Systems:** The STARS is a web based application and therefore allows data to be continuously updated by personnel at various levels and modified as program requirements are identified.

**References:** Indian Health Service (IHS), Division of Sanitation Facilities (DSFC). Criteria for the Sanitation Facilities Construction Program, June 1999, Version 1.02, 3/13/2003. [http://www.dsfc.ihs.gov/Documents/Criteria\\_March\\_2003.cfm](http://www.dsfc.ihs.gov/Documents/Criteria_March_2003.cfm); Indian Health Service (IHS), Division of Sanitation Facilities (DSFC). Sanitation Deficiency System (SDS), Working Draft, "Guide for Reporting Sanitation Deficiencies for Indian Homes and Communities", May 2003. <http://www.dsfc.ihs.gov/Documents/SDSWorkingDraft2003.pdf>

**FY 2006 Performance Measure: Percentage of source water areas (both surface and ground water) for community water systems that achieve minimized risk to public health.**

**Performance Database:** The source water assessment and protection programs are authorized under Sections 1453, 1428, and relevant subsections of 1452 of the Safe Drinking Water Act (SDWA).<sup>5</sup> EPA issued guidance to implement these programs in 1997, *State Source Water Assessment and Protection Programs Guidance*.<sup>6</sup> In March 2005, EPA issued supplemental reporting guidance, "State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance." Starting in FY 2005, and updated annually thereafter, states report to EPA on the results of their source water assessment programs (SWAPs) and progress in implementing source water protection (SWP) strategies, and whether such strategy implementation is affecting public health protection. To assess *the results of the SWAPs*, state reporting includes three elements: (1) the delineated source water areas around each well and intake, (2) whether the assessments are complete, and (3) most prevalent and most threatening sources of contamination. To assess *progress in implementing the SWP strategies*, state reporting includes two elements: (1) whether a prevention strategy for Community Water System source water areas has been adopted, and is being implemented and (2) whether such strategy implementation has reached a substantial level. To assess *whether the program is affecting public health protection*, states report change in the number of Community Water System source water areas with substantially implemented source water protection strategies. The Agency will develop a national summary of data on the progress of states' source water protection programs using these data elements in early 2006.

In FY 2003, EPA maintained pilot state-level summary data for each of these elements in a spreadsheet format and this format will be used for reporting for FY 2005. Beginning in FY 2005, states may, at their option, make available to EPA public water system-level data for each of these elements to be maintained in a set of data tables in the drinking water warehouse (for tabular data) and in event tables in the Office of Water's Reach Address Database (RAD)<sup>7</sup> (GIS

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<sup>5</sup> *Safe Drinking Water Act Amendments of 1996*. P.L. 104-182. (Washington: 6 August 1996). Available on the Internet at <<http://www.epa.gov/safewater/sdwa/sdwa.html>>

<sup>6</sup> U.S. EPA, Office of Water. *State Source Water Assessment and Protection Programs Guidance*. EPA 816-R-97-009 (Washington: US EPA, August 1997). Available on the Internet at <<http://www.epa.gov/safewater/swp/swappg.html>>

<sup>7</sup> Watershed Assessment, Tracking & Environmental Results (WATERS). Available only on the Internet at <<http://www.epa.gov/waters/>>

data). These data will be compatible with the inventory data States are currently reporting to the Safe Drinking Water Information System (SDWIS).<sup>8</sup> Three states piloted this approach in 2003.

[Not publicly available. Contact EPA's Drinking Water Protection Division at 202-564-3797.]

**Data Source:** Up to the end of FY 2004, states reported to the EPA Regional Offices the percentage of community water systems implementing source water protection programs. As noted above, states can report to EPA's Regional Offices using a spreadsheet approach. EPA has also developed a new source water data module to collect, store, and use public water system-level data received from states, but it may be refined as more states voluntarily use it over the next three years of the Strategic Plan. - See section "New/Improved Data or Systems."

**Methods, Assumptions and Suitability:** For this measure, the states' reporting of progress in implementing their source water assessment and protection programs will be based on EPA's 2005 guidance, "State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance." States will only report state-level summary information directly related to specific community water systems in a state-level database. While state reporting will be based on definitions and procedures found in the "State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance," and even with the state flexibilities built into the definitions for substantial implementation strategies, EPA believes that the data will be reliable for use in making management decisions.

**QA/QC Procedures:** QA/QC procedures are included in the 2005 "State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance." Additionally, a series of data checks are built into the spreadsheet data collection procedures given to each Region for their work with states. States will be required to identify whether their reported summary-level data are based on a system-level database. EPA Regional offices also will work with individual states to obtain a description of their methods of collecting and verifying information.

**Data Quality Reviews:** EPA Regions will conduct data quality reviews of state data using the QA/QC procedures included with the spreadsheet-based data system, and work with states to resolve data issues. As a result, EPA expects the quality of data on the results of the assessments and source water protection activities to improve over time.

**Data Limitations:** Because the initial reporting provides only state-level summary information, there is no standard protocol for EPA to verify and validate the data against system-level information contained in state databases. In addition, much of the data reported by states is voluntary and based on working agreements with EPA because SDWA only requires states to complete source water assessments. That is, the only source water information that states are required to report to EPA under SDWA is whether the assessments are completed. Although EPA's 2005 "State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance" set standard data definitions and procedures, it also provides for considerable flexibility in states' definition for substantial implementation of strategies, data collection protocols and analytical methods to evaluate their data. For example, some states may require each public water system to report data, while others may institute a voluntary

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<sup>8</sup> Safe Drinking Water Information System (SDWIS). Information available on the Internet at <http://www.epa.gov/safewater/databases.html>

process. Because much of the data reporting is voluntary and the individual state protocols may vary, state data may be incomplete and inconsistent across states.

**Error Estimate:** There is no basis for making an error estimate for this performance measure given the data limitations of state-level summary reporting described above.

**New/Improved Data or Systems:** The source water reporting module has been developed as a joint initiative between EPA, the Association of State Drinking Water Administrators (ASDWA), and the Ground Water Protection Council (GWPC). It will give EPA the ability to access the data directly from states through a data exchange agreement using an electronic data transfer capability. A state may choose, at its option, to provide EPA more detailed data in lieu of state-level summary reporting. The new source water data module will be integrated into the drinking water data warehouse and be compatible with Safe Drinking Water Information System (SDWIS) data already reported by states. Geospatial data (i.e., the intake and well point locations and the source water area polygons) will be maintained in EPA's Office of Water's Reach Access Database (RAD). The source water assessment and protection indicator data and other attribute data will be maintained in data tables in the drinking water warehouse. The source water data module is operational for states to pilot from FY 2005 through FY 2008. Three states used the module in the first pilot year 2003. A number of other states may report using the data module for the 2005 reporting period based on EPA/ASDWA/GWPC pilot process.

#### **References:**

##### Guidance Manuals

- U.S. EPA, Office of Water. *State Source Water Assessment and Protection Programs Guidance*. EPA 816-R-97-009 (Washington: US EPA, August 1997). Available on the Internet at <<http://www.epa.gov/safewater/swp/swappg.html>>
- *Source Water Assessment and Protection Measures: Initial Guidance, August, 2003.*
- "State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance," March 2005.

##### Web site addresses

- US EPA Office of Ground Water and Drinking Water. <<http://www.epa.gov/safewater>>
- For more detailed information on Source Water topics, US EPA Office of Ground Water and Drinking Water, Source Water site. <<http://www.epa.gov/safewater/protect.html>>
- US EPA Office of Water (OW) Reach Access Database (RAD). Watershed Assessment, Tracking & Environmental Results (WATERS). <<http://www.epa.gov/waters/>>
- Safe Drinking Water Information System (SDWIS). <http://www.epa.gov/safewater/databases.html>

**FY 2006 Performance Measure: Percentage of the shellfish-growing acres monitored by states that are approved or conditionally approved for use.**

**Performance Database:** There is no database currently available, although one is under development (see below). In the past, data to support this measure came from surveys of States that are members of the Interstate Shellfish Sanitation Conference (ISSC), conducted at 5-year intervals and periodic updates requested from the Interstate Shellfish Sanitation Conference (most recent, 2003 data released in 2004).

**Data Source:** The ISSC requests the data on approved acreages from shellfish producing states and prepares reports. Survey responses are voluntary.

**Methods, Assumptions and Suitability:** The methods used by the state programs to produce the data used by the ISSC are based on the National Shellfish Sanitation Plan and Model Ordinance; the operation of those state programs is overseen by the FDA.

**QA/QC Procedures:** States are responsible for the internal QA/QC of their data.

**Data Quality Reviews:** The ISSC reviews the state data during report preparation to ensure completeness and accuracy, and follows up with states where necessary.

**Data Limitations:** Based on NOAA's previous surveys and the voluntary nature of the information collected, potential data limitations may include incomplete coverage of shellfish growing areas.

**New/Improved Data or Systems:** The ISSC initiated development of the Shellfish Information Management System (SIMS) in July 2002. The database is being developed and implemented by the National Oceanic and Atmospheric Administration (NOAA) on behalf of the Interstate Shellfish Sanitation Conference (ISSC), a Cooperative Program chartered by the Food and Drug Administration (FDA). The database will include relevant information that is collected by State Shellfish Control Authorities. Historically, NOAA collected shellfish-growing area data in 5-year intervals, 1985, 1990, and 1995. These data were not stored in a database. Once operational, SIMS will be the first national shellfish growing area database and will include NOAA's 1995 and 2003 data. State summary information can then be used to track trends relevant to the performance measure, with the 1995 data as the baseline. The SIMS database is designed as a real time database. The ISSC plans to request data updates annually, but states may update their data any time. These data may be accessed at any time so timely status reports can be generated.

Currently, no long-term database management plan exists.

**FY 2006 Performance Measure:** **The quality of water and sediments will be improved to allow increased consumption of fish in not less than 3 percent of the water miles/acres identified by states or tribes as having a fish consumption advisory in 2002.**

**Performance Database:** National Listing of Fish Advisories.<sup>1</sup> The database includes fields identifying the waters for which fish consumption advisories have been issued. The fields also identify the date upon which the advisory was issued, thus allowing an assessment of trends. The National Hydrographic Data (NHD) are used to calculate the spatial extent of the fish advisory. This information is updated continually as states and tribes issue or revise advisories. The National Listing of Fish Advisories database includes records showing that 846,310 river miles and 14,195,187 lake acres were identified by states or tribes in calendar year 2003 as having fish with chemical contamination levels resulting in an advisory of potential human health risk from consumption. States and tribes report data on a calendar year basis. The calendar year data are then used to support the fiscal year (FY) commitments (e.g., calendar year 2005 data support the FY 2006 commitments). Metadata are also available describing methodologies used by states and tribes for establishing advisories. The Fish Advisory data has been collected since 1993.

**Data Source:** State and Tribal Governments. These entities collect the information and enter it directly into the National Listing of Fish Advisories database. EPA reviews advisory entries, including the states' or tribes' responses to an on-line survey, which support the advisory decision.

**Methods, Assumptions and Suitability:** The performance measure is calculated as the aggregate surface area covered by the individual advisories divided by the total waters of each state or territory. The states and tribes submit the area data to the National Listing of Fish Advisories database.

**QA/QC Procedures:** A standard survey, which has been approved by OMB, is available on the Internet for electronic submission. A password is issued to ensure the appropriate party is completing the survey. EPA has national guidance<sup>2,3</sup> for states and tribes on developing and implementing quality assurance practices for the collection of environmental information related to fish advisories. This guidance helps assure data quality of the information that states and tribes use to decide whether to issue an advisory. The Office of Water's "Quality Management Plan," approved in September 2001 and published in July 2002<sup>4</sup>, is general guidance that applies to information collection.

**Data Quality Reviews:** EPA reviews advisory entries and responses to the survey to ensure the information is complete, then follows-up with the state or local government to obtain additional information where needed. However, the Agency cannot verify the accuracy of the voluntary information that state and local governments provide. There have been no external party reviews of this information.

**Data Limitations:** Participation in this survey and collection of data is voluntary. While the voluntary response rate has been high, it does not capture the complete universe of advisories. Puerto Rico, the Virgin Islands, and Guam do not report in the survey. In addition, states have not assessed all waters for the need for advisories, so the information reported reflects a subset of water bodies in the state.

**Error Estimate:** We are unable to provide an error estimate. Submitting data to the National Listing of Fish Advisories database is voluntary and the Agency cannot be certain that the database contains information on 100% of the assessed waters in the United States. Therefore, we may be understating the total amount of waters assessed, the magnitude of which is not known.

**New/Improved Data or Systems:** EPA will use small grants to encourage states to investigate additional water bodies to determine if there is a need for fish consumption advisories. This will lead to a more complete characterization of the nation's fish safety. EPA also plans to begin tracking recommended "meal frequencies" in the state and tribal advisories to account for the instances where advisories are modified to allow greater consumption.

**References:**

1. U.S. EPA. Office of Water. "National Listing of Fish Advisories." Washington, DC: EPA Accessed May 1, 2003. Available only on the Internet at <http://map1.epa.gov/>
2. U.S. EPA. Office of Water. "Fish Sampling and Analysis." Volume 1 of "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories." 3<sup>rd</sup> ed. EPA-823-B-00-007. Washington DC: EPA, 2000. Available at <http://www.epa.gov/waterscience/fishadvice/volume1/>.
3. U.S. EPA. Office of Water. "Risk Assessment and Fish Consumption Limits." Volume 2

- of "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories." 3<sup>rd</sup> ed. @ EPA-823-B-00-008. Washington DC: EPA, 2000.  
<http://www.epa.gov/waterscience/fishadvice/volume2/>.
4. U.S. EPA. Office of Water. "Quality Management Plan." EPA 821-X-02-001. Washington, DC: EPA, July 2002. Available at  
[http://www.epa.gov/water/programs/qmp\\_july2002.pdf](http://www.epa.gov/water/programs/qmp_july2002.pdf)

**FY 2006 Performance Measure: Percentage of days of the beach season that coastal and Great Lakes beaches monitored by state beach safety programs are open and safe for swimming.**

**Performance Database:** The data are stored in PRAWN (Program tracking, beach Advisories, Water quality standards, and Nutrients), a database that includes fields identifying the beaches for which monitoring and notification information are available and the date the advisory or closure was issued, thus enabling trend assessments to be made. The database also identifies those states that have received a BEACH (Beaches Environmental Assessment and Coastal Health) Act [P.L. 106-284] grant. EPA reports the information annually, on a calendar year basis, each May. The information in the database is accessible to the public through the BEACON (Beach Advisory Closing On-line Notification) system.

**Data Source:** Since 1997 EPA has surveyed state and local governments for information on their monitoring programs and on their advisories or closures. The Agency created the PRAWN database to store this information. State and local governmental response to the survey was voluntary up through calendar year 2002. States and local entities collect and report data on a calendar year basis. The calendar year data are then used to support fiscal year commitments (e.g. 2005 calendar year data are used to report against FY 2006 commitments). Starting in calendar year 2003, data for many beaches along the coast and Great Lakes had to be reported to EPA as a condition of grants awarded under the BEACH Act<sup>1</sup>. As of 2004, States and Territories monitor for pathogens at 3,472 coastal and Great Lakes beaches, up from 2,823 beaches in 2002<sup>2</sup>.

**Methods, Assumptions and Suitability:** The data are an enumeration of the days of beach-specific advisories or closures issued by the reporting state or local governments during the year. Performance against the target is tracked using a simple count of the number of beaches responding to the survey and the days over which the advisory or closure actions were taken. This is compared to the total number of days that every beach could be open. Thus the data are suitable for the performance measure.

**QA/QC Procedures:** Since 1997, EPA has distributed a standard survey form, approved by OMB, to coastal and Great Lake state and county environmental and public health beach program officials in hard copy by mail. The form is also available on the Internet for web-entry electronic submission. When a state or local official enters data using the web-entry format, a password is issued to ensure the appropriate party is completing the survey. Currently the Agency has procedures for information collection (see Office of Water's "Quality Management Plan," approved September 2001 and published July 2002<sup>3</sup>). In addition, coastal and Great Lakes states receiving BEACH Act grants are subject to the Agency's grant regulations under 40 CFR 31.45. These regulations require states and tribes to develop and implement quality assurance practices for the collection of environmental information.

**Data Quality Review:** EPA reviews the survey responses to ensure the information is complete, following up with the state or local government to obtain additional information where

needed. The Agency also reviews the QA/QC reports submitted by States and Territories as part of their grant reporting. There have been no external party reviews of this information.

**Data Limitations:** From calendar year 1997 to calendar year 2002, participation in the survey and submission of data has been voluntary. While the voluntary response rate has been high, it has not captured the complete universe of beaches. The voluntary response rate was 92% in calendar year 2002 (240 out of 261 contacted agencies responded). The number of beaches for which information was collected increased from 1,021 in calendar year 1997 to 2,823 in calendar year 2002. Participation in the survey is now a mandatory condition for implementation grants awarded under the BEACH Act program to coastal and Great Lakes states. Except for Alaska, all coastal and Great Lakes states and territories have annually applied for implementation grants since they have been available.

**Error Estimate:** As of 2004, States and Territories report that they monitor at 3,472 of the 6,099 coastal and Great Lakes beaches. This monitoring varies between States. For example, North Carolina monitors all its 228 beaches whereas South Carolina monitors 24 of 229 beaches. Where monitoring is done, there is some chance that the monitoring may miss some instances of high pathogen concentrations. EPA's most recent National Health Protection Survey of Beaches found that 90% of the nation's beaches are monitored once a week or less<sup>4</sup>. Studies in southern California found that weekly sampling missed 75% of the pathogen exceedances<sup>5</sup>, and that 70% of the exceedances lasted for only one day<sup>6</sup>. An EPA Office of Research and Development (ORD) beach monitoring study found a positive correlation between pathogen indicator densities one day as compared to densities the next day, but that the correlation was negligible when compared to densities after four days<sup>7</sup>. These studies indicate that weekly sampling most likely misses many pathogen events that can affect public health. This information is not sufficient to calculate the potential error in the reporting, but it is sufficient to indicate that the reporting may understate the number of days that beaches should be closed or under advisory.

**New/Improved Data or Systems:** Participation in the survey is now a mandatory condition for grants awarded under the BEACH Act program. As the Agency awards these implementation grants, it will require standard program procedures, sampling and assessment methods, and data elements for reporting. To the extent that state governments apply for and receive these grants, the amount, quality, and consistency of available data will improve. In FY 2006, EPA expects the 35 coastal and Great Lakes states to apply for grants to implement monitoring and notification programs.

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**FY 2006 Performance Measures:**

- **Annual percentage of water body segments identified by States in 2000 as not attaining standards, where water quality standards are now fully attained. (PART measure)**
- **Restore water quality to allow swimming in stream miles and lake acres identified by states.**
- **Cost per water segment restored. (PART measure)**

**Performance Database:** The Watershed Assessment Tracking Environmental Results System (WATERS— found at <http://www.epa.gov/waters/>) is EPA's approach for viewing water quality information related to this measure. WATERS can be used to view "303(d) Information," compiled from, *States' Listings of Impaired Waters as Required by Clean Water Act Section 303(d)* (referred to here in brief as "303(d) lists"), which are recorded in the National Total Maximum Daily Load (TMDL) Tracking System. This information (found at <http://www.epa.gov/owow/tmdl/status.html>) is used to generate reports that identify waters that are not meeting water quality standards ("impaired waters"). This information, combined with information and comment from EPA Regions and states, yields the baseline data for this measure: the number of impaired waters in 1998/2000. As TMDL and other watershed-related activities are developed and implemented, water bodies which were once impaired will meet water quality standards, and thus will be removed from the year 1998/2000 impaired totals. Changes will be recorded in reports, scheduled every six years (e.g. reporting years 2006 and 2012), as percentage improvements to water body impairment.

**Data Source:** The underlying data source for this measure is State 303(d) lists of their impaired water bodies. These lists are submitted with each biennial (calendar year) reporting cycle. The baseline for this measure is the 1998 list (States were not required to submit lists in 2000; however, if states did submit a 2000 list, then that more recent list was used as the baseline). States prepare the lists using actual water quality monitoring data, probability-based monitoring information, and other existing and readily available information and knowledge the state has, in order to make comprehensive determinations addressing the total extent of the state's water body impairments. Once EPA approves a state's 303(d) list, EPA enters the information into WATERS, as described above. Delays are often encountered in state submissions and in EPA's approval of these biennial submissions. Establishing more certain procedures to keep on schedule is being considered.

**Methods, Assumptions, and Suitability:** States employ various analytical methods of data collection, compilation, and reporting including: 1) Direct water samples of chemical, physical, and biological parameters; 2) Predictive models of water quality standards attainment; 3) Probabilistic models of pollutant sources; and 4) Compilation of data from volunteer groups, academic interests and others. EPA-supported models include BASINS, QUAL2E, AQUATOX, and CORMIX. Descriptions of these models and instructions for their use can be found at [www.epa.gov/OST/wqm/](http://www.epa.gov/OST/wqm/). The standard operating procedures and deviations from standard methods for data sampling and prediction processes are stored by states in the STorage and

REtrieval (STORET) database. EPA aggregates state data to generate the national performance measure. State-provided data describe attainment of designated uses in accordance with state water quality standards and thus represent a direct measure of performance. Delays are often encountered in state 303d lists and 305b submissions, and in EPA's approval of the 303(d) portion of these biennial submissions. Establishing more certain procedures to prevent these delays is being considered.

**QA/QC Procedures:** QA/QC of data provided by states pursuant to individual state 303(d) lists (under CWA Section 303(d)) is dependent on individual state procedures. EPA regional staff interacts with the states during the process of approval of the lists and before the information is entered into the database to ensure the integrity of the data. The Office of Water Quality Management Plan (QMP), renewed every five years, was approved in July 2001<sup>9</sup>. EPA requires that each organization prepare a document called a quality management plan (QMP) that: documents the organization's quality policy; describes its quality system; and identifies the environmental programs to which the quality system applies (e.g., those programs involved in the collection or use of environmental data).

**Data Quality Review:** Recent independent reports have cited that weaknesses in monitoring and reporting of monitoring data undermine EPA's ability to depict the condition of the Nation's waters and to support scientifically sound water program decisions. The most recent reports include the 1998 *Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program*<sup>10</sup>, the March 15, 2000 Government Accounting Office report *Water Quality: Key Decisions Limited by Inconsistent and Incomplete Data*<sup>11</sup>, the 2001 National Academy of Sciences Report *Assessing the TMDL Approach to Water Quality Management*<sup>12</sup> and EPA's *Draft Report on the Environment*.<sup>13</sup>

In response to these evaluations, EPA has been working with states and other stakeholders to improve: 1) data coverage, so that state reports reflect the condition of all waters of the state; 2) data consistency to facilitate comparison and aggregation of state data to the national level; and 3) documentation so that data limitations and discrepancies are fully understood by data users.

First, EPA enhanced two existing data management tools (STORET and the National Assessment Database) so that they include documentation of data quality information.

Second, EPA has developed a GIS tool called WATERS that integrates many databases including STORET, the National Assessment Database, and a new water quality standards

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<sup>9</sup> National Research Council, Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction, Water Science and Technology Board, *Assessing the TMDL Approach to Water Quality Management* (Washington, DC: National Academy Press, 2001).

<sup>10</sup> USEPA, National Advisory Council for Environmental Policy and Technology, *Report of the Federal Advisory Committee on the Total Maximum Daily Load Program*. EPA 100-R-09-8006 (1998).

<sup>11</sup> GAO. *Water Quality: Key EPA and State Decisions Limited by Inconsistent and Incomplete Data* (Washington, DC: 2000), RCED-00-54 and *Water Quality: Inconsistent State Approaches Complicate Nation's Efforts to Identify Its Most Polluted Waters*, GAO-02-186 (Washington, DC: 2002)

<sup>12</sup> *Assessing the TMDL Approach to Water Quality Management*. 2001. Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction, Water Science and Technology Board, National Research Council

<sup>13</sup> US EPA, *Draft Report on the Environment 2003*. EPA 260-R-02-006 (2003). Available at <http://www.epa.gov/indicators/roe/index.htm> (accessed 12 December 2005)

database. These integrated databases facilitate comparison and understanding of differences among state standards, monitoring activities, and assessment results.

Third, EPA and states have developed guidance. The 2006 Integrate Report Guidance (released August 3, 2005 at <http://www.epa.gov/owow/tmdl/2006IRG>)<sup>14</sup> provides comprehensive direction to states on fulfilling reporting requirements of Clean Water Act sections 305 (b) and 303(d). Also, the *Consolidated Assessment and Listing Methodology – Toward a Compendium of Best Practices*<sup>15</sup> (released on the Web July 31, 2002 at [www.epa.gov/owow/monitoring/calm.html](http://www.epa.gov/owow/monitoring/calm.html)) intended to facilitate increased consistency in monitoring program design and the data and decision criteria used to support water quality assessments.

Fourth, the Office of Water (OW) and EPA's Regional Offices have developed the *Elements of a State Water Monitoring and Assessment Program*, (August 2002).<sup>16</sup> This guidance describes ten elements that each state water quality monitoring program should contain and proposes time-frames for implementing all ten elements.

In addition, a recent evaluation by the EPA Office of the Inspector General<sup>17</sup> recommended that EPA focus on improving its watershed approach by:

- Facilitating stakeholder involvement in this approach.
- Better integrating the watershed approach into EPA core programs.
- Refining the Agency strategic plan to better evaluate key programs and activities.
- Improving the measurement system by which watershed progress is assessed.

EPA is engaged in many activities to strengthen its footprint in above four foci. Specific examples, as noted in Assistant Administrator Grumbles' December 2005 reply to the Inspector General's evaluation, follow:

First, examples of how the EPA Office of Water is working to facilitate stakeholder involvement in this approach are monthly Webcasts (topics have included strategies, tools, and techniques for sustainable watersheds) and plans to release a Watershed Planning Handbook in 2006.

Second, EPA core program activities are focusing more heartily on watershed initiatives. EPA is preparing 2006 guidance on watershed TMDLs and guidance for using Clean Water State Revolving funds for state watershed activities.

Third, EPA is working to refine its strategic planning process with the April 2005 inception of the Watershed Managers Forum, a channel of communication between EPA Regional offices and

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<sup>14</sup> USEPA, Office of Water, *2006 Guidance for Assessment, Listing, and Reporting Requirements Pursuant to Sections, 303(d), 305(b), and 314 of the Clean Water Act* (2005). Available at <http://www.epa.gov/owow/tmdl/2006IRG> (accessed 12 December 2005)

<sup>15</sup> U.S. EPA, Office of Water, *Consolidated Assessment and Listing Methodology- Toward a Compendium of Best Practices*. (Washington, DC: 2002) Available at [www.epa.gov/owow/monitoring/calm.html](http://www.epa.gov/owow/monitoring/calm.html) (accessed 12 December 2005)

<sup>16</sup> USEPA, Office of Water, *Elements of a State Water Monitoring and Assessment Program*, EPA 841-B-03-003 (Washington, DC: 2003). Available at <http://www.epa.gov/owow/monitoirng/repguide.html> (accessed 12 December 2005)

<sup>17</sup> USEPA Office of the Inspector General, *Sustained Commitment Needed to Further Advance the Watershed Approach* (2005). Available at <http://www.epa.gov/oig/reports/2005/20050921-2005-P-00025.pdf>.

Headquarters on issues, planning, and organizational steps to successfully implement watershed initiatives of EPA's *Strategic Plan*<sup>18</sup>. The Office of Water is also strengthening linkage of its information technology capabilities and monitoring efforts to meet goals of EPA's strategic planning.

Fourth, EPA is working to improve measurement of its progress by conducting detailed analysis of options for measuring performance. Areas of general interest in this effort include tracking improvements short of full restoration, and measures for the extensive work the Office of Water does to maintain water quality.

**Data Limitations:** Data may not precisely represent the extent of impaired waters because states do not employ a monitoring design that monitors all their waters. States, territories and tribes collect data and information on only a portion of their water bodies. States do not use a consistent suite of water quality indicators to assess attainment of water quality standards. For example, indicators of aquatic life use support range from biological community assessments to levels of dissolved oxygen to concentrations of toxic pollutants. These variations in state practices limit how the CWA Sections 305(b) reports and the 303(d) lists provided by states can be used to describe water quality at the national level. There are also differences among their programs, sampling techniques, and standards.

State assessments of water quality may include uncertainties associated with derived or modeled data. Differences in monitoring designs among and within states prevent the agency from aggregating water quality assessments at the national level with known statistical confidence. States, territories, and authorized tribes monitor to identify problems and typically lag times between data collection and reporting can vary by state.

**New/Improved Data Systems:** The Office of Water has been working with states to improve the guidance under which 303(d) lists are prepared. EPA issued new listing guidance entitled *Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* during summer 2005. The Guidance is a comprehensive compilation of relevant guidance EPA has issued to date regarding the Integrated Report. There are a few specific changes from the 2004 guidance. For example, the 2006 Integrated Report Guidance provides greater clarity on the content and format of those components of the Integrated Report that are recommended and required under Clean Water Act sections 303(d), 305(b), and 314. The guidance also gives additional clarity and flexibility on reporting alternatives to TMDLs for attaining water quality standards (e.g., utilization of reporting Category 4b).

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<sup>18</sup> USEPA, Office of the Chief Financial Officer, *2003-2008 Strategic Plan: Direction for the Future*, (2003). Available at <http://www.epa.gov/ocfo/plan/2003sp.pdf> (accessed 16 December 2005).

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## **GOAL 2 OBJECTIVE 2**

### **FY 2006 Performance Measure: Fund utilization rate for the CWSRF.**

**Performance Database:** Clean Water State Revolving Fund National Information Management System (NIMS).

**Data Sources:** Data are from reporting by municipal and other facility operators, state regulatory agency personnel and by EPA's regional staff. Data are collected and reported once yearly.

**Methods, Assumptions and Suitability:** Data entered into NIMS are the units of performance. These data are suitable for year-to-year comparison and trend indication.

**QA/QC Procedures:** EPA's headquarters and regional offices are responsible for compiling the data and querying states as needed to assure data validity and conformance with expected trends. States receive data entry guidance from EPA headquarters in the form of annual memoranda.

**Data Quality Reviews:** EPA's headquarters and regional offices annually review the data submitted by the states. These state data are publicly available at <http://www.epa.gov/owm/cwfinance/cwsrf> in individual state reports. EPA's headquarters

addresses significant data variability issues directly with states or through the appropriate EPA regional office. An annual EPA headquarters' "NIMS Analysis" provides detailed data categorization and comparison. This analysis is used during annual EPA regional office and state reviews to identify potential problems which might affect the performance measure, biennial reviews by EPA's headquarters of regional oversight of state revolving funds and, annual reviews by EPA's regional offices of their states' revolving funds operations.

State data quality is also evaluated during annual audits performed by independent auditors or by the appropriate regional office of the EPA Inspector General. These audits are incorporated into EPA headquarters' financial management system.

**Data Limitations:** There are no known limitations in the performance data, which states submit voluntarily. Erroneous data can be introduced into the NIMS database by typographic or definitional error. Typographic errors are controlled and corrected through data testing performed by EPA's contractor. Definitional errors due to varying interpretations of information requested for specific data fields have been virtually eliminated in the past two years as a result of EPA headquarters' clarification of definitions. These definitions are publicly available at: <http://www.epa.gov/owm/cwfinance/cwsrf>. There is typically a lag of approximately two months from the date EPA asks states to enter their data into the NIMS database, and when the data are quality-checked and available for public use.

**Error Estimate:** Due to the rapid growth of this program, past estimates of annual performance (relative to a target), compared to actual performance data received two years later, have been accurate to an average of approximately plus or minus 2 percentage points.

**New/Improved Data or Systems:** This system has been operative since 1996. It is updated annually, and data fields are changed or added as needed.

**References:**

State performance data as shown in NIMS are available by state at:

<http://www.epa.gov/owm/cwfinance/cwsrf>

Definitions of data requested for each data field in NIMS is available at:

<http://www.epa.gov/owm/cwfinance/cwsrf>

The Office of Water Quality Management Plan, July 2001 (approved September 28, 2001) addresses the quality of data in NIMS. Not publicly available.

**FY 2006 Performance Measures: Watersheds in which at least 80 percent of the assessed water segments meet water quality standards.**

**Performance Database:** The Watershed Assessment Tracking Environmental Results System (WATERS) (1) is used to summarize water quality information at the watershed level. For purposes of this national summary, watersheds are equivalent to 8-digit hydrologic unit codes (HUCs), of which there are 2,262 nationwide although data may be disaggregated to smaller watersheds should the need arise. WATERS is a geographic information system that integrates many existing databases including the STORage and RETrieval (STORET) database (2), the National Assessment Database (NAD)(3), and the Water Quality Standards database (4). Water quality information available through WATERS includes data submitted by the states under Clean Water Act (CWA) Section 305(b) reports. Data from the NAD includes waterbody type, location, extent, and the designated uses assessed, as well as the assessment conclusion. NAD data are available for most areas as far back as the year 2000 assessment

cycle. Data gaps expected include incomplete state assessments and uncertain state adoption of the data formats inconsistent with the National Assessment Database. The data are submitted to EPA every two years, with annual electronic updates. The U.S. EPA provides access to the states' data on its Monitoring Program website. (5)

**Data Source:** State CWA Section 305(b) reports. Under the Clean Water Act, the states are given the responsibility for setting water quality standards for their waters and collecting the data and information to assess the condition of those waters. The data collected by states to assess water quality and to prepare their CWA Section 305(b) reports come from multiple sources, e.g., state monitoring networks, United States Geological Survey (USGS), local governments, volunteer monitors, academic institutions, etc. States also use predictive tools, such as landscape and water quality models, and randomized probability surveys. (Raw water quality data may be entered by states and other sources into STORET.) States use ambient monitoring data to determine if their waters are attaining the state's water quality standards. States are encouraged to use three EPA data systems to structure and transfer these data. The first of these is the Water Quality Standards Database, which records the designated uses and supporting criteria for specifically defined waterbody segments contained in the second dataset, the National Hydrography Dataset (NHD). These segments, each defined by states, are described using a structure that EPA conceived two decades ago, but now has divested to its partner, the U.S. Geological Survey; The NHD provides important address points that can define the extent (for instance, by defining the upstream and downstream boundaries of a beach) of waterbodies that have been assigned consistent standards. The NHD also allows important features such as outfalls, intakes, and dams to be located so that they can be mapped and better understood. It also allows administrative designations to be located, such as the boundaries of assessments made to determine whether the waters meet the standards assigned to a waterbody. Results of assessments are entered into the third database, the National Assessment Database. The National Assessment Database is used to assemble performance statistics for each biennial (calendar year) reporting cycle: 2000, 2002, 2004 and (planned) 2006. Results are calculated on the basis of these biennial reports. Long delays are often encountered in state submissions, causing delays in EPA's development of summary statistics. EPA is working to establish more certain procedures to prevent future delays.

EPA provides access to WATERS on its monitoring website. However, given differences among state water quality standards and monitoring methods, the results of these assessments do not provide a reliable nationwide assessment of water quality conditions.

**Methods, Assumptions and Suitability:** States employ various methods to make water quality assessment decisions, including: 1) Direct sampling of chemical, physical, and biological parameters using targeted site selection (usually, where problems are most likely or where water is heavily used); 2) Predictive models to estimate water quality; 3) Sampling at statistically valid, probability-based sites (in its early stages in a number of states) to assess broad scale water quality conditions; 4) Compilation of data from outside sources such as volunteer monitors, academic institutions, and others. EPA aggregates state assessment information by watershed (as described above) to generate the national performance measure. State assessment results describe attainment of designated uses in accordance with state water quality standards and represent a direct measure of performance. State CWA Section 305(b) data have been used to provide a summary of the ambient water quality conditions across the nation and to determine conditions in the subset of waters assessed. Geographically specific waterbody assessments are suitable for year- to-year comparisons of water quality attainment progress. As states continue to strengthen their monitoring and data management programs, more state data will be suitable for tracking changes in water quality over time. While

programs are in transition, national performance data will be heavily influenced by changes in state data procedures.

**QA/QC Procedures:** QA/QC of data provided by states in their individual assessments (under CWA Section 305(b)) and accessed through WATERS is dependent on individual state procedures. Numerous system level checks are built into the data sources in WATERS, based upon the business rules associated with the water quality standards database. States are given the opportunity to review the information to ensure it accurately reflects the data they submitted. Data exchange guidance and training are also provided to the states. Sufficiency threshold for inclusion in this measure requires that 20 percent of stream miles in an 8-digit HUC be assessed. The Office of Water Quality Management Plan (QMP), renewed every five years, was approved in July 2002 (6). It describes the quality system used by the Office of Water and applies to all environmental programs within the Office of Water and to any activity within those programs that involves the collection or use of environmental data.

**Data Quality Review:** Numerous independent reports have cited that weaknesses in water quality monitoring and reporting undermine EPA's ability to depict the condition of waters nationwide, to make trend assessments, and to support scientifically sound water program decisions. The most recent reports include the 2004 GAO report on watershed management. General Accounting Office (GAO), 2004, *Watershed Management: Better coordination of data collection efforts needed to support key decisions*: Washington D.C., United States General Accounting Office, the 1998 *Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program* (7), the March 15, 2000 General Accounting Office report *Water Quality: Key Decisions Limited by Inconsistent and Incomplete Data* (8), the 2001 National Academy of Sciences Report, *Assessing the TMDL Approach to Water Quality Management* (9), a 2002 National Academy of Public Administration Report, *Understanding What States Need to Protect Water Quality* (10), and *EPA's Draft Report on the Environment* (11). Water quality reporting under Section 305(b) has been identified as an Agency-Level weakness under the Federal Managers Financial Integrity Act.

In response to these evaluations, EPA has been working with states and other stakeholders to improve: 1) data coverage, so that state reports reflect the condition of all waters of the state; 2) data consistency, to facilitate comparison and aggregation of state data to the national level; and 3) documentation, so that data limitations and discrepancies are fully understood by data users.

The Office of Water has limited authority to require better water quality monitoring or reporting by states. OW has recently issued several guidance documents designed to increase consistency and coverage in state monitoring, assessment and reporting. In July 2003, EPA issued its Integrated Reporting guidance (12) which calls on states to integrate the development and submission of 305(b) water quality reports and Section 303(d) lists of impaired waters. The Integrated Report will enhance the ability of water quality managers to display, access, and integrate environmental data and information from all components of the water quality program. In July 2002, EPA released the *Consolidated Assessment and Listing Methodology - a Compendium of Best Practices* (13), intended to facilitate increased consistency in monitoring program design and in the data and decision criteria used to support water quality assessments. And in March 2003, EPA issued *Elements of a State Water Monitoring and Assessment Program* (14), which describes ten elements that each state water quality monitoring program should contain and a ten-year time frame for implementing all elements. As part of each state's monitoring strategy, state data will be accompanied by quality assurance plans. Quality assurance is one of the ten required elements of these strategies.

EPA has enhanced two existing data management tools (STORET and the National Assessment Database) so that they include documentation of data quality information. EPA's WATERS tool integrates many databases including STORET, the National Assessment Database, and the Water Quality Standards Database. These integrated databases facilitate comparison and understanding of differences among state standards, monitoring activities, and assessment results. The Office of Water has recently convened and continues to use an Assessment Data Visualization Work Group that is tracking the increased use of the three data systems and is planning to focus its orientation and training to expand the use of these data systems and to ensure regional review of the quality of states' data. Regions also will more closely review the coverage of monitoring needed to support state assessment activities. Until there is consistent, widespread use of these systems, the water quality conditions states report will be subject to procedure-induced variation that masks environmental progress.

**Data Limitations:** Data do not represent an assessment of water quality conditions at the national level. EPA is working with states to provide a data structure that allows state assessments to be geographically located so that they can be clearly identified and changes can be tracked over time. EPA data systems being adopted by states implement this feature. Other disparities remain, however. Most states do not employ a monitoring design that characterizes all waters in each reporting cycle, and some states only report the results of the most recent assessments without providing the perspective of water quality from previous assessments. States, territories, and tribes collect data and information on only a portion of their water bodies because it is prohibitively expensive to monitor all water bodies. Furthermore, states do not use a consistent suite of water quality indicators to assess attainment with water quality standards. For example, indicators of aquatic life use support range from biological community condition to levels of dissolved oxygen and concentrations of toxic pollutants. State water quality standards themselves vary from state to state. State assessments of water quality may include uncertainties associated with their measured or modeled data. These variations in state practices and standards limit the use of assessment reports for describing water quality at the national level and prevent the agency from aggregating water quality assessments at the national level with known statistical confidence.

**New/Improved Data or Systems:** The Office of Water is currently working with states, tribes and other Federal agencies to improve the data that support this management measure by addressing the underlying methods of monitoring water quality and assessing the data. Also, the Office of Water is working with partners to enhance monitoring networks to achieve comprehensive coverage of all waters, use a consistent suite of core water quality indicators (supplemented with additional indicators for specific water quality questions), and document key data elements, decision criteria and assessment methodologies in electronic data systems. The Office of Water is using a variety of mechanisms to implement these improvements including data management systems, guidance, stakeholder meetings, training and technical assistance, program reviews and negotiations.

EPA is working with states to enhance their monitoring and assessment programs, and promoting the use of probability surveys as a cost-effective way to obtain a snapshot of water quality conditions. These enhancements, along with improving the quality and timeliness of data for making watershed-based decisions, will improve EPA's ability to use state assessments in portraying national conditions and trends. Specific state refinements include developing biological criteria to measure the health of aquatic communities (and attainment with the aquatic life use) and designing probability-based monitoring designs to support statistically valid inferences about water quality. EPA has been instrumental in helping states design the

monitoring networks and analyze the data. Initial efforts have focused on coastal/estuarine waters and wadeable streams. Lakes will be targeted next. States are implementing these changes incrementally and in conjunction with traditional targeted monitoring. At last count, 16 states have adopted probability-based monitoring designs, several more are evaluating them, and all but 10 are collaborating with EPA to undertake a national probability survey of conditions of wadeable streams at a national level.

The President's FY2005 budget request includes a \$17 million increase to support states' implementation of comprehensive water quality monitoring strategies, including refinement of biological assessment methods and probability-based designs for different water resource types; landscape models and other predictive tools; remote sensing and innovative indicators of water quality to help streamline where additional monitoring is needed; and targeted monitoring to provide data to implement local management actions such as National Pollution Discharge Elimination Program (NPDES) permits and Total Maximum Daily Loads (TMDLs). The initiative will also support improvement of data management systems to ensure that water quality monitoring data are understandable and available to decision makers and the public. Included here are upgrades to STORET, to improve system navigation and operation and to enhance analysis and presentation applications. Funds will also support enhancing the capability to exchange water quality data with states.

#### References:

1. WATERS available on-line at [www.epa.gov/waters](http://www.epa.gov/waters). Aggregate national maps and state and watershed specific data for this measurement are displayed numerically and graphically in the WATERS database.
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12. U.S. EPA, Office of Water, Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act, TMDL, July 21, 2003. Available at <http://www.epa.gov/owow/tmdl/policy.html>.
13. U.S. EPA, Office of Water. "Consolidated Assessment and Listing Methodology. Toward a Compendium of Best Practices." (First Edition). Washington, DC: July 31, 2002. Available at [www.epa.gov/owow/monitoring/calm.html](http://www.epa.gov/owow/monitoring/calm.html).
14. U.S. EPA, Office of Water. *Elements of a State Water Monitoring and Assessment Program*. Washington, DC: March 2003. EPA 841-B-03-003. Available at: [www.epa.gov/owow/monitoring](http://www.epa.gov/owow/monitoring)
15. General Accounting Office *Watershed Management: Better Coordination of Data Collection Efforts Needed to Support Key Decisions*, Washington, DC: March 15, 2000. GAO-04-382

**FY 2006 Performance Measures:**

- **Number of TMDLs that are established or approved by EPA on schedule consistent with national policy (cumulative). (PART measure)**
- **Number of TMDLs that are established by States and approved by EPA on a schedule consistent with national policy (cumulative). (PART measure)**

**Performance Database:** The National Total Maximum Daily Load (TMDL) Tracking System (NTTS) is a database which captures water quality information related to this measure. Watershed Assessment Tracking Environmental Results System (WATERS— found at <http://www.epa.gov/waters/>) is EPA's approach for viewing water quality information related to this measure. TMDL information (found at <http://www.epa.gov/owow/tmdl/status.html>) is used to generate reports that identify waters for which EPA has approved state-established TMDLs and for which EPA has established TMDLs. Annual TMDL totals, spanning 1996 to the present, are available from NTTS on a fiscal year basis. As TMDLs and other watershed-related activities are developed and implemented, water bodies which were once impaired will meet water quality standards. Thus these TMDL measures are closely tied to the PART measure, "Number of water body segments identified by States in 2002 as not attaining standards, where water quality standards are now fully attained." Restored water bodies will be removed from the list of impaired water segments.

**Data Source:** State-submitted and EPA-approved TMDLs and EPA-established TMDLs are the underlying data for this measure. Electronic and hard copies are made available by states and often linked to EPA Web sites. More specifically, WATERS allows search for TMDL documents at [http://www.epa.gov/waters/tmdl/tmdl\\_document\\_search.html](http://www.epa.gov/waters/tmdl/tmdl_document_search.html).

**Methods, Assumptions, and Suitability:** State and EPA TMDLs are thoroughly and publicly reviewed during their development. Upon approval by EPA, relevant information from each TMDL is entered into the NTTS by EPA Regional staff.

**QA/QC Procedures:** QA/QC of data is provided by EPA Regional staff and through cross-checks of WATERS information regarding impaired water listings. The Office of Water Quality Management Plan (QMP), renewed every five years, was approved in July 2001. EPA requires that organizations prepare a document called a QMP that: documents the organization's quality policy; describes its quality system; and identifies the environmental programs to which the quality system applies (e.g., those programs involved in the collection or use of environmental data).

**Data Quality Review:** Internal reviews of data quality have revealed some errors in data and issues associated with the definition of certain database fields. In 2005 and 2006, EPA convened a meeting of NTTS users to discuss how to improve the database. As a result, data field definitions were clarified, the users' group was reinstated, several training sessions were scheduled, and a new National Assessment and TMDL Tracking System workgroup is currently strategizing to improve the database (see "Data Limitations," below).

In addition, a recent EPA Office of the Inspector General report included comments on the TMDL Program (*Sustained Commitment Needed to Further Advance the Watershed Approach*). The report recognized "EPA has integrated principles of the watershed approach into the Total Maximum Daily Load (TMDL) Program by encouraging States to develop TMDLs on a watershed basis rather than by individual water segments. Stakeholder involvement with TMDLs is critical for both the conventional and watershed approaches, but the broader watershed approach may expand the number of stakeholders. Expanding both the geographic scale and the number of stakeholders may result in additional time and resources required to develop these TMDLs." This demand for resources is challenging to overcome in the current budget environment. The EPA Office of Water has formed a Sustainable Finance Team to increase the capacity of local watershed groups and increase awareness of funding possibilities for watershed work, both from within EPA and outside of the Agency. Finally, the evaluation report states, "regardless of the approach taken for development of TMDLs, the regulatory requirements of the Clean Water Act must be met." Current realization of targets shows the TMDL Program continues to make sizable steps in meeting Clean Water Act goals despite the challenges. EPA plans to evaluate the sufficiency of NTTS in handling watershed-based TMDLs given the increase in the use of this approach.

**Data Limitations:** There are usually no gaps in the fields required to identify the TMDLs; however, a number of the fields in NTTS are optional, and population of these fields is erratic. To meet the increasing need for readily accessible CWA information, EPA established a National Assessment and TMDL Tracking System (NATTS) workgroup. This workgroup will fashion an integrated system capable of documenting and managing the connections between state assessment and listing decisions reported under sections 305(b) and 303(d) (i.e., integrated reporting). This system will allow seamless access to all information about assessment decisions and restoration actions across reporting cycles and over time until water quality standards are attained. The integrated system will have streamlined data entry requirements and an understandable interface for both EPA and the public. The system will also be able to support automated transactions with State assessment tracking systems through the EPA Central Data Exchange.

**New/Improved Data Systems:** See above.

**References:** USEPA, Office of the Inspector General. 2005. *Sustained Commitment Needed to Further Advance the Watershed Approach*. Available at <http://www.epa.gov/oig/reports/2005/20050921-2005-P-00025.pdf>.

National Research Council, Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction. 2001. *Assessing the TMDL Approach to Water Quality Management*. Washington, DC: National Academy Press.

**FY 2006 Performance Measure: Percentage of major NPDES permittees in Significant Noncompliance at any time during the fiscal year. (PART measure)**

**Performance Databases:** The Permit Compliance System, (PCS) tracks permit compliance and enforcement data for sources permitted under the Clean Water Act National Pollutant Discharge Elimination System (NPDES). Data in PCS include major permittee self reported data contained in Discharge Monitoring Reports (DMR), data on permittee compliance status, data on state and EPA inspection and enforcement response.

**Data Source:** Permittee self reported DMR data are entered into PCS by either state or EPA Regional offices. PCS automatically compares the entered DMR data with the pollutant limit parameters specified in the facility NPDES permit. This automated process identifies those facilities which have emitted effluent in excess of permitted levels. Facilities are designated as being in Significant Noncompliance (SNC) when reported effluent exceedances are 20 percent or more above permitted levels for toxic pollutants and/or 40 percent or more above permitted levels of conventional pollutants. PCS contains additional data obtained through reports and on-site inspections, which are used to determine SNC, including: non-effluent limit violations such as unauthorized bypasses, unpermitted discharges, and pass through of pollutants which cause water quality or health problems; permit schedule violations; non-submission of DMRs; submission of DMRs 30 or more days late; and violation of state or federal enforcement orders.

**Methods, Assumptions and Suitability:** There are established computer algorithms to compare DMR effluent data against permitted effluent levels. The algorithms also calculate the degree of permitted effluent exceedance to determine whether toxic/conventional pollutant SNC thresholds have been reached.

**QA/QC Procedures:** Quality Assurance/Quality Control procedures (See references) are in place for PCS data entry. State and regional PCS data entry staff are required to take PCS training courses (See references). Quality Management Plans (QMPs) are prepared for each Office within The Office of Enforcement and Compliance Assurance (OECA). The Office of Compliance (OC) has established extensive processes for ensuring timely input, review and certification of PCS information. OC's QMP, effective for 5 years, was approved July 29, 2003 by the Office of Environmental Information (OEI) and is required to be re-approved in 2008.

**Data Quality Review:** Information contained in PCS is required by policy to be reviewed by regional and headquarters staff for completeness and accuracy. SNC data in PCS are reviewed quarterly.

**Data Limitations:** Legal requirements for permittees to self report data on compliance with effluent parameters in permits generally results in consistent data quality and accuracy. EPA monitors and measures the timeliness of DMR submissions and data entry quality. National trends over the past several years show an average of 94 percent of DMRs are entered timely and complete. Where data entry problems are observed, OECA works directly with regions and states to improve performance, and in limited circumstances has dedicated supplemental grant resources to help regions and states correct problems. As part of ICIS-NPDES implementation OECA is working to deploy an electronic DMR process to save resources on data entry workload and reduce data input errors.

**New/Improved Data or Systems:** PCS was developed during the 1980's and has undergone periodic revision and upgrade since then. OECA is currently developing a modernized data system to replace PCS, utilizing modern data entry, storage, and analytical approaches. The replacement of PCS with ICIS-NPDES (Integrated Compliance Information System – NPDES), a modernized and user-friendly NPDES data system, began in June 2006 when eleven states began using the system; seven other states will be migrated to the new system in August.

During phased implementation of ICIS-NPDES across the states a combination of PCS and ICIS-NPDES will be used to generate SNC data. Once fully implemented, ICIS-NPDES will be the sole source of NPDES SNC data.

**FY 2006 Performance Measures:**

- **Number of (a) States and Territories, and (b) authorized Tribes, that within the preceding three year period submitted new or revised water quality criteria acceptable to EPA that reflect new scientific information from EPA or other sources not considered in the previous standards. (PART measure)**
- **Percentage of submissions of new or revised water quality standards from States and Territories that are approved by EPA.**

**Performance Database:** The Water Quality Standards Action Tracking Application (WATA), an internal tracking application managed by the Office of Science and Technology described at <http://intranet.epa.gov/ost/div/shpd/wata-manual.pdf>, is the performance database for these measures. The information in this system provides the baseline and performance data for these measures.

**Data Source:** The underlying data sources for this measure are the submissions from states, territories, and authorized tribes of water quality standards to EPA pursuant to the Clean Water Act and EPA's water quality standards regulation at 40 CFR part 131. States, territories, and authorized tribes are required to review their water quality standards at least once every three years, and submit any new or revised water quality standards to EPA for review and approval. Each submission is accompanied by a letter from an appropriate official, and includes a certification by the state or territorial attorney general, or equivalent tribal official, that the standards were duly adopted pursuant to state, territorial, or tribal law.

EPA Regional Office staff members compile information from each submission and enter it into the WATA system. The information includes identifying data (name of jurisdiction, date of submission), data concerning components of the submission, and data concerning EPA's action on the submission. EPA has delegated approval and disapproval decisions to the Regional Administrator; the Regional Administrator may re-delegate the decisions to the appropriate Division Director, but no further. Approval decisions are judicially reviewable, and are accompanied by an appropriate administrative record.

**Methods, Assumptions, and Suitability:** The Office of Science and Technology has established computation metrics in the Water Quality Standards Action Tracking Application (WATA) system to produce the baselines and performance data for both measures. These metrics are as follows:

- Percentage of State, Territorial, and Tribal water quality standards submissions (received in the 12 month period ending April 30th of the fiscal year) that are approved by EPA. Partial approvals receive fractional credit.

This metric considers all new or revised submissions from May 1 of the previous year through April 30 of the current year. This reporting period provides regions at least five months to reach and document a valid approval decision. EPA management believes this is an adequate time for processing submissions. A "submission" is determined by the submitting jurisdiction, as described above. The metric then searches for whether the Regional Office has made any approval decision concerning the submission. If EPA approves the submission in full by the end of the reporting period, it will be counted with an approval value of 1. If EPA disapproves all

provisions of the standards, it will be counted with an approval value of 0 (zero). In some cases the Regional decision official may decide to approve some portions of the standards provisions, disapprove some portions, or defer actions on some portions. To accommodate these possibilities, and to reflect the complex nature of some submissions, the WATA system allows Regional staff to track portions of a submission as separate parts with weights corresponding to the number of actual provisions involved. When different decisions are reached on different parts or provisions of a submission, the metric calculates a fractional approval value. The fractional approval value is a number between 0 and 1, equal to the number of provisions approved, divided by the total number of provisions in the original submission. For example, if a submission contains 10 provisions and EPA approves 8 and disapproves 2, then the metric would count this as 0.8 submissions. The final performance metric is the sum of full or fractional approval values divided by the total number of submissions during the reporting period.

- Number of (a) States and Territories, and (b) authorized Tribes, that within the preceding three year period submitted new or revised water quality criteria acceptable to EPA that reflect new scientific information from EPA or other sources not considered in the previous standards

This measure utilizes a Regional Office entry in the WATA system which indicates whether a submission or submission part includes one or more new water quality criteria or revised criteria that reflect new scientific information from EPA or other sources not considered in the previous criteria. Biological criteria that are reflected explicitly in designated uses would count under this entry. If a state, territory, or tribe has not adopted any such criteria, the jurisdiction can nevertheless be counted under this measure if (a) EPA has issued new or revised water quality criteria, including revisions to the published table of EPA recommended criteria at <http://www.epa.gov/waterscience/criteria/wqcriteria.html>, but the state has determined through a scientific assessment that such a change is not relevant for its waters, or (b) the jurisdiction could certify to EPA that it has completed a defensible scientific review of the new scientific information EPA has issued and has determined that no changes are needed to their existing water quality criteria. The metric searches for one or more qualifying submissions or submission parts for each jurisdiction during the three-year period ending five months before the end of the reporting period, and that have been approved by EPA by the end of the reporting period. For example, for FY 2008 any qualifying submissions from May 1, 2005, through April 30, 2008, that were approved by September 30, 2008, would enable the jurisdiction to be counted. Note the overlap from one reporting year to the next: a state that last made such a submittal, in, say, February 2005, would be counted in FY 2005, FY 2006, and FY 2007 but not in FY 2008.

**QA/QC Procedures:** States, territories, and tribes conduct QA/QC of water quality standards submissions pursuant to individual state procedures. Because such submissions are subject to judicial review, the attorney general's certification described above provides assurance of the content of each submission. EPA regional staffs provide support to and interact with the jurisdictions as they develop, review, and adopt water quality standards. Each Regional Office provides data quality review of its entries in the WATA system. For example, Regional Offices generally assure that each entry is reviewed by the water quality standards coordinator, usually a senior scientist or environmental protection specialist with extensive experience in water quality standards actions. Data validation algorithms built into each entry screen also help improve data quality. In addition, a sample of entries is spot-checked by Headquarters' Office of Science and Technology staff. The Regions and Headquarters have been able to conduct the data quality reviews fairly easily because the number of submissions has averaged about 50

submissions per year in recent years, well within their available resources to provide adequate review.

**Data Limitations:** Submissions may vary considerably in size and complexity. For example, a submission may include statewide water quality standards revisions, use attainability analyses for specific water bodies, site-specific criteria applicable to specific types of waters, general statewide policies, antidegradation policies or procedures, and variances. Therefore, these measures – the number of submissions approved, and the number of jurisdictions with updated scientific information contained in adopted standards – do not provide an indicator of the scope, geographic coverage, policy importance, or other qualitative aspects of water quality standards. This information would need to be obtained in other ways, such as by reviewing the content of adopted and approved standards available at <http://www.epa.gov/waterscience/standards/wqslibrary/>, or contacting the appropriate Regional Office or state/territorial/tribal personnel.

**New/Improved Data Systems:** The Office of Science and Technology has no immediate plans for developing a new data system or enhancing the existing WATA system, other than refining metrics for assessing and interpreting performance results, or for assessing data quality.

**References:**

USEPA. September 8, 2005. *Water Quality Standards Acting Tracking Application: Users Manual*. Available at <http://intranet.epa.gov/ost/div/shpd/wata-manual.pdf>.

USEPA. 2000. *Water Quality Standards Regulation*. Code of Federal Regulations, 40 CFR part 131. Available at [http://www.access.gpo.gov/nara/cfr/waisidx\\_05/40cfr131\\_05.html](http://www.access.gpo.gov/nara/cfr/waisidx_05/40cfr131_05.html).

USEPA. August 1994. *Water Quality Standards Handbook*, 2<sup>nd</sup> edition. <http://www.epa.gov/waterscience/standards/handbook/>.

**FY 2006 Performance Measure: Percentage of waters assessed using statistically valid surveys.**

**Performance Database:** Data generated from the national assessment will be housed in the EPA Office of Water's STORET (STorage and RETrieval) data warehouse. Prior to entering the STORET warehouse, all datasets are housed in a temporary facility, such as ORD's SWIM database, where they are examined for QA purposes and undergo statistical analysis. Finalized datasets transferred to the STORET warehouse will include all water quality, physical and biological data and associated metadata for each survey. The STORET warehouse is available on the web at <http://www.epa.gov/STORET/index.html>.

**Data Source:** Samples will be collected over one sampling season, during a specified index period for each resource. Sites are sampled one time, with additional repeat samples collected at 10 percent of the sites to determine precision of methods. Surveys collect a suite of indicators relating to the biological, physical habitat and water quality of the resource in order to assess both the resource condition and determine the percentage meeting the goals of the CWA. Surveys will collect information on biological and abiotic factors at 30-50 sites on an ecoregion level II scale for each resource. These data are collected through EPA-State collaboration. Prior to sampling, field crews will undergo intensive training by EPA personnel on field sampling and collection techniques. Laboratory analysis will be conducted at either a state lab or contract lab following specified protocols for the survey. Data collection follows a Quality Assurance Project Plan (QAPP), with subsequent testing and auditing to ensure its application.

**Methods, Assumptions and Suitability:** The surveys are conducted using a probabilistic survey design, which allows extrapolation of results to the target population (specified water resource, e.g., wadeable streams, lakes, rivers, etc.). The collection design maximizes the spatial spread between sites, located by specific latitude and longitude combinations. The survey utilizes an indexed sampling period to increase the probability of accurately assessing condition and identifying any problems in water quality, physical or biological indices if they exist. Based on the QAPP and field protocol documents, a site is located by the sampling crew via Global Positioning System (GPS). Data are collected for each parameter following the protocols outlined in the field operations manual. Indices for the probabilistic surveys relate to the condition of the resource and the extent that the waters are supporting the fishable and swimmable goals of the Clean Water Act. Samples taken from the field are stored in accordance with field manual instructions and shipped to the processing laboratory. Laboratories will follow quality assurance (QA) plans and complete analysis and provide electronic information to the state or EPA. EPA and the state exchange data to ensure that each has a complete set. EPA and states analyze the data to assess regional and national condition of the water resource surveyed. Results of the analyses on a national and regional basis will be published in a publicly accessible peer reviewed report released within two years of sample collection. The overall change in condition of the water body type will be assessed on a five year cycle.

*Assumptions:* (1) The underlying target population (water resource sampled for the survey) has been correctly identified; (2) GPS is successful; (3) QAPP and field collection manuals are followed; (4) all samples are successfully collected; (5) all analyses are completed in accordance with the QAPP; and (6) a combination of data into indices is completed in a statistically rigorous manner.

*Suitability:* By design, all data are suitable to be aggregated up to the regional and national level to characterize the ecological condition of the waterbody resource and the associated stressors. Samples provide site specific point-in-time data and excellent representation of the entire resource (extrapolation to the entire resource supportable). Data will be used to characterize populations and subpopulations of waterbody resources through time and space. Data analysis and interpretation will be peer reviewed prior to completion of final report. The data are suitable for individual reports and to establish a baseline for subsequent surveys to evaluate trends.

**QA/QC Procedures:** Collection and processing of all samples are described in QAPP and Field Protocols documents associated with each survey. In addition, the QAPP will contain specific Data Quality Objectives (DQOs) and Measurement Quality Objectives (MQOs) associated with each survey. To ensure that the survey is obtaining the DQOs and MQOs, there are several QA steps built into each survey. Training for all crew members is required before sampling begins. Field evaluations are conducted for all crews to ensure methods are being followed. Each laboratory involved in the sample processing will adhere to the specified laboratory protocols and undergo a thorough and documented quality assurance/quality control (QA/QC) process. Submitted data will undergo a final QC check before analysis begins.

**Data Quality Reviews:** A concurrent peer review and public comment period will be held for each survey. During this time, the draft report will be posted on the web for interested parties to review and submit comments. An independent group of experts will be selected to serve on a peer review panel for the report. In house audits will also be conducted over the course of the survey.

**Data Limitations:** Because the data are collected in a manner to permit calculations of uncertainty and designed to meet specific Data Quality Objectives (DQOs), the results at the regional level are within about 2-4 percent of true values dependent upon the specific sample type. Detailed QA/QC checks throughout the survey reduce the data limitations and errors in sampling. The scale of the reporting units is limited by the number of samples taken in a specific region. To make a statistically valid statement about the condition of the resource, sample size should minimally include 30-50 sites per region. Since samples are collected one time at each site per survey, trends analysis will depend on future survey work. Lag time between sample collection and reporting will be between 1-2 years.

**Error Estimate:** The estimation of condition will vary for the national condition and the regional condition for each survey. The condition estimates are determined from the survey data using cumulative distribution functions and statistically-based uncertainty estimates.

**New/Improved Data or Systems:** Additional indicators, addressing regional specific needs can be added to the survey over time. QA requirements will be met by all laboratories participating in the surveys. Probabilistic surveys repeated on the same water body type utilizing a similar sample design will show condition trends for the resource on a broad geographic scale.

**References:**

Olsen, A. R. et al. 1999. *Statistical Issues for Monitoring Ecological and Natural Resources in the United States*. Environmental Monitoring and Assessment 54, 1-45

Stevens Jr., D. L. & Urqhart, N. S. 2000. *Response Designs and Support Regions in Sampling Continuous Domains*. Environmetrics 11, 11-41

Stevens Jr., D. L. 1997. *Variable Density Grid-based Sampling Designs for Continuous Spatial Populations*. Environmetrics 8, 167-195

STORET database website. <http://www.epa.gov/STORET/index.html>.

U.S. EPA. 2001. *National Coastal Condition Report*. EPA-620/R-01/005, and U.S. EPA. 2004. *National Coastal Condition Report II*. EPA-620/R-03/002.

**FY 2006 Performance Measures:**

- **Percentage of high priority EPA and State NPDES permits that are reissued as scheduled. (PART Measure)**
- **Percentage of high priority state NPDES permits reissued as scheduled. (PART Measure)**

**Performance Database:**

- U.S. EPA. Permit Compliance System (PCS). (database). Washington, DC (Office of Enforcement and Compliance Assurance)
- Permit Issuance Forecasting Tool (PIFT) (database). Washington, DC (Office of Water)
- Priority Permits Data Base. (web-based database). Washington, DC (Office of Water)

The Permit Compliance System (PCS) and the Integrated Compliance Information System (ICIS-NPDES) are used to determine which individual permits are current through date fields for permit issuance and expiration. EPA has carried out detailed permit renewal backlog tracking

with PCS data since November 1998. To supplement the individual permit data from PCS, EPA uses the Permit Issuance Forecasting Tool (PIFT) to track the current or expired status of facilities covered under non-storm water general permits. The PIFT has been used to track non-storm water general permit facilities since January 2001.

EPA has undertaken a new “priority permits” issuance strategy that focuses permitting activities on significant expired permits. The Priority Permits Database is a web-based system that tracks the specific permits that each State and Region has identified as priority. States and Regions enter the permits, and EPA HQ uses PCS/ICIS-NPDES to track permit issuance status of these permits.

**Data Source:** EPA’s Regional offices and NPDES authorized states enter data into PCS and/or ICIS-NPDES and EPA’s Regional offices are responsible for entering data to the PIFT. EPA’s Regional offices and States enter permit identification information into the Priority Permits database.

**Methods, Assumptions and Suitability:** For individual permits, monthly reports are generated from PCS/ICIS-NPDES that use permit issuance and expiration dates to aggregate, across each state, the number of major and minor permits which have not exceeded expiration dates by more than 180 days. Permits that have not reached their expiration date, or are less than 180 days past that date, are considered “current.” Permits that have not been renewed within 180 days of expiration are considered “expired” or “backlogged.” Although PCS tracks some data for facilities covered by NPDES non-storm water general permits, States and Regions are not required to input these data; thus, the data are incomplete and unreliable (ICIS-NPDES is ultimately expected to track this data. See discussion below). To fill this data gap, EPA developed the PIFT tracking system to gather basic counts of facilities covered by current and expired non-storm water general permits. Further, to complement tracking of all permits, the Priority Permits Database was developed to track the status of high priority permits. Together the PCS, ICIS-NPDES, PIFT and Priority Permits data are intended to measure NPDES program coverage. The data are suitable for year -to-year comparisons of officially tracked permit status.

**QA/QC Procedures:** The PCS and ICIS-NPDES databases are managed by the Office of Enforcement and Compliance Assurance (OECA); PIFT and Priority Permits Database are managed by the Office of Water (OW). EPA Headquarters (HQ) staff in OECA review data submitted by states as part of the QA/QC process. In addition, OW continues to work with States and Regions to improve the quality and completeness of the data. EPA generates state-by-state reports that list PCS/ICIS-NPDES “key data” fields, including permit issuance and expiration dates, as well as compliance and enforcement data, and provides these lists to NPDES states and Regions for review and cleanup. EPA also created a spread sheet comparing latitude/longitude (lat/long) data for municipal treatment systems collected by the Clean Water Needs Survey to the lat/long data in PCS. This spread sheet is provided to States and Regions so that, where discrepancies exist between state and PCS/ICIS-NPDES data, EPA and States can make corrections in PCS/ICIS-NPDES. EPA will continue to focus on improving the lat/long data in PCS/ICIS-NPDES, especially at the pipe level.

Additionally, where States maintain “key” permit data in separate state-level systems, EPA is providing support to upload these data to PCS.

Regions enter data into the PIFT and Priority Permits database, both of which are web-based systems maintained by OW.

**Data Quality Review:** The Office of Inspector General (OIG) has issued several findings regarding poor PCS data quality, and PCS has been listed as an Agency-Level Weakness under the Federal Managers Financial Integrity Act since 1999. This weakness affects EPA's ability to obtain a true picture of the status of the NPDES program. Fortunately, permit event data such as the permit issuance and expiration data needed for this performance measure are generally better populated than other key data elements. As noted previously, OW is offering support to States for data upload, data entry, and, if necessary, data compilation to improve data quality. This has resulted in improved tracking of data, particularly industrial permits. The replacement of PCS with ICIS-NPDES, a modernized and user-friendly NPDES data system, began in June 2006 when eleven states began using the system; seven other states will be migrated to the new system in August. Use of ICIS-NPDES should greatly increase state participation and data quality. Batch states (those states with their own data systems) will not be migrated to ICIS-NPDES until appropriate mechanisms are in place to transfer the data.

**Data Limitations:** EPA is aware of data gaps in PCS, particularly for minor facilities, and is aware of discrepancies between state databases and PCS; however, EPA's data clean-up over the past five years has significantly improved data quality. The PIFT has enabled EPA to report on inventories and status of non-storm water facilities covered by NPDES general permits, but the data are not as comprehensive as those tracked in PCS. In 2006, EPA is upgrading PIFT for EPA-issued permits to improve inventory tracking. There are no national-level data to track permit issuance and expiration status of facilities covered by storm water general permits; thus, they are not tracked under this performance measure. These data is not expected to be available until all states are willing and able to flow the data to ICIS-NPDES. Priority Permits data are verified and reliable.

**Error Estimate:** We believe that the permit renewal backlog data for major facilities is accurate within 2 percent based on input from EPA's Regional offices and states through a quarterly independent verification. For minor facilities, however, the confidence interval is less precise and probably overestimates the permit renewal backlog for minor facilities by 5 percent based on anecdotal information from EPA's Regional offices and states.

**New/Improved Data or Systems:** EPA headquarters is providing contractor assistance to improve the data quality in PCS. The new modernized ICIS-NPDES was rolled out in June 2006, with eleven states using the system. An additional seven states are scheduled to begin using the system in August 2006. ICIS -NPDES will be easier to use and will improve the quality of data needed to manage the NPDES program.

**References:** PCS information is publicly available at:  
<http://www.epa.gov/compliance/planning/data/water/pcssys.html>.

**FY 2006 Performance Measure: Loading (Pounds) of pollutants removed per program dollar expended. (PART efficiency measure)**

**Performance Database:** This measure is calculated using a variety of methods. For point sources in industry sectors with effluent guidelines, a spread sheet is used. An average per facility pollutant reduction value is assigned to each permitted effluent discharger according to the effluent guideline developed in each industrial sector. Using both the average per facility value and the number of permits issued as reported under PCS, the spreadsheet then generates the values for the total pollutants reduced.

The above calculation is used in combination with another spread sheet<sup>19</sup> to estimate pollutant reductions achieved through controls at Publicly Owned Treatment Works (POTWs), municipal storm water and construction storm water. Industrial storm water is not included nor are reductions from water quality based effluent limits.

POTWs: Estimated reductions from POTWs were calculated using data from a detailed trend analysis for Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) loadings in "Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment"<sup>20</sup>. The report provides flow estimates, loading estimates and a distribution of treatment class for every 2 to 4 years from 1968 through 1996. In addition, the report uses data from the Clean Watershed Needs Survey (CWNS)<sup>21</sup> to provide projections for 2016. EPA has also prepared a 2004 update for Chapter Two<sup>22</sup> of the 2000 "Progress in Water Quality."

Municipal Storm Water: Estimates from municipal storm water were derived from EPA models of the volume of storm water discharged from municipal separate storm sewer systems (MS4s) developed as part of a 1997 EPA draft report. The methodology and results of the 1997 draft report are described in "Economic Analysis of the Final Phase II Storm Water Rule", EPA, October 1999.<sup>23</sup>

Construction Storm Water: EPA developed estimates of the sediment load present in construction storm water using a model developed by the US Army Corps of Engineers. The model uses the construction site version of the Revised Universal Soil Loss Equation (RUSLE). Uncontrolled (i.e. prior to implementation of Best Management Practices (BMPs)) and controlled (i.e. after the implementation of BMPs) sediment loadings were estimated for 15 climatic regions with three site sizes (one, three, and five acres), three soil erodibility levels (low, medium, and high), three slopes (3 percent, 7 percent, and 12 percent), and various BMP combinations. The methodology and results are described in "Economic Analysis of the Final Phase II Storm Water Rule."

The values derived from the above methods are summed to obtain the total pollutant load reductions achieved under the surface water program.

To calculate the PART efficiency measure, the total cumulative pollutant reductions were divided by the total number of dollars devoted to the EPA Surface Water Program (SWP), grants to States under Clean Water Act (CWA) section 106, plus State 'match' dollars, annually.

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<sup>19</sup> SWP Efficiency: Millions of Pounds Removed (unpublished Excel Spread Sheet). (April, 2005). Washington, D.C.: United States Environmental Protection Agency (Office of Water).

<sup>20</sup> *Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment* (EPA-832-R-00-008; June 2000). Available at: <http://www.epa.gov/owm/wquality/benefits.htm>.

<sup>21</sup> Clean Watershed Needs Survey 2000 (Electronic data base). (2000). Washington, D.C. U.S. Environmental Protection Agency (Office of Wastewater Management).

<sup>22</sup> 2004 update of Chapter 2, "Nationwide Trends in BOD Loading Based on Population and POTW Treatment Design" of the report, *Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment*.

<sup>23</sup> Economic Analysis of the Final Phase II Storm Water Rule, Oct. 1, 1999, US EPA. Available at: <http://www.epa.gov/npdes> or [http://cfpub.epa.gov/npdes/docs.cfm?program\\_id=6&view=allprog&sort=name](http://cfpub.epa.gov/npdes/docs.cfm?program_id=6&view=allprog&sort=name)

SWP and CWA Section 106 budget is pulled from EPA's Integrated Financial Management System (IFMS). State 'match' dollars are reported to EPA by States.

**Data Sources:** For industrial sector permits, each EPA Regional office reports the actual number of permits issued in the past year, typically drawn from EPA's Permit Compliance System or Integrated Compliance Information System. For direct dischargers subject to effluent guidelines, the average per facility value for pollutant reduction is derived from the Technical Development Documents (TDDs) produced at the time of the effluent guideline (ELG) rulemaking. TDDs are available for: Pulp & Paper, Pharmaceuticals, Landfills, Industrial Waste Combustors, Centralized Waste Treatment, Transportation Equipment Cleaning, Pesticide Manufacturing, Offshore Oil & Gas, Coastal Oil & Gas, Synthetic Based Drilling Fluid, Concentrated Animal Feeding Operations, Meat and Poultry, Metal Products and Machinery, Aquaculture. States and EPA's Regional offices enter data into PCS and ICIS.

CSO loadings are estimated based on data obtained from the Clean Watershed Needs Survey and from the "Report to Congress on the Impacts and Control of Combined Sewer Overflows and Sanitary Sewer Overflows." States and EPA's Regional offices provide data for the CSO Report to Congress and the Clean Watershed Needs Survey.

**Methods, Assumptions and Suitability:** EPA uses the spreadsheets described above to estimate loadings. The data are aggregated across different sources to determine loading reductions at the national level. Loadings appear to be the best surrogate for determining the environmental impacts of point sources. Pollutant load reductions, along with some of the water quality improvement measures, tell the story about environmental outcomes. Pollutant reductions per dollar spent provides a snapshot of the effectiveness and efficiency of the surface water program, and comparing this over time helps to delineate a trend.

**QA/QC Procedures:** The loadings spreadsheets are based on information from rulemakings and policies that have undergone extensive review. The effluent guidelines follow EPA quality assurance/quality control (QA/QC) procedures. The PCS database is managed by the Office of Enforcement and Compliance Assurance (OECA). EPA Headquarters (HQ) staff in OECA review data submitted by states as part of the QA/QC process. (See full description under "current permits" measure).

**Data Quality Reviews:** The Office of Inspector General (OIG) has issued several findings regarding poor PCS data quality, and PCS has been listed as an Agency-Level Weakness under the Federal Managers Financial Integrity Act since 1999. This weakness affects EPA's ability to obtain a true picture of the status of the NPDES program. Fortunately, the permit issuance and expiration data needed for this performance measure are generally better populated than other data elements. As noted previously, OW is offering support to States for data upload, data entry, and, if necessary, data compilation support to improve data quality. This has resulted in improved tracking of data, particularly industrial permits. The replacement of PCS with ICIS-NPDES, a modernized and user-friendly NPDES data system, began in June 2006 when eleven states began testing the system; seven other states will be migrated to the new system in August 2006. Use of ICIS should greatly increase state participation and data quality. Batch states (those states with their own data systems) will not be migrated to ICIS until appropriate mechanisms are in place to transfer the data.

**Data Limitations:** There is inconsistent and poor data quality in the PCS data base with respect to flow and discharge monitoring, including missing data for minor facilities which has not been required to be entered. Neither monitoring nor flow data are required for certain

categories of general permits. The Agency, therefore, is not able to provide sufficient information to measure loadings reductions for all of the approximately 550,000 facilities that fall under the NPDES program. The effluent guidelines loadings are estimates based the number of permits issued across an industrial sector.

**Error Estimate:** At this time we are unable to estimate error due to the lack of actual national level data to compare to estimates based on models.

**New/Improved Data or Systems:** EPA headquarters is providing contractor assistance to improve the data quality of PCS. ICIS-NPDES began replacing PCS in 2006. ICIS-NPDES is easier to use and should include data needed to manage the NPDES program.

EPA continues to evaluate and explore methods for calculating loadings reductions nation-wide from all sources.

**References:**

Clean Watershed Needs Survey 2000 (Electronic data base). (2000). Washington, D.C. U.S. Environmental Protection Agency (Office of Wastewater Management).

Effluent guidelines development documents are available at:  
<http://www.epa.gov/waterscience/guide>.

Modeling databases and software being used by the Office of Water are available at:  
<http://www.epa.gov/water/soft.html>

PCS information is publicly available at:  
<http://www.epa.gov/compliance/planning/data/water/pcssys.html>

**FY 2006 Performance Measure: Reduce the number of households on tribal lands lacking access to basic sanitation.**

**Performance Database:** Sanitation Tracking and Reporting System (STARS), the Indian Health Service (IHS), Office of Environmental Health and Engineering (OEHE), Division of Sanitation Facilities Construction (DSFC).

**Data Sources:** The STARS includes data on sanitation deficiencies, Indian homes and construction projects. STARS is currently comprised of two sub data systems, the Sanitation Deficiency System (SDS) and the Project Data System (PDS).

The SDS is an inventory of sanitation deficiencies for existing Indian homes and communities. The IHS is required to prioritize SDS deficiencies and annually report to Congress. The identification of sanitation deficiencies can be made several ways, the most common of which follow:

- Consultation with Tribal members and other Agencies
- Field visits by engineers, sanitarians, Community Health Representatives (CHRs), nurses, or by other IHS or tribal health staff
- Sanitary Surveys
- Community Environmental Health Profiles
- Bureau of Indian Affairs (BIA) Inventory
- Census Bureau Reports (for comparison purposes only)

- Tribal Master Plans for Development
- Telephone Surveys
- Feasibility Studies

The most reliable and preferred method is a field visit to each community to identify and obtain accurate numbers of homes with sanitation deficiencies. The number of Indian homes within the communities must be consistent among the various methods cited above. If a field visit cannot be made, it is highly recommended that more than one method be used to determine sanitation deficiencies to increase the accuracy and establish greater credibility for the data.

The PDS is a listing of funded construction projects and is used as a management and reporting tool.

**QA/QC Procedures:** Quality assurance for the Indian country water quality performance measure depends on the quality of the data in the STARS. The STARS data undergoes a series of quality control reviews at various levels within the IHS DSFC. The DSFC is required to annually report deficiencies in SDS to Congress in terms of total and feasible project costs for proposed sanitation projects and sanitation deficiency levels for existing homes.

**Data Quality Reviews:** The SDS data initially undergoes a series of highly organized reviews by experienced tribal, IHS field, IHS district and IHS area personnel. The data are then sent to the DSFC headquarters office for review before final results are reported. The DSFC headquarters reviews the SDS data for each of the 12 IHS area offices. The data quality review consists of performing a number of established data queries and reports which check for errors and/or inconsistencies. In addition, the top 25 SDS projects and corresponding community deficiency profiles for each area are reviewed and scrutinized thoroughly. Detailed cost estimates are highly encouraged and are usually available for review.

**Data Limitations:** The data are limited by the accuracy of reported data in STARS.

**Error Estimate:** The IHS DSFC requires that higher-level projects (those with the possibility of funding prior to the next update) must be developed to allow for program implementation in an organized, effective, efficient manner. Those SDS projects (top 20 percent) must have cost estimates within 10 percent of the actual costs.

**New/Improved Data or Systems:** The STARS is a web based application and therefore allows data to be continuously updated by personnel at various levels and modified as program requirements are identified. PDS has been modified to meet 40CFR31.40 reporting requirements. In 2006 STARS is being modified to include rural communities that are not Alaska Native Villages but has a substantial Alaska Native population.

**References:** Indian Health Service (IHS), Division of Sanitation Facilities (DSFC). Criteria for the Sanitation Facilities Construction Program, June 1999, Version 1.02, 3/13/2003. [http://www.dsfc.ihs.gov/Documents/Criteria\\_March\\_2003.cfm](http://www.dsfc.ihs.gov/Documents/Criteria_March_2003.cfm). Indian Health Service (IHS), Division of Sanitation Facilities (DSFC). Sanitation Deficiency System (SDS), Working Draft, "Guide for Reporting Sanitation Deficiencies for Indian Homes and Communities", May 2003. <http://www.dsfc.ihs.gov/Documents/SDSWorkingDraft2003.pdf>.

**FY 2006 Performance Measure: Number of monitoring stations in Tribal waters that show at least a 10 percent improvement in each of 4 key parameters: total nitrogen, total phosphorus, dissolved oxygen and fecal coliform (2002 Baseline: four key parameters**

**available at 900 sampling stations in Indian country).**

**Performance Database:** All of the monitoring stations originally included in the baseline for this measure (900) are United States Geological Survey (USGS) stations with USGS station identification numbers. In the time since the 900 sites were originally identified, additional monitoring stations on Tribal lands have been located. The water quality monitoring results for the additional stations on Tribal lands are recorded in the USGS National Water Information System (NWIS) and EPA's Storage and Retrieval database (STORET). Through STORET and NWIS, EPA and USGS have established standardized formats for reporting water quality data and information.

Data on total nitrogen, total phosphorus, dissolved oxygen and fecal coliform are readily available through the STORET ([www.epa.gov/STORET](http://www.epa.gov/STORET)) and the NWIS (<http://waterdata.usgs.gov/nwis/>) websites for those monitoring stations in Tribal waters where these data have been collected and loaded into the databases.

**Data Source:** Monitoring activities at the sampling stations included in this measure are not conducted or reported by Tribes. Sampling is performed at these monitoring stations by a variety of entities, for a variety of purposes and with differing frequencies. The proximity of these stations to watersheds undergoing restoration/protection activities may not be included as part of the information included in the STORET database or NWIS. The use of these monitoring stations in this performance measure is opportunistic, and thus sampling results may not necessarily reflect the impacts of restoration activities performed as part of the implementation of Clean Water Act programs by Tribes.

**Methods, Assumptions and Suitability:** Sampling is performed at these monitoring stations by a variety of entities, for a variety of purposes and with differing frequencies. Methods used to measure total nitrogen, total phosphorus, dissolved oxygen and fecal coliform among these sites likely differ. However, metadata for sampling results, including sampling methods, detection limits and sampling date and time, are readily available to the public through the STORET database and NWIS. Given that the measure is based on improvements in water quality at individual monitoring stations in tribal lands over time, the use of differing methods at sampling stations included in the measure is not necessarily problematic. Sampling results at these stations are likely to be suitable for tracking progress in the measure. Implicit in the measure is the assumption that improvements in water quality at these sampling stations reflect the successful implementation of CWA programs by Tribes. The monitoring stations included in the measure are used for a variety of purposes and with differing frequencies and the proximity of the monitoring stations to waters undergoing restoration/protection actions by Tribes is unknown. Given this, the suitability of sampling results at these stations for tracking successful implementation of CWA programs by Tribes is uncertain.

**QA/QC Procedures:** Samples at the monitoring stations included in this measure are collected and processed by a variety of entities and for differing purposes. As a result, QA/QC procedures for these samples may differ considerably. However, QA/QC procedures for the samples are readily available to the public through the STORET website or obtained from the USGS.

**Data Quality Review:** Data owners are responsible for data quality review. Information on the quality of the data in STORET is readily available to the public through the website. The USGS is responsible for data quality review of sampling results loaded in the NWIS. No audits or data

quality reviews for the monitoring results included in this measure have been conducted by EPA for data in the STORET or NWIS database.

**Data Limitations:** It is still early to determine the full extent of data limitations. The monitoring stations included in the universe for this measure have been selected opportunistically by EPA based on their presence on Tribal lands and reporting sampling results for total nitrogen, total phosphorus, dissolved oxygen and fecal coliform. Sampling is performed at these monitoring stations by a variety of entities and for a variety of purposes with differing frequencies. The proximity of these stations to watersheds undergoing restoration/protection activities may not be included as part of the information included on the STORET or NWIS databases. Sampling results may not necessarily reflect the impacts of restoration activities performed as part of the implementation of Clean Water Act programs by Tribes. The impact of these data limitations on progress as reported in the measure is unclear.

**Error Estimate:** No error estimate is available for this data.

**New/Improved Data or Systems:** EPA has significantly improved the ease of data retrieval from the STORET database with the completion of the STORET data warehouse. Sampling results are being loaded into STORET at a rate of approximately 1 million records/month, which will significantly increase the data available to track progress in the measure. EPA and USGS are currently implementing a memorandum of understanding to create a common view for data included in the STORET database and NWIS. This work also will facilitate the ability to measure progress.

**References:** Water quality data in STORET are publicly available at [www.epa.gov/STORET](http://www.epa.gov/STORET). Water quality data from USGS are available at <http://waterdata.usgs.gov/nwis/>. The Office of Water Quality Management Plan (July 2001) is available on the Intranet at <http://intranet.epa.gov/ow/infopolicy.html>.

#### **FY 2006 Performance Measures:**

- **Improve national and regional coastal aquatic system health on the “good/fair/poor” scale of the National Coastal Condition Report (1-5 scale).**
- **Maintain water clarity and dissolved oxygen in coastal waters at the national levels reported in the 2002 National Coastal Condition Report.**
- **Improve ratings reported on the national “good/fair/poor” scale of the National Coastal Condition Report for coastal wetlands loss; contamination of sediments; benthic quality; & eutrophic condition.**

**Performance Database:** EMAP/NCA (Environmental Monitoring and Assessment Program/National Coastal Assessment) database (housed EPA/ORD/NHEERL/AED, Narragansett, RI)(Environmental Protection Agency/Office of Research and Development/National Health and Environmental Effects Research Laboratory/Gulf Ecology Division); pre-database information housed in ORD/NHEERL facility in Gulf Breeze, FL (Gulf Ecology Division) (pre-database refers to a temporary storage site for data where they are examined for QA purposes, have appropriate metadata attached and undergo initial statistical analyses); data upon QA acceptance and metadata completion are transferred to EMAP/NCA database and are web available at [www.epa.gov/emap/nca](http://www.epa.gov/emap/nca).

**Data Source:** Probabilistic surveys of ecological condition completed throughout the Mid-Atlantic and Gulf of Mexico by EPA’s Office of Research and Development (ORD) in 1991-1994, in southern Florida in 1995, in the Southeast in 1995-1997, in the Mid-Atlantic in 1997-1998, in

each coastal state in 2000-2004 (except Alaska and Hawaii), in Alaska in 2002 and 2004, in Hawaii in 2002 and 2004, and in Puerto Rico in 2000 and 2004, and in other island territories (Guam, American Samoa and U.S. Virgin Islands) in 2004. Surveys collect condition information regarding water quality, sediment quality and biotic condition at 70-100 sites/region (e.g., mid-Atlantic) each year of collection prior to 1999 and at 35-150 sites in each state or territory/year (site number dependent upon state) after 1999. Additional sampling by the National Estuary Program (NEP) included all individual national estuaries; the total number of sites within NEP boundaries was 30 for the two-year period 2000-2002.

These data are collected through a joint EPA-State cooperative agreement and the States follow a rigid sampling and collection protocol following intensive training by EPA personnel. Laboratory processing is completed at either a state laboratory or through a national EPA contract. Data collection follows a Quality Assurance Project Plan (QAPP) (either the National Coastal QAPP or a variant of it) and QA testing and auditing by EPA.

**Methods, Assumptions and Suitability:** The surveys are conducted using a probabilistic survey design which allows extrapolation of results to the target population (in this case - all estuarine resources of the specific state.) The collection design maximizes the spatial spread between sites, located by specific latitude-longitude combinations. The survey utilizes an indexed sampling period (generally late summer) to increase the probability of encountering water quality, sediment quality and biotic condition problems, if they exist. Based on the QAPP and field collection manual, a site in a specific state is located by sampling vessel via Global Positioning System (GPS) and water quality is measured on board at multiple depths. Water samples are taken for chemistry; sediment samples are taken for chemistry, toxicity testing and benthic community assessment; and fish trawls are conducted to collect community fish data and provide selected fish (target species) for analysis of whole body and/or fillet contaminant concentrations. Samples are stored in accordance with field manual instructions and shipped to the processing laboratory. Laboratories follow QA plans and complete analyses and provide electronic information to the state or EPA. EPA and the state exchange data to ensure that each has a complete set. EPA analyzes the data to assess regional conditions, whereas the states analyze the data to assess conditions of state-specific waters. Results of analyses on a national and regional basis are reported as chapters in the National Coastal Condition Report (NCCR) series. The overall regional condition index is the simple mean of the five indicators' scores used in the Coastal Condition Report (in the NCCR2 a recalculation method was provided for direct comparison of the successive reports). An improvement for one of the indicators by a full category unit over the eight year period will be necessary for the regional estimate to meet the performance measurement goal (+0.2 over an eight year period).

*Assumptions:* (1) The underlying target population (estuarine resources of the United States) has been correctly identified; (2) GPS is successful; (3) QAPP and field collection manuals are followed; (4) all samples are successfully collected; (5) all analyses are completed in accordance with the QAPP; and (6) all combinations of data into indices are completed in a statistically rigorous manner.

*Suitability:* By design all data are suitable to be aggregated to the state and regional level to characterize water quality, sediment quality, and biotic condition. Samples represent "reasonable", site-specific point-in-time data (not primary intention of data use) and an excellent representation of the entire resource (extrapolation to entire resource supportable). The intended use of the data is the characterization of populations and subpopulations of estuarine resources through time. The data meet this expectation and the sampling, response, analysis and reporting designs have been peer reviewed successfully multiple times. The data are

suitable for individual calendar year characterization of condition, comparison of condition across years, and assessment of long-term trends once sufficient data are collected (7-10 years). Data are suitable for use in National Coastal Condition calculations for the United States and its regions to provide performance measurement information. The first long-term trends analysis will appear in the next NCCR (NCCRIII) representing trends between 1990-2002.

**QA/QC Procedures:** The sampling collection and analysis of samples are controlled by a Quality Assurance Project Plan (QAPP) (EPA 2001) and the National Coastal Assessment Information Management Plan (IMP)(EPA 2001). These plans are followed by all twenty-three coastal states and 5 island territories. Adherence to the plans are determined by field training (conducted by EPA ORD), field audits (conducted by EPA/ORD), round robin testing of chemistry laboratories (conducted by EPA/ORD), overall systems audits of state programs and national laboratory practices (conducted by EPA), sample splits (sent to reference laboratories), blind samples (using reference materials) and overall information systems audits (conducted by EPA/ORD). Batch sample processing for laboratory analyses requires the inclusion of QA samples in each batch. All states are subject to audits at least once every two years. All participants received training in year 2000 and retraining sessions are scheduled every two years.

**Data Quality Reviews:** Data quality reviews have been completed in-house by EPA ORD at the regional and national level in 2000-2003 (National Coastal Assessment 2000-2003) and by the Office of Environmental Information (OEI) in 2003 (assessment completed in June, 2003 and written report not yet available; oral debriefing revealed no deficiencies). No deficiencies were found in the program. A national laboratory used in the program (University of Connecticut) for nutrient chemistry, sediment chemistry and fish tissue chemistry is being evaluated by the Inspector General's Office for potential falsification of laboratory results in connection with other programs not related to NCA. The NCA has conducted its own audit assessment and only one incorrect use of a chemical digestion method for inorganic chemistry samples (metals) was found. This error was corrected and all samples "digested" incorrectly were reanalyzed at no cost.

**Data Limitations:** Data limitations are few. Because the data are collected in a manner to permit calculation of uncertainty and designed to meet a specific Data Quality Objective (DQO) (<10 percent error in spatial calculation for each annual state estimate), the results at the regional level (appropriate for this performance measure) are within about 2- 4 percent of true values dependent upon the specific sample type. Other limitations as follows: (a) Even though methodology errors are minimized by audits, in the first year of the NCA program (2000) some errors occurred resulting in loss of some data. These problems were corrected in 2001 and no problems have been observed since. (b) In some instances, (<5 percent) of sample results, QA investigation found irregularities regarding the precision of measurement (e.g., mortality toxicity testing of controls exceeded detection limit, etc.). In these cases, the data were "flagged" so that users are aware of the potential limitations. (c) Because of the sampling/ analysis design, the loss of data at a small scale (~ 10 percent) does not result in a significant increase in uncertainty in the estimate of condition. Wholesale data losses of multiple indicators throughout the U.S. coastal states and territories would be necessary to invalidate the performance measure. (d) The only major source of external variability is year-to-year climatic variation (drought vs. wet, major climatic event, etc.) and the only source of internal variation is modification of reporting indicators (e.g., new indices, not a change in data collected and analyzed). This internal reporting modification requires a re-analysis of earlier information to permit direct comparison. (e) There is generally a 2-3 year lag from the time of collection until reporting. Sample analysis generally takes one year and data analysis another. Add another

year for report production and peer review. (f) Data collections are completed annually; The EPA/ORD data collection collaboration will continue through 2004. Beginning in 2005, ORD began assisting OW, as requested, with expert advice, but discontinued its financial support of the program.

**Error Estimate:** The estimate of condition (upon which the performance measure is determined) has an annual uncertainty rate of about 2-3 percent for national condition, about 5-7 percent for individual regional indicators (composite of all five states data into a regional estimate), and about 9-10 percent for individual state indicators. These condition estimates are determined from the survey data using cumulative distribution functions and the uncertainty estimates are calculated using the Horvitz-Thompson estimator.

#### **New/Improved Data or Systems:**

- (1) Changes have occurred in the data underlying the performance measure based on scientific review and development. A change in some reporting indicators has occurred in order to more accurately represent the intended ecological process or function. For example, a new eutrophication index was determined for the 2000 data. In order to compare this new index to the 1991-1994 data, the earlier data results must be recomputed using the new technique. This recalculation is possible because the underlying data collection procedures have not changed.
- (2) New national contract laboratories have been added every year based on competition. QA requirements are met by the new facilities and rigorous testing at these facilities is completed before sample analysis is initiated. QA adherence and cross-laboratory sample analysis has minimized data variability resulting from new laboratories entering the program.
- (3) The only reason for the discontinuation of the National performance goal would be the elimination of the surveys after 2004 or any other year thereafter.

In order to continue to utilize the 2001 National Coastal Condition report as the baseline for this performance measure, the original scores reported in 2001 have been re-calculated in the 2004 report using the index modifications described above (#1). These "new" results for the baseline (re-calculated scores) are reported in Appendix C of the 2005 report.

#### **References:**

1. Environmental Monitoring and Assessment Database (1990-1998) and National Coastal Assessment Database (2000- 2004) websites: [www.epa.gov/emap](http://www.epa.gov/emap) and [www.epa.gov/emap/nca](http://www.epa.gov/emap/nca) (NCA data for 2000 is only data available at present)
2. National Coastal Assessment. 2000-2003. Various internal memoranda regarding results of QA audits. (Available through John Macauley, National QA Coordinator NCA, USEPA, ORD/NHEERL/GED, 1 Sabine Island, Gulf Breeze, FL 32561)
3. National Coastal Assessment. 2001. Quality Assurance Project Plan. EPA/620/R-01/002.(Available through John Macauley above)
4. National Coastal Assessment. 2001. Information Management Plan. EPA/620/R-01/003 (Available through Stephen Hale, NCA IM Coordinator, ORD/NHEERL/AED, 27 Tarzwell Drive, Narragansett, RI)
5. U.S. Environmental Protection Agency. 2001. National Coastal Condition Report. EPA-620/R- 01/005.

U.S. Environmental Protection Agency. 2004. National Coastal Condition Report II. In review  
Assigned Report Number EPA-620/R-03/002.

## **GOAL 2 OBJECTIVE 3**

### **FY 2006 Performance Measures:**

- **Final reports of full-scale demonstrations of arsenic treatment technologies.**
- **Report on bioassessment methods for a range of designated uses in freshwater systems within Mid-Western U.S. rivers.**

**Performance Database:** Program output; no internal tracking system

## **GOAL 3 OBJECTIVE 1**

### **FY 2006 Performance Measures:**

- **Daily per capita generation. (PART performance)**
- **Millions of tons municipal solid waste diverted. (PART performance)**

**Performance Database:** Data are provided by the Department of Commerce. EPA does not maintain a database for this information.

**Data Source:** The baseline numbers for municipal solid waste (MSW) source reduction and recycling are developed using a materials flow methodology employing data largely from the Department of Commerce and described in the EPA report titled "Characterization of Municipal Solid Waste in the United States." The Department of Commerce collects materials production and consumption data from various industries.

**Methods, Assumptions and Suitability:** Data on domestic production of materials and products are compiled using published data series. U.S. Department of Commerce sources are used, where available; but in several instances more detailed information on production of goods by end-use is available from trade associations. The goal is to obtain a consistent historical data series for each product and/or material. Data on average product lifetimes are used to adjust the data series. These estimates and calculations result in material-by-material and product-by-product estimates of MSW generation, recovery, and discards. To strategically support attainment of the 35 percent recycling goal, EPA has identified specific components of the MSW stream on which to focus: paper and paperboard, organics (yard and food waste), and packaging and containers. For these targeted efforts EPA will examine data on these waste components.

There are various assumptions factored into the analysis to develop estimates of MSW generation, recovery and discards. Example assumptions (from pages 141-142 of year 2000 "Characterization Report") include: Textiles used as rags are assumed to enter the waste stream the same year the textiles are discarded. Some products (e.g., newspapers and packaging) normally have short lifetimes and products are assumed to be discarded in the year they are produced.

**QA/QC Procedures:** Quality assurance and quality control are provided by the Department of Commerce's internal procedures and systems. The report prepared by the Agency, "Characterization of Municipal Solid Waste in the United States," is reviewed by a number of experts for accuracy and soundness.

**Data Quality Review:** The report, including the baseline numbers and annual rates of recycling and per capita municipal solid waste generation, is widely accepted among experts.

**Data Limitations:** Data limitations stem from the fact that the baseline statistics and annual rates of recycling and per capita municipal solid waste generation are based on a series of models, assumptions, and extrapolations and, as such, are not an empirical accounting of municipal solid waste generated or recycled.

**New/Improved Data or Systems:** Because the statistics on MSW generation and recycling are widely reported and accepted by experts, no new efforts to improve the data or the methodology have been identified or are necessary.

**References:** *Municipal Solid Waste in the United States: 2003 Facts and Figures*, EPA, April 2005 (EPA530-F-05-003), <http://www.epa.gov/epaoswer/non-hw/muncpl/msw99.htm>.

**FY 2006 Performance Measure: Percent of RCRA hazardous waste management facilities with permits or other approved controls in place. ((PART performance))**

**Performance Database:** The Resource Conservation Recovery Act Information System (RCRAInfo) is the national database which supports EPA's RCRA program.

**Data Source:** Data are entered by the states. Supporting documentation and reference materials are maintained in Regional and state files. EPA's Regional offices and authorized states enter data on a rolling basis.

**Methods, Assumptions and Suitability:** The Resource Conservation Recovery Act Information System (RCRAInfo) is the national database which supports EPA's RCRA program. RCRAInfo contains information on entities (generically referred to as "handlers") engaged in hazardous waste generation and management activities regulated under the portion of RCRA that provides for regulation of hazardous waste. RCRAInfo has several different modules, including status of RCRA facilities in the RCRA permitting universe.

**QA/QC Procedures:** States and EPA's Regional offices generate the data and manage data quality related to timeliness and accuracy. Within RCRAInfo, the application software contains structural controls that promote the correct entry of the high-priority national components. RCRAInfo documentation, which is available to all users on-line at <http://www.epa.gov/rcrainfo/>, provides guidance to facilitate the generation and interpretation of data. Training on use of RCRAInfo is provided on a regular basis, usually annually, depending on the nature of system changes and user needs. Even with the increasing emphasis on data quality, with roughly 10,000 units in the baseline (e.g., a facility can have more than one unit), we hear of data problems with some facilities every year, particularly with the older inactive facilities. When we hear of these issues, we work with the EPA Regional offices to see that they get resolved. It may be necessary to make a few adjustments to the permitting baseline as data issues are identified. Determination of whether or not the GPRA annual goal #1 (listed above) is met is based on the legal and operating status codes for each unit. Each year since 1999, in discussions with Regional offices and states, EPA has highlighted the need to keep the data that support the GPRA permitting goal current. RCRAInfo is the sole repository for this information and is a focal point for planning from the local to national level. Accomplishment of goal # 2 (listed above) is based on the permit expiration date code. This is a new code for the new goal and we have made changes to the database to make this code a high priority code. We have discussed the need for correct entry with the Regions. Since tracking this information

is new, we anticipate that we will have to work out some reporting bugs, review the accuracy of tracking when it begins in October 1, 2005, and make adjustments if necessary.

Note: Access to RCRAInfo is open only to EPA Headquarters, Regional, and authorized state personnel. It is not available to the general public because the system contains enforcement sensitive data. The general public is referred to EPA's Envirofacts Data Warehouse to obtain filtered information on RCRA-regulated hazardous waste sites.

**Data Quality Review:** The 1995 GAO report *Hazardous Waste: Benefits of EPA's Information System Are Limited* (AIMD-95-167, August 22, 1995, <http://www.gao.gov/archive/1995/ai95167.pdf>) on EPA's Hazardous Waste Information System reviewed whether national RCRA information systems support EPA and the states in managing their hazardous waste programs. Recommendations coincide with ongoing internal efforts to improve the definitions of data collected, ensure that data collected provide critical information and minimize the burden on states. RCRAInfo, the current national database has evolved in part as a response to this report.

**Data Limitations:** The authorized states have ownership of their data and EPA has to rely on them to make changes. The data that determine if a facility has met its permit requirements are prioritized in update efforts. Basic site identification data may become out-of-date because RCRA does not mandate annual or other periodic notification by the regulated entity when site name, ownership and contact information changes. Nevertheless, EPA tracks the facilities by their IDs and those should not change even during ownership changes. The baselines are composed of facilities that can have multiple units. These units may consolidate, split or undergo other activities that cause the number of units to change. We aim to have static baselines, but there may be occasions where we would need to make minor baseline modifications. The baseline of facilities that are currently tracked for goal #2 are "due for permit renewals," but we anticipate that there will be some facilities that cease to be "due for permit renewals" due to a change in facility status.

**New/Improved Data or Systems:** EPA has successfully implemented new tools in RCRAInfo for managing environmental information to support Federal and state programs, particularly for permit renewals. RCRAInfo allows for tracking of information on the regulated universe of RCRA hazardous waste handlers, such as facility status, regulated activities, and compliance history. The system also captures detailed data on the generation of hazardous waste by large quantity generators and on waste management practices from treatment, storage, and disposal facilities. RCRAInfo is web accessible, providing a convenient user interface for Federal, state and local managers, encouraging development of in-house expertise for controlled cost, and using commercial off-the-shelf software to develop reports from database tables.

**References:** RCRAInfo documentation and data (<http://www.epa.gov/rcrainfo/>). The 1995 GAO report *Hazardous Waste: Benefits of EPA's Information System Are Limited* (AIMD-95-167, August 22, 1995, <http://www.gao.gov/archive/1995/ai95167.pdf>). per capita municipal solid waste generation are based on a series of models, assumptions, and extrapolations and, as such, are not an empirical accounting of municipal solid waste generated or recycled.

**FY 2006 Performance Measures:**

- **Number of confirmed releases at UST facilities nationally.**

- **Percent increase of UST facilities that are in significant operational compliance with both release detection and release prevention (spill, overflow, and corrosion protection requirements).**

**Performance Database:** The Office of Underground Storage Tanks (OUST) does not maintain a national database. States individually maintain records for reporting state program accomplishments.

**Data Source:** Designated State agencies submit semi-annual progress reports to the EPA regional offices.

**QA/QC Procedures:** EPA's regional offices verify and then forward the data in an Excel spreadsheet to OUST. OUST staff examine the data and resolve any discrepancies with the regional offices. The data are displayed in an Excel spreadsheet on a region-by-region basis, which is a way regional staff can check their data.

**Data Limitations:** Percentages reported are sometimes based on estimates and extrapolations from sample data. Data quality depends on the accuracy and completeness of state records.

**References:** FY 2006 Mid-Year Activity Report, June 20, 2006 (updated semiannually [http://www.epa.gov/OUST/cat/ca\\_061\\_2.pdf](http://www.epa.gov/OUST/cat/ca_061_2.pdf)).

### **GOAL 3 OBJECTIVE 2**

#### **FY 2006 Performance Measures:**

- **Number of cleanups that meet state risk-based standards for human exposure and groundwater migration (Tracked as: Number of leaking underground storage tank cleanups completed). (PART performance)**
- **Number of cleanups that meet risk-based standards for human exposure and groundwater migration in Indian country (Tracked as: Number of leaking underground storage tank cleanups completed in Indian Country). (PART performance)**

**Performance Database:** The Office of Underground Storage Tanks (OUST) does not maintain a national database. States individually maintain records for reporting state program accomplishments.

**Data Source:** Designated State agencies submit semi-annual progress reports to the EPA regional offices. The Agency is working to evaluate and update its current LUST efficiency measure with its state partners.

**Methods, Assumptions and Suitability:** The cumulative number of confirmed releases where cleanup has been initiated and where the state has determined that no further actions are currently necessary to protect human health and the environment, includes sites where post-closure monitoring is not necessary as long as site specific (e.g., risk based) cleanup goals have been met. Site characterization, monitoring plans and site-specific cleanup goals must be established and cleanup goals must be attained for sites being remediated by natural attenuation to be counted in this category. (See <http://www.epa.gov/OUST/cat/pm032603.pdf>.)

**QA/QC Procedures:** EPA's regional offices verify and then forward the data in an Excel spreadsheet to OUST. OUST staff examine the data and resolve any discrepancies with the regional offices. The data are displayed in an Excel spreadsheet on a region-by-region basis, which is a way regional staff can check their data.

**Data Limitations:** Data quality depends on the accuracy and completeness of state records.

**References:** FY 2006 Mid-Year Activity Report, June 20, 2006 (updated semiannually [http://www.epa.gov/OUST/cat/ca\\_061\\_2.pdf](http://www.epa.gov/OUST/cat/ca_061_2.pdf)).

**FY 2006 Performance Measures:**

- **Number of Superfund hazardous waste sites with groundwater migration controlled.**
- **Federal Facility Superfund sites with human exposures controlled. (PART measure)**
- **Federal Facility Superfund sites with contaminated groundwater controlled. (PART measure)**
- **Number of final remedies (cleanup targets) selected at Superfund sites. (PART measure)**
- **Number of Superfund final site assessment decisions completed. (PART measure)**
- **Number of Superfund sites with remedy construction completions. (PART measure)**
- **Number of Federal Facility Superfund sites where all remedies have completed construction. (PART measure)**
- **Number of Federal Facility Superfund sites where the final remedial decision for contaminants at the site has been determined. (PART measure)**
- **Program dollars expended annually per operable unit completing clean-up activities. (PART efficiency)**
- **Percentage of Superfund spending that is obligated to individual sites each year. (PART measure)**
- **Voluntary removal actions overseen by EPA and completed annually. (PART performance)**
- **Superfund-lead removal actions completed annually. (PART performance)**
- **Superfund-lead removal actions completed annually per million dollars. (PART efficiency)**

**Performance Database:** The Comprehensive Environmental Response, Compensation, and Liability System (CERCLIS) is the database used by the Agency to track, store, and report Superfund site information.

**Data Source:** CERCLIS is an automated EPA system; headquarters and EPA's Regional offices enter data into CERCLIS on a rolling basis. The Integrated Financial Management System (IFMS) is EPA's financial management system and the official system of record for budget and financial data.

**Methods, Assumptions and Suitability:** Each performance measure is a specific variable within CERCLIS, except for the financial information.

IFMS contains records of all financial transactions (e.g., personnel, contracts, grants, other) of Superfund appropriation resources, as distinguished by U.S. Treasury schedule codes. Procurement data are entered manually into IFMS by Funds Control Officers throughout the Agency. Site-specific obligations are distinguished through the Site/Project field of the IFMS account number that is assigned to every financial transaction.

Total annual obligations include current and prior year appropriated resources, excluding Office of Inspector General (OIG) and Science and Technology transfers. Obligation data are generated using the OCFO Reporting and Business Intelligence Tool (ORBIT), the Agency's system for evaluating IFMS data. Site-specific obligation data are derived using query logic that evaluates the Site/Project field of the IFMS account number. For a given fiscal year, the percentage of appropriated resources that is obligated site-specifically is the result of dividing site-specific annual obligations by total annual obligations.

**QA/QC Procedures:** To ensure data accuracy and control, the following administrative controls are in place: 1) Superfund Program Implementation Manual (SPIM), the program management manual that details what data must be reported; 2) Report Specifications, which are published for each report detailing how reported data are calculated; 3) Coding Guide, which contains technical instructions to such data users as Regional Information Management Coordinators (IMCs), program personnel, report owners, and data input personnel; 4) Quality Assurance (QA) Unit Testing, an extensive QA check against report specifications; 5) Regional CERCLIS Data Entry Internal Control Plan, which includes: (a) regional policies and procedures for entering data into CERCLIS; (b) a review process to ensure that all Superfund accomplishments are supported by source documentation; (c) delegation of authorities for approval of data input into CERCLIS; (d) procedures to ensure that reported accomplishments meet accomplishment definitions; and (6) a historical lockout feature in CERCLIS so that changes in past fiscal year data can be changed only by approved and designated personnel and are logged to a changelog report. Specific direction for these controls is contained in the Superfund Program Implementation Manual (SPIM) Fiscal Year 2006/2007 (<http://www.epa.gov/superfund/action/process/spim06.htm>).

CERCLIS operation and further development is taking place under the following administrative control quality assurance procedures: 1) Office of Environmental Information Interim Agency Life Cycle Management Policy Agency Directive 2100.4 (<http://cfint1.rtpnc.epa.gov/ntsdweb/otop/policies/infoman.cfm>); 2) the Office of Superfund Remediation and Technology Innovation Quality Management Plan ([http://www.epa.gov/swerffrr/pdf/oswer\\_qmp.pdf](http://www.epa.gov/swerffrr/pdf/oswer_qmp.pdf)) 3) Agency platform, software and hardware standards (<http://basin.rtpnc.epa.gov/ntsd/itroadmap.nsf>); 4) Quality Assurance Requirements in all contract vehicles under which CERCLIS is being developed and maintained (<http://www.epa.gov/quality/informationguidelines>); and 5) Agency security procedures (<http://basin.rtpnc.epa.gov/ntsd/ITRoadMap.nsf/Security?OpenView>). In addition, specific controls are in place for system design, data conversion and data capture, and CERCLIS outputs.

The financial data are compliant with the Federal Managers Financial Integrity Act (FMFIA) of 1982 and received FY 2005 FMFIA certification.

**Data Quality Reviews:** Two audits, one by the Office Inspector General (OIG) and the other by Government Accountability Office (GAO), were conducted to assess the validity of the data in CERCLIS. The OIG audit report, *Superfund Construction Completion Reporting* (No.E1SGF7\_05\_0102\_8100030), dated December 30, 1997, was prepared to verify the accuracy of the information that the Agency was providing to Congress and the public. The OIG report concluded that the Agency "has good management controls to ensure accuracy of the information that is reported," and "Congress and the public can rely upon the information EPA provides regarding construction completions." Further information on this report are available at <http://www.epa.gov/oigearth/eroom.htm>. The GAO's report, *Superfund: Information on the*

*Status of Sites* (GAO/RCED-98-241), dated August 28, 1998, was prepared to verify the accuracy of the information in CERCLIS on sites' cleanup progress. The report estimates that the cleanup status of National Priority List (NPL) sites reported by CERCLIS as of September 30, 1997, is accurate for 95 percent of the sites. Additional information on the *Status of Sites* may be obtained at <http://www.gao.gov/archive/1998/rc98241.pdf>. Another OIG audit, *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality* (Report No. 2002-P-00016), dated September 30, 2002, evaluated the accuracy, completeness, timeliness, and consistency of the data entered into CERCLIS. The report provided 11 recommendations to improve controls for CERCLIS data quality. EPA concurs with the recommendations contained in the audit, and many of the identified problems have been corrected or long-term actions that would address these recommendations continue to be underway. Additional information about this report is available at <http://www.epa.gov/oigearth/erom.htm>.

The OIG reviews annually the end-of-year Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) data, in an informal process, to verify the data supporting the performance measures. Typically, there are no published results.

The Quality Management Plan (QMP) for the Office of Solid Waste and Emergency Response (OSWER) was signed in August 2003 ([http://www.epa.gov/swerffrr/pdf/oswer\\_qmp.pdf](http://www.epa.gov/swerffrr/pdf/oswer_qmp.pdf)).

EPA received an unqualified audit opinion by the OIG for the annual financial statements, and the auditor recommended several corrective actions. All recommendations have been implemented by Office of the Chief Financial Officer in IFMS.

**Data Limitations:** Weaknesses were identified in the OIG audit, *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality* (Report No. 2002-P-00016), dated September 30, 2002. The Agency disagrees with the study design and report conclusions; however, the report provided 11 recommendations with which EPA concurs. Many of the identified problems have been corrected or long-term actions that would address these recommendations continue to be underway, e.g., 1) FY 02/03 SPIM Chapter 2 update was made to better define the Headquarters' and Regional roles and responsibilities for maintaining planning and accomplishment data in CERCLIS; 2) FY 04/05 SPIM Appendix A, Section A.A.5 'Site Status Indicators' added language to clarify the use of the non-NPL status code of "SX"; 3) FY 04/05 SPIM Appendix A, Section A.A.6 'Data Quality' added a section on data quality which includes a list of relevant reports; 4) FY 04/05 SPIM Appendix E, Section E.A.5 "Data Owners/Sponsorship" was revised to reflect what data quality checks (focus data studies) will be done by designated Regional and headquarters staff; 5) A data quality objectives supplement for GPRA measures was added in Change 6 to this SPIM. For changes regarding this OIG audit, see the Change Log for this SPIM at <http://www.epa.gov/superfund/action/process/pdfs/changelog6.pdf>; 6) Draft guidance from OCA (Other Cleanup Activity) subgroup, which outlines the conditions under which sites are taken back from states when states have the lead but are not performing; and 7) Pre-CERCLIS Screening: A Data Entry Guide, which provides guidance to the regions for preventing entry of duplicate sites in CERCLIS. The development and implementation of a quality assurance process for CERCLIS data has begun. This process includes delineating quality assurance responsibilities in the program office and periodically selecting random samples of CERCLIS data points to check against source documents in site files.

**Error Estimate:** The GAO's report, *Superfund: Information on the Status of Sites*

(GAO/RECD-98-241), dated August 28, 1998, estimates that the cleanup status of National Priority List sites reported by CERCLIS is accurate for 95 percent of the sites. The OIG report, *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality* (Report No. 2002-P-00016), dated September 30, 2002, states that over 40 percent of CERCLIS data on site actions reviewed was inaccurate or not adequately supported. Although the 11 recommendations were helpful and will improve controls over CERCLIS data, the Agency disagrees and strongly objects to the study design and report conclusions, stating they do not focus on the program's data quality hierarchy and the importance it places on NPL sites.

**New/Improved Data or Systems:** A CERCLIS modernization effort, initiated in 2002, has been completed. As a result of the modernization effort, CERCLIS now has standards for data quality. Each EPA Region's CERCLIS Data Entry Control Plan, which identifies policies and procedures for data entry, is reviewed annually. Data quality audit fields have been added to CERCLIS. EPA Headquarters has begun to create and share with the Regions data quality audit reports. These reports document data quality for timeliness, completeness, and accuracy as determined by the Superfund data sponsors to encourage and ensure high data quality. The modernization effort has increased the availability of CERCLIS data via Superfund eFacts, a Superfund data mart which serves program managers in Headquarters and the Regions. In FY 2008, the program will continue its effort to improve its management of the program through the increased availability of timely and accurate technical information to Superfund's managers. In 2008, the Agency will work to increase utilization of CERCLIS data by incorporating additional remedy selection, risk, removal response, and community involvement data into CERCLIS.

The Business Process Reevaluation task in the modernization project has provided CERCLIS managers with a first step in an implementation evaluation. The document, which resulted from the evaluation, is being used as a valuable resource for scoping the future redesign of CERCLIS as well as the realignment of the database that will remove unnecessary data and add the new data fields that are necessary to manage the Superfund program today. The redesign is mandated to bring CERCLIS into the Agency's Enterprise Architecture. As part of OSRTI's effort to bring CERCLIS into the Agency's Enterprise Architecture all Regional databases have been moved to the National Computing Center in RTP. This is the first step in folding the Headquarters and Regional databases into one database. This move of the databases to RTP is being done without changing the application, by using a commercial off the shelf (COTS) software program to enable the Regional data entry staff to input data over the Agency's Wide Area Network. The initial step of moving the databases to RTP and moving all users to the COTS software has been completed. The move to a single database will be completed during FY 2006 and implemented in FY 2007. The Superfund Document Management System (SDMS) will be linked to CERCLIS. This linkage will enable users to easily transition between programmatic accomplishments reporting and the actual document that defines and describes the accomplishment reported in CERCLIS. The effort to link SDMS and CERCLIS and to consolidate the systems will lead to common reporting (same events and data) in CERCLIS and SDMS. This will be done by electronically extracting data from the documents in SDMS to fill the data fields in CERCLIS - eliminating the manual data entry/human error impacts.

EPA plans to replace IFMS with a new system in FY 2008.

**References:** OIG audit *Superfund Construction Completion Reporting*, (No. E1SGF7\_05\_0102\_8100030) and *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality*, (No. 2002-P-00016, <http://www.epa.gov/oigearth/erom.htm>); and the GAO report, *Superfund*

*Information on the Status of Sites* (GAO/RCED-98-241, <http://www.gao.gov/archive/1998/rc98241.pdf>). The Superfund Program Implementation Manuals for the fiscal years 1987 to the current manual (<http://www.epa.gov/superfund/action/guidance/index.htm>). The Quality Management Plan (QMP) for the Office of Solid Waste and Emergency Response (August 2003, [http://www.epa.gov/swerrrr/pdf/oswer\\_qmp.pdf](http://www.epa.gov/swerrrr/pdf/oswer_qmp.pdf)). Office of Environmental Information Interim Agency Life Cycle Management Policy Agency Directive 2100.4 (<http://cfint1.rtpnc.epa.gov/ntsdweb/otop/policies/infoman.cfm>). The Office of Superfund Remediation and Technology Innovation Quality Management Plan ([http://www.epa.gov/swerrrr/pdf/oswer\\_qmp.pdf](http://www.epa.gov/swerrrr/pdf/oswer_qmp.pdf)). EPA platform, software and hardware standards (<http://basin.rtpnc.epa.gov/ntsd/itroadmap.nsf>). Quality Assurance Requirements in all contract vehicles under which CERCLIS are being developed and maintained (<http://www.epa.gov/quality/informationguidelines>). EPA security procedures (<http://basin.rtpnc.epa.gov/ntsd/ITRoadMap.nsf/Security?OpenView>).

FY 2005 FMFIA Certification 2004 Audited Financial Statements, see <http://www.epa.gov/oig/reports/financial.htm> OIG Audit "EPA Needs to Improve Change Controls for Integrated Financial Management System" dated August 24, 2004 (2004-P-00026).

#### **FY 2006 Performance Measures:**

- **Percentage of RCRA facilities with human exposures to toxins controlled. (PART performance)**
- **Percentage of RCRA facilities with toxic releases to groundwater controlled. (PART performance)**

**Performance Database:** The Resource Conservation Recovery Act Information System (RCRAInfo) is the national database that supports EPA's RCRA program.

**Data Source:** The states and Regions enter data. A "High", "Medium", or "Low" entry is made in the database with respect to final assessment decision. A "yes" or "no" entry is made in the database with respect to meeting the human exposures to toxins controlled and releases to groundwater controlled indicators. An entry will be made in the database to indicate the date when a remedy is selected and the complete construction of a remedy is made. Supporting documentation and reference materials are maintained in the Regional and state files. EPA's Regional offices and authorized states enter data on a continual basis. For the efficiency measure, federal and state cost data are assembled from their respective budgets. Private sector costs are derived from data published in the Environmental Business Journal.

**Methods, Assumptions and Suitability:** RCRAInfo contains information on entities (generically referred to as "handlers") engaged in hazardous waste (HW) generation and management activities regulated under the portion of RCRA that provides for regulation of hazardous waste. Within RCRAInfo, the Corrective Action Module tracks the status of facilities that require, or may require, corrective actions, including information related to the four measures outlined above. Performance measures are used to summarize and report on the facility-wide environmental conditions at the RCRA Corrective Action Program's highest-priority facilities. The environmental indicators are used to track the RCRA Corrective Action Program's progress in getting highest-priority contaminated facilities under control. Known and suspected facility-wide conditions are evaluated using a series of simple questions and flow-chart logic to arrive at a reasonable, defensible determination. These questions were issued as a memorandum titled: *Interim Final Guidance for RCRA Corrective Action Environmental*

*Indicators, Office of Solid Waste, February 5, 1999*). Lead regulators for the facility (authorized state or EPA) make the environmental indicator determination, but facilities or their consultants may assist EPA in the evaluation by providing information on the current environmental conditions. The complete constructions of remedies measure is used to track the RCRA program's progress in getting its highest-priority contaminated facilities moving towards final cleanup. Like with the environmental indicators determination, the lead regulators for the facility select the remedy and determine when the facility has completed construction of that remedy. Construction completions on an area-wide, i.e., not site-wide, basis are collected for the efficiency measure.

**QA/QC Procedures:** States and Regions generate the data and manage data quality related to timeliness and accuracy (i.e., the environmental conditions and determinations are correctly reflected by the data). Within RCRAInfo, the application software enforces structural controls that ensure that high-priority national components of the data are properly entered. RCRAInfo documentation, which is available to all users on-line, provides guidance to facilitate the generation and interpretation of data. Training on use of RCRAInfo is provided on a regular basis, usually annually, depending on the nature of systems changes and user needs.

**Note:** Access to RCRAInfo is open only to EPA Headquarters, Regional, and authorized state personnel. It is not available to the general public because the system contains enforcement sensitive data. The general public is referred to EPA's Envirofacts Data Warehouse to obtain filtered information on RCRA-regulated hazardous waste facilities.

**Data Quality Review:** GAO's 1995 Report on EPAs Hazardous Waste Information System ([http://www.access.gpo.gov/su\\_docs/fdlp/pubs/study/studyhtm.html](http://www.access.gpo.gov/su_docs/fdlp/pubs/study/studyhtm.html)) reviewed whether national RCRA information systems support EPA and the states in managing their hazardous waste programs. Recommendations coincide with ongoing internal efforts (WIN/Informed) to improve the definitions of data collected, ensure that data collected provide critical information and minimize the burden on states. EPA's Quality Staff of Office of Environmental Information conducted a quality systems audit in December 2003. The audit found the corrective action program satisfactory.

**Data Limitations:** No data limitations have been identified for the performance measures. As discussed above, the performance measure determinations are made by the authorized states and EPA Regions based on a series of standard questions and entered directly into RCRAInfo. EPA has provided guidance and training to states and Regions to help ensure consistency in those determinations. High priority facilities are monitored on a facility-by-facility basis and the QA/QC procedures identified above are in place to help ensure data validity. For the efficiency measure, private sector costs are not publicly available. Estimates of these costs are derived from Environmental Business Journal data.

**New/Improved Data or Systems:** EPA has successfully implemented new tools for managing environmental information to support federal and state programs, replacing the old data systems (the Resource Conservation and Recovery Information System and the Biennial Reporting System) with RCRAInfo. RCRAInfo allows for tracking of information on the regulated universe of RCRA hazardous waste handlers, such as facility status, regulated activities, and compliance history. The system also captures detailed data on the generation of hazardous waste from large quantity generators and on waste management practices by treatment, storage, and disposal facilities. RCRAInfo is web-accessible, providing a convenient user interface for federal, state and local managers, encouraging development of in-house expertise for controlled cost, and using commercial off-the-shelf software to develop reports from database tables.

**References:** GAO's 1995 Report on EPA's Hazardous Waste Information System reviewed whether national RCRA information systems support EPA and the states in managing their hazardous waste programs. This historical document is available on the Government Printing Office Website ([http://www.access.gpo.gov/su\\_docs/fdlp/pubs/study/studyhtm.html](http://www.access.gpo.gov/su_docs/fdlp/pubs/study/studyhtm.html)).

**FY 2006 Performance Measures:**

- **Number of inspections and exercises conducted at oil storage facilities required to have Facility Response Plans.**
- **Compliance rate of inspected facilities subject to SPCC regulations. (PART performance)**
- **Compliance rate of inspected facilities subject to FRP regulations. (PART performance)**
- **Oil spills responded to or monitored by EPA.**

**Performance Database:** The EPA Annual Commitment System (ACS) in BAS is the database for the number of inspections/exercises at SPCC and FRP facilities. Using data submitted directly by Regional staff as well as data in ACS, Office of Emergency Management (OEM) tracks in a spreadsheet national information about Regional activities at FRP facilities. Data about gallons of oil spilled are maintained in a National Response Center (NRC) database that reflects information reported to the NRC by those responsible for individual oil spills.

**Data Source:** Data concerning inspections/exercises at FRP and SPCC facilities are provided by Regional staff. Data concerning gallons of oil spilled to navigable waters are gathered from the publicly available National Response Center database. Data about program expenditures are provided by EPA HQ and Regional staff.

**Methods, Assumptions and Suitability:** The spill/exercise data are entered by Regional staff experienced in data entry. In every case, direct data (rather than surrogates open to interpretation) are entered.

**QA/QC Procedures:** Data are regularly compared to similar data from the past to identify potential errors.

**Data Quality Reviews:** EPA regularly reviews recent data, comparing them to data gathered in the past at similar times of year and in the same Regions. Any questionable data are verified by direct contact with the Regional staff responsible for providing the data.

**Data Limitations:** The NRC data will reflect the extent to which those responsible for oil spills accurately report them to the NRC.

**Error Estimate:** Data reported by the Regions should be relatively free of error. There may be some error in the NRC data, due to the fact that some spills might not be reported and/or some spills might be reported by more than one person. NRC and EPA procedures should identify multiple reports of the same spill, but it is not usually possible to identify an unreported spill.

**New/Improved Data or Systems:** There are no current plans to develop a dedicated system, to manage the various data.

**References:** For additional information on the Oil program, see [www.epa.gov/oilspill](http://www.epa.gov/oilspill)

### GOAL 3 OBJECTIVE 3

#### **FY 2006 Performance Measures:**

- **Refer to DOJ, settle, or writeoff 100 percent of Statute of Limitations (SOLs) cases for Superfund sites with total unaddressed past costs equal to or greater than \$200,000 and report value of costs recovered.**
- **Reach a settlement or take an enforcement action before the start of a remedial action at 90 percent of Superfund sites having viable, liable responsible parties other than the Federal government.**

**Performance Database:** The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database contains information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation. The database includes sites that are on the National Priorities List (NPL) or being considered for the NPL.

**Data Source:** Automated EPA system; Headquarters and EPA's Regional Offices enter data into CERCLIS.

**Methods, Assumptions and Suitability:** There are no analytical or statistical methods used to collect the information. The performance data collected on a fiscal year basis only. Enforcement reports are run at the end of the fiscal year, and the data that support this measure are extracted from the report.

**QA/QC Procedures:** To ensure data accuracy and control, the following administrative controls are in place: 1) Superfund Program Implementation Manual (SPIM), the program management manual that details what data must be reported; 2) Report Specifications, which are published for each report detailing how reported data are calculated; 3) Coding Guide, which contains technical instructions to such data users as Regional Information Management Coordinators (IMCs), program personnel, report owners, and data input personnel; 4) Quality Assurance (QA) Unit Testing, an extensive QA check against report specifications; 5) Regional CERCLIS Data Entry Internal Control Plan, which includes: (a) regional policies and procedures for entering data into CERCLIS; (b) a review process to ensure that all Superfund accomplishments are supported by source documentation; (c) delegation of authorities for approval of data input into CERCLIS; (d) procedures to ensure that reported accomplishments meet accomplishment definitions; and (6) a historical lockout feature in CERCLIS so that changes in past fiscal year data can be changed only by approved and designated personnel and are logged to a changelog report. Specific direction for these controls is contained in the Superfund Program Implementation Manual (SPIM) Fiscal Year 2006/2007 (<http://www.epa.gov/superfund/action/process/spim06.htm>).

CERCLIS operation and further development is taking place under the following administrative control quality assurance procedures: 1) Office of Environmental Information Interim Agency Life Cycle Management Policy Agency Directive 2100.4 (<http://cfint1.rtpnc.epa.gov/ntsdweb/otop/policies/infoman.cfm>); 2) the Office of Superfund Remediation and Technology Innovation Quality Management Plan ([http://www.epa.gov/swerffrr/pdf/oswer\\_qmp.pdf](http://www.epa.gov/swerffrr/pdf/oswer_qmp.pdf)) 3) Agency platform, software and hardware standards (<http://basin.rtpnc.epa.gov/ntsd/itroadmap.nsf>); 4) Quality Assurance Requirements in all contract vehicles under which CERCLIS is being developed and maintained (<http://www.epa.gov/quality/informationguidelines>); and 5) Agency security procedures (<http://basin.rtpnc.epa.gov/ntsd/ITRoadMap.nsf/Security?OpenView>). In addition, specific

controls are in place for system design, data conversion and data capture, and CERCLIS outputs.

**Data Quality Review:** The OIG annually reviews the end-of-year CERCLIS data, in an informal process, to verify the data supporting the performance measure. Typically, there are no published results.

**References:** Office of Site Remediation Enforcement (OSRE) Quality Management Plan, approved April 11, 2001.

**FY 2006 Performance Measure: Draft of FY05 Annual SITE Report to Congress.**

**Performance Database:** Program output; no internal tracking system

#### **GOAL 4 OBJECTIVE 1**

**FY 2006 Performance Measure: Cumulative number of assays that have been validated. (PART Measure)**

**Performance Database:** Performance is measured by the cumulative number of assays validated by the projected completion date of FY 2009. The completion of the validation process for an assay can take several years. The measure includes assays being considered as candidates for both Tier 1 screening and Tier 2 testing. Tier 1 will be comprised of a battery of screening assays that will identify substances that have potential to interact with the endocrine system. Tier 2 assays will be used to test for specific effects caused by a chemical and to establish the dose at which the effect occurs. The measure appears as a fraction where the numerator represents the total number of cumulative assays completed for the current year and the denominator represents the number of assays planned. Assay validation consists of a number of intermediate steps (preparation of Detailed Review Papers, conduct of prevalidation studies, conduct of interlaboratory validation studies, and conduct of peer review). While not included as PART Measures, Excel spreadsheets are used to capture and track these intermediate stages within the validation process.

**Data Source:** Data are generated to support all stages of assay validation through contracts, grants and interagency agreements, and the cooperative support of the Organization of Economic Cooperation and Development (OECD), and EPA's Office of Research and Development (ORD). The scope of the effort includes the conduct of laboratory studies and associated analyses to validate the assays proposed for the Endocrine Disruptor Screening Program (EDSP).

**Methods, Assumptions, and Suitability:** The measure represents the program's progress toward completing the validation of endocrine test methods. These methods when finalized, will help to ensure that EPA meets The Food Quality Protection Act of 1996 (FQPA) requirement that EPA validate assays to screen chemicals for their potential to affect the endocrine system. Currently, 21 assays are being developed and validated.

**QA/QC Procedures:** EDSP's contractors operate independent quality assurance units (QAUs) to ensure that all studies being used to validate an assay (i.e., prevalidation and inter-laboratory validation) are conducted under appropriate QA/QC programs. Two levels of QA/QC are employed. First, the contractors operate under a Quality Management Plan designed to ensure overall quality of performance under the contracts. Second, prevalidation and validation studies

are conducted under a project-specific Quality Assurance Project Plans (QAPPs) developed by the contractor and approved by EPA. These QAPPs are specific to the study being conducted. Most validation studies are conducted according to Good Laboratory Practices (GLPs). In addition, EPA or its agent conducts an independent lab/QA audit of facilities participating in the validation program.

**Data Quality Review:** All of the documentation and data generated by the contractors, OECD and ORD, as it pertains to the EDSP, are reviewed for quality and scientific applicability. The contractor maintains a Data Coordination Center which manages information/data generated under EDSP. The contractor also conducts statistical analyses related to lab studies, chemical repository, and quality control studies.

**Data Limitations:** There is a data lag of approximately 9-24 months due to the variation in length and complexity of the lab studies (i.e., prevalidation or interlaboratory) required for assay validation, and for time required for review, analysis and reporting of data.

**References:** EPA Website; EPA Annual Report; Endocrine Disruptor Screening Program Proposed Statement of Policy, Dec. 28, 1998; Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC) Final Report (EPA/743/R-98/003); EPA Contract # 68-W-01-023.

**FY 2006 Performance Measures:**

- **Number of registrations of reduced risk pesticides registered (Register safer chemicals and biopesticides) (cumulative).**
- **Number of new (active ingredients) conventional pesticides registered (New Chemicals) (Cumulative).**
- **Number of conventional new uses registered (New Uses) (Cumulative).**
- **Maintain timeliness of Section 18 Emergency Exemption Decisions.**
- **Percent reduction in review time for registration of conventional chemicals. (PART efficiency measure)**
- **Reduce registration decision times for reduced risk chemicals.**

**Performance Database:** The OPPIN (Office of Pesticide Programs Information Network) consolidates various pesticides program databases. It is maintained by the EPA and tracks regulatory data submissions and studies, organized by scientific discipline, which are submitted by the registrant in support of a pesticide's registration. In addition to tracking decisions in OPPIN, manual counts are also maintained by the office on the registrations of reduced risk pesticides. Results for reduced risk pesticides, new active conventional ingredients, and new uses have been reported since 1996. The results are calculated on a fiscal year (FY) basis. For antimicrobial new uses, results have been reported since FY 2004 on a FY basis. Both S18 timeliness and reduced risk decision times were reported on a FY basis for the first time in FY 2005.

**Data Source:** Pesticide program reviewers update the status of the submissions and studies as they are received and as work is completed by the reviewers. The status indicates whether the application is ready for review, the application is in the process of review, or the review has been completed.

**Methods, Assumptions and Suitability:** The measures are program outputs which when

finalized, represent the program's statutory requirements to ensure that pesticides entering the marketplace are safe for human health and the environment, and when used in accordance with the packaging label present a reasonable certainty of no harm. While program outputs are not the best measures of risk reduction, registration outputs do provide a means for reducing risk by ensuring that pesticides entering the marketplace meet the latest health standards, and as long as used according to the label are safe.

**QA/QC Procedures:** A reduced risk pesticide must meet the criteria set forth in Pesticide Registration Notice 97-3, September 4, 1997. Reduced risk pesticides include those which reduce the risks to human health; reduce the risks to non-target organisms; reduce the potential for contamination of groundwater, surface water or other valued environmental resources; and/or broaden the adoption of integrated pest management strategies, or make such strategies more available or more effective. In addition, biopesticides are generally considered safer (and thus reduced risk). All registration actions must employ sound science and meet the Food Quality Protection Act (FQPA) new safety standards. All risk assessments are subject to public and scientific peer review. The office adheres to its Quality Management Plan (May 2000) in ensuring data quality and that procedures are properly applied.

**Data Quality Review:** These are program outputs. EPA staff and management review the program outputs in accordance with established policy for the registration of reduced-risk pesticides as set forth in Pesticide Regulation Notice 97-3, September 4, 1997.

**Data Limitations:** None. All required data must be submitted for the risk assessments before the pesticide is registered. If data are not submitted, the pesticide is not registered. As stated above, a reduced risk pesticide must meet the criteria set forth in PRN 97-3 and all registrations must meet FQPA safety requirements. If a pesticide does not meet these criteria, it is not registered. If an application for a reduced risk pesticide does not meet the reduced risk criteria, it is reviewed as a conventional active ingredient.

**New/Improved Data or Systems:** The OPPIN (Office of Pesticide Programs Information Network), which consolidates various pesticides program databases, will reduce the processing time for registration actions.

**References:** FIFRA Sec 3(c)(5); FFDCA Sec 408(a)(2); EPA Pesticide Registration Notice 97-3, September 4, 1997; Food Quality Protection Act (FQPA) 1996; OPP Quality Management Plan, May 2000; Endangered Species Act.

**FY 2006 Performance Measures:**

- **Cumulative percent of Reregistration Eligibility Decisions (REDs) completed. (PART measure)**
- **Number of Product Reregistration decisions issued.**
- **Reduction in time required to issue Reregistration Eligibility Decisions. (PART efficiency measure)**
- **Number of Tolerance Reassessments issued. (PART measure)**
- **Tolerance Reassessments for top 20 foods eaten by children. (PART measure)**

**Performance Database:** The OPPIN (Office of Pesticide Programs Information Network) consolidates various EPA program databases. It is maintained by the EPA and tracks regulatory data submissions and studies, organized by scientific discipline, which are submitted by the registrant in support of a pesticide's reregistration. In addition to tracking decisions in OPPIN,

manual counts are also maintained by the office on the reregistrations decisions. Decisions are logged in as the action is completed, both for final decisions and interim decisions. REDs and product reregistration decisions have been reported on a FY basis since FY 1996. Reduction in decision times for REDs will be reported on an FY basis in FY 2005. Reduction in cost per RED will be reported in FY 2008.

For this measure, the number of FTEs is the surrogate for cost. The baseline is 11.5 FTEs per reregistration decision completed. The measure is derived by taking the total FTE devoted to reregistration activities, as reported in OPP's Time Accounting Information System (TAIS), divided by the number of reregistration decisions completed.

**Data Source:** EPA's Pesticides Program staff and managers.

**Methods, Assumptions and Suitability:** The measures are program outputs which represent the program's statutory requirements to ensure that pesticides entering the marketplace are safe for human health and the environment and when used in accordance with the packaging label present a reasonable certainty of no harm. While program outputs are not the best measures of risk reduction, they do provide a means for reducing risk in that the program's safety review prevents dangerous pesticides from entering the marketplace.

**QA/QC Procedures:** All registration actions must employ sound science and meet the Food Quality Protection Act (FQPA) new safety standards. All risk assessments are subject to public and scientific peer review. The office adheres to the procedures for quality management of data as outlined in its QMP approved May 2000.

**Data Quality Review:** Management reviews the program counts and signs off on the decision document.

**New/Improved Data or Systems:** The OPPIN, which consolidates various pesticides program databases, will contribute to reducing the processing time for reregistration actions.

**References:** EPA Website <http://www.epa.gov/pesticides> EPA Annual Report 2002 EPA Number 735-R-03-001; 2003 Annual Performance Plan OPP Quality Management Plan, May 2000; Endangered Species Act.

**FY 2006 Performance Measure: Number of chemicals with proposed, interim and/or final values for Acute Exposure Guideline Levels (AEGLs). (PART measure)**

**Performance Database:** There is no database. Performance is measured by the cumulative number of chemicals with "Proposed", "Interim", and/or "Final" AEGL values as published by the National Academy of Sciences (NAS). The results are calculated on a fiscal year basis.

**Data Source:** EPA manages a Federal Advisory Committee Act (FACA) committee that reviews short term exposure values for extremely hazardous chemicals. The supporting data, from both published and unpublished sources and from which the AEGL values are derived, are collected, evaluated, and summarized by FACA Chemical Managers and Oak Ridge National Laboratory's scientists. Proposed AEGL values are published for public comment in the Federal Register. After reviewing public comment, interim values are presented to the AEGL Subcommittee of the National Academy of Sciences (NAS) for review and comment. After review and comment resolution, the National Research Council under the auspices of the National Academy of Sciences (NAS) publishes the values as final.

**Methods, Assumptions, and Suitability:** The work of the National Advisory Committee's Acute Exposure Guideline Levels (NAC/AEGL, formally chartered under the Federal Advisory Committee Act) adheres to the 1993 U.S. National Research Council/National Academies of Sciences (NRC/NAS) publication *Guidelines for Developing Community Emergency Exposure Levels for Hazardous Substances*. NAC/AEGL, in cooperation with the National Academy of Sciences' Subcommittee on AEGLs, have developed standard operating procedures (SOPs), which are followed by the program. These have been published by the National Academy Press and are referenced below. The cumulative number of AEGL values approved as "proposed" and "interim" by the NAC/AEGL FACA Committee and "final" by the National Academy of Sciences represents the measure of performance. The work is assumed to be completed at the time of final approval of the AEGL values by the NAS. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 min to 8 h. Three levels—AEGL\_1, AEGL\_2, and AEGL\_3—are developed for each of five exposure periods (10 min, 30 min, 1 h, 4 h, and 8 h) and are distinguished by varying degrees of severity of toxic effects (detection, disability, and death respectively). They provide a high degree of flexibility for their use in chemical emergency response, planning, and prevention for accidental or terrorist releases of chemicals. The AEGL Program pools the resources of US and international stakeholders with needs for this information in a cost effective program which develops one set of numbers for use by all stakeholders (DOD, DOT, DOE, States, The Netherlands and others in the international community).

**QA/QC Procedures:** QA/QC procedures include public comment via the Federal Register process; review and approval by the FACA committee; and review and approval by the NAS/AEGL committee and their external reviewers.

**New/Improved Data or Systems:** This is the first time acute exposure values for extremely hazardous chemicals have been established according to a standardized process and put through such a rigorous review.

**References:** Standing Operating Procedures for Developing Acute Exposure Guideline Levels for Hazardous Chemicals, National Academy Press, Washington, DC 2001 (<http://www.nap.edu/books/030907553X/html/>)(last accessed 7/28/06). NRC (National Research Council). 1993. *Guidelines for Developing Community Emergency Exposure Levels for Hazardous Substances*. Washington, DC: National Academy Press. AEGL Program website at <http://www.epa.gov/oppt/aegl> (last accessed 7/28/06)/

**FY 2006 Performance Measure: Number of new chemicals or microorganisms introduced into commerce that pose an unreasonable risk to workers, consumers or the environment. (PART measure)**

**Performance Database:** Implementation of this measure will require the use of several EPA databases: Confidential Business Information Tracking System (CBITS), pre-manufacture notice (PMN) CBI Local Area Network (LAN), 8(e) database (ISIS), and the Focus database. The following information from these databases will be used collectively in applying this measure:

- CBITS: Tracking information on Pre-Manufacture Notices (PMNs) received;
- PMN CBI LAN: Records documenting PMN review and decision, assessment reports on chemicals submitted for review. In addition, the information developed for each PMN is kept in hard copy in the Confidential Business Information Center (CBIC);
- ISIS: Data submitted by industry under the Toxic Substances Control Act (TSCA) Section 8(e). TSCA 8(e) requires that chemical manufacturers, processors, and distributors notify EPA

immediately of new (e.g. not already reported), unpublished chemical information that reasonably supports a conclusion of substantial risk. TSCA 8(e) substantial risk information notices most often contain toxicity data but may also contain information on exposure, environmental persistence, or actions being taken to reduce human health and environmental risks. It is an important information-gathering tool that serves as an early warning mechanism;

- Focus: Rationale for decisions emerging from Focus meeting, including decisions on whether or not to drop chemicals from further review.

Measurement results are calculated on a fiscal-year basis and draw on relevant information received over the 12-month fiscal year.

**Data Source:** The Office of Pollution Prevention and Toxics (OPPT), the office responsible for the implementation of the TSCA, will compare data submitted under TSCA Section 8(e) with previously-submitted new chemical review data (submitted under TSCA Section 5 and contained in the PMN) to determine the number of instances in which EPA's current PMN Review practices would have failed to prevent the introduction of new chemicals or microorganisms into commerce which pose an unreasonable risk to workers, consumers or the environment. Inconsistencies between the 8(e) and previously-submitted new chemical review data will be evaluated by applying the methods and steps outlined below to determine whether the inconsistencies signify an "unreasonable risk."

**Methods, Assumptions, and Suitability:** EPA's methods for implementing this measure involve determining whether EPA's current PMN Review practices would have failed to prevent the introduction of chemicals or microorganisms into commerce that pose an unreasonable risk to workers, consumers or the environment, based on comparisons of 8(e) and previously-submitted new chemical review data. The "unreasonable risk" determination is based on consideration of (1) the magnitude of risks identified by EPA, (2) limitations on risk that result from specific safeguards applied, and (3) the benefits to industry and the public expected to be provided by the new chemical substance. In considering risk, EPA looks at anticipated environmental effects, distribution and fate of the chemical substance in the environment, patterns of use, expected degree of exposure, the use of protective equipment and engineering controls, and other factors that affect or mitigate risk. These are the steps OPPT will follow in comparing the 8(e) data with the previously-submitted new chemical review data.

1. Match all 8(e) submissions in the 8(e) database with associated TSCA Section 5 notices. TSCA Section 5 requires manufacturers to give EPA a 90-day advance notice (via a pre-manufacture notice or PMN) of their intent to manufacture and/or import a new chemical. The PMN includes information such as specific chemistry identity, use, anticipated production volume, exposure and release information, and existing available test data. The information is reviewed through the New Chemicals Program to determine whether action is needed to prohibit or limit manufacturing, processing, or use of a chemical.
2. Characterize the resulting 8(e) submissions by the PMN review phase. For example, whether the 8(e) submissions were received: a) before the PMN notice was received by EPA, b) during the PMN review process, or c) after the PMN review was completed.
3. Review of 8(e) data will focus on 8(e)s received after the PMN review period was completed.
4. Comparison of hazard evaluation developed during PMN review with associated 8(e) submission.
5. Report on the accuracy of the initial hazard determination.
6. Revised risk assessment developed to determine if there was an unreasonable risk based on established risk assessment and risk management guidelines and whether current PMN Review practices would have detected and prevented that risk.

The databases used and the information retrieved are directly applicable to this measurement and therefore suitable for measurement purposes.

**QA/QC Procedures:** OPPT has in place a signed Quality Management Plan (“Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances;” June 2003) and will ensure that those standards and procedures are applied to this effort.

**Data Quality Reviews:** This is a new performance measure and, therefore, there is no developed track record of review and correction. However, appropriate oversight of the measurement process will be provided. Information developed in the course of measurement will be presented to senior management within OPPT to address potential concerns related to technical outcomes and to provide quality oversight. In addition, the National Pollution Prevention and Toxics Advisory Council (NPPTAC), which consists of external experts providing independent review and direction to OPPT, has provided comment on this measure.

**Data Limitations:** There are some limitations of EPA’s review which result from differences in the quality and completeness of 8(e) data provided by industry; for example, OPPT cannot evaluate submissions that do not contain adequate information on chemical identity. The review is also affected in some cases by a lack of available electronic information. In particular the pre-1996 PMN cases are only retrievable in hard copy and may have to be requested from the Federal Document Storage Center. This may introduce some delays to the review process.

**Error Estimate:** Not applicable. This measure does not require inferences from statistical samples and therefore there is no estimate of statistical error. OPPT will review all 8(e) submissions received in the year with corresponding previously-submitted new chemical review data, and not a sample of such submissions.

**New/Improved Data or Systems:** OPPT is currently developing an integrated, electronic system that will provide real time access to prospective PMN review.

**References:** OPPT New Chemicals Program

<http://www.epa.gov/opptintr/newchems/>, TSCA Section 8(e) – Substantial Risk

<http://www.epa.gov/opptintr/chemtest/sect8e.htm>,

<http://www.epa.gov/opptintr/tsc8e/index/htm>

“Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances;” June 2003.

**FY 2006 Performance Measure: Percent change relative to base year in cost savings from new chemical prescreening. (PART measure)**

**Performance Database:** Implementation of this measure will require the use of several EPA databases, all of which play a role in tracking premanufacture notices (PMNs) and the action EPA decides to take on such notices. The principal databases involved in PMN tracking, with separate identification of prescreened chemicals, are:

- Chemical Control Division tracking database: Records basic identifying and status information on each PMN submitted to EPA, including name of submitter, identity of technical contact at company, and actions taken by EPA. Enables chemicals to be tracked quickly and easily through the PMN review process.

- Management Information Tracking System (MITS): Contains non-CBI data on all PMNs, including chemical identification and actions taken by EPA.
- New Chemicals Focus meeting database: Contains information on the decisions reached at Focus meetings, including whether to drop chemical from further review, to pursue regulation under the Toxic Substances Control Act (TSCA) Section 5(e) to prohibit or limit activities associated with the new chemical or to pursue regulation under a non-5(e) Significant New Use Rule (SNUR) to require manufacturers, importers and processors to notify EPA at least 90 days before beginning any activity that EPA has designated as a “significant new use,” or, alternatively, to refer the chemical for full-scale standard review. It is critical to know the number and percentage of PMNs going to these outcomes in order to perform base year cost savings calculations in support of the cost savings measure.
- Sustainable Futures prescreening tracking databases: Contain information on PMNs which display evidence of chemical prescreening using OPPT screening methods, including data on the types of assessments and model evaluations performed by the submitter, and contact information on Sustainable Futures participants including date(s) attended EPA training.
- Measurement results are calculated on a fiscal year basis and draw upon relevant information collected over the 12-month fiscal year.

**Data Source:** The major data sources involved in this measurement are fully described under “Performance Database,” above. No external data sources play a significant role in the calculation of measurement results.

**Methods, Assumptions and Suitability:** EPA measures percent change in cost savings as a result of chemical prescreening relative to a base year by: 1) determining the base year prescreening rate and base year cost savings; 2) calculating the current year prescreening rate (prescreened PMNs as a percentage of total PMNs) and; 3) determining the actual percent change in cost savings due to prescreening by multiplying the base year cost savings by the ratio of the current year prescreening rate to the base year prescreening rate. Finally, the actual percent change in cost savings relative to the base year can be compared to the target percent change of 6.67 percent. This procedure assumes, quite reasonably, that cost savings from prescreening will generally change in rough proportion to the change in the prescreening rate.

The methods used in calculating base year information are as follows:

- Determine base year prescreening rate by checking the data systems described above to obtain the number of new prescreened chemicals going through the PMN review process and the total number of chemicals undergoing such review. The prescreening rate is simply the ratio of prescreened chemicals to total chemicals undergoing PMN review.

Determine base year cost savings by:

- Checking the relevant databases to determine the number and percentage of base year PMNs that are (a) prescreened PMNs and (b) non-prescreened PMNs.

- Estimating the number of prescreened PMNs that would have gone to regulation or standard review if there were no prescreening program (this is done by multiplying the number of prescreened PMNs by the percentage of non-prescreened PMNs that go to one of the “post-Focus meeting outcomes“ of standard review, regulation under TSCA Section 5(e), or issuance of a non-5(e) SNUR).
- Subtracting the number of actual prescreened PMNs going to one of the post-Focus meeting outcomes from the projected number derived in the previous step, is the estimated number of PMNs avoiding a post-Focus meeting outcome. The rationale is that some pre-screened PMNs still end up requiring post-Focus action, but at a lower rate than for PMNs which are not pre-screened. The hypothetical number estimated in this step, the difference between the projected and actual numbers of pre-screened PMNs requiring a post-Focus meeting outcome, represents the number of cases to have avoided post-Focus action as a result of pres-screening.
- Multiplying the number of cases estimated to have avoided post-Focus action as a result of pre-screening by unit cost factors to obtain estimates of the cost savings realized by avoidance of post-Focus meeting outcomes due to prescreening. (unit cost factors are generated separately from information/estimates maintained by EPA on the labor hours (Agency and contractor) associated with each post-Focus meeting outcome and the EPA cost per labor hour).
- Summing the cost savings realized by avoidance of specified post-Focus meeting outcomes to arrive at total cost savings for the base year.

**QA/QC Procedures:** OPPT has in place a signed Quality Management Plan (“Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances,” June 2003) and will ensure that those standards and procedures are applied to this effort.

**Data Quality Reviews:** This is a new performance measure and, therefore, there is no developed record of review and correction. However, appropriate oversight of the measurement process will be provided. Information developed in the course of measurement will be presented to senior management within OPPT to address potential concerns related to technical outcomes and to provide quality oversight.

**Data Limitations:** No specific data limitations have been identified with respect to the measure presented here, except to the extent that the measure requires certain assumptions, discussed above, in addition to inputs of hard data.

**New/Improved Data or Systems:** OPPT is currently developing an integrated electronic system that will provide real time access to prospective PMN review.

**References:** Additional information on EPA’s New Chemicals program for TSCA Section 5 can be found at <http://www.epa.gov/oppt/newchemicals/index.htm>.

**FY 2006 Performance Measure: Percentage of High Production Volume (HPV) chemicals identified as priority concerns through assessment of Screening Information Data Set (SIDS) and other information with risks eliminated or effectively managed.**

**Performance Database:** EPA will track the number of agency actions (e.g., regulatory, voluntary), targeting risk elimination or management of high production volume chemicals, using internal program databases or the Agency's Regulation and Policy Information Data System (RAPIDS). Many types of Agency actions qualify as risk management or elimination actions. Issuance of a Significant New Use Rule (SNUR) under TSCA is an example of regulatory action that can be tracked by the RAPIDS Promulgation Data field. An example of a non-regulatory risk management/elimination action is a written communication from EPA to chemical manufacturers/users indicating the Agency's concerns and suggesting but not requiring actions to address chemical risks (chemical substitution, handling protections, etc.). These actions would be tracked by monitoring internal communications files. The results are calculated on a calendar-year basis.

**Data Source:** RAPIDS stores official Agency data on progress of rule-making and other policy program development efforts. Data are supplied by EPA programs managing these efforts. For voluntary actions not tracked in RAPIDS, performance data are tracked internally by program managers.

**Methods, Assumptions and Suitability:** As EPA identifies HPV chemicals that are priorities for risk management action, following protocols currently under development, the Agency will commence regulatory or non-regulatory actions to address identified risks. All such actions will be recorded for the HPV chemical(s) subject to those actions, enabling EPA to report on progress in responding to unreasonable risks on a chemical- or chemical-category-specific basis. This annual performance measures (APM) commits the Agency to eliminate or effectively manage all such risks. Using data contained in RAPIDS, in the case of regulatory risk management action, EPA's progress towards meeting this APM will be documented by the sequence of formal regulatory development steps documented in that system. Where risk management action takes nonregulatory form, such as issuance of advisory communications to chemical manufacturers or users, progress toward meeting this APM will be tracked by internal files documenting such actions. The definition of risk is being addressed in the development of the protocols used in the HPV screening/prioritization process.

**QA/QC Procedures:** RAPIDS entries are quality assured by senior Agency managers.

**Data Quality Reviews:** RAPIDS entries are reviewed by EPA's Regulatory Management Staff.

**FY 2006 Performance Measure: The cumulative number of chemicals for which VCCEP data needs documents are issued by EPA in response to industry-sponsored Tier I risk assessments.**

**Performance Database:** Internal VCCEP program activity tracking database. Data needs documents are issued by EPA to conclude work on all Tier I submissions. Documents may indicate data are sufficient to reasonably demonstrate that children are not subject to significant risks. Documents also may indicate that additional assessment and associated data development are required, commencing Tier 2 work. The results are calculated on a calendar-year basis.

**Data Source:** Formal EPA files of VCCEP Tier I data needs communications. Data needs are also subject to peer review, results of which are posted and made public on the Toxicology Excellence for Risk Assessment website found at <http://www.tera.org/peer/MeetingReports.html>

**Methods, Assumptions and Suitability:** Information is tracked directly through internal record-keeping systems. No models or assumptions or statistical methods are employed.

**QA/QC Procedures:** The VCCEP program operates under Information Quality Guidelines as found at <http://www.epa.gov/quality/informationguidelines/>

**Data Quality Reviews:** The VCCEP program operates under Information Quality Guidelines as found at <http://www.epa.gov/quality/informationguidelines/>

**References:** <http://www.epa.gov/chemrtk/vccep/index.htm> (last accessed 7/28/06)

**FY 2006 Performance Measure: Reduction in the current year production-adjusted risk-based score of releases and transfers of toxic chemicals (PART Measure).**

**Performance Database:** The Risk Screening Environmental Indicators (RSEI) Model uses annual reporting from individual industrial facilities along with a variety of other information to evaluate chemical emissions and other waste management activities. RSEI incorporates detailed data from EPA's Toxics Release Inventory (TRI) and Integrated Risk Information System, the U.S. Census, and many other sources. Due to a two year TRI data lag, performance data will be unavailable for the FY 2006 Annual Performance Report. The data are based on calendar year.

**Data Source:** The RSEI model incorporates data on chemical emissions and transfers and facility locations from EPA's Toxics Release Inventory; chemical toxicity data from EPA's Integrated Risk Information System; stack data from EPA's AIRS Facility Subsystem and National Emissions Trends Database and the Electric Power Research Institute; meteorological data from the National Climatic Data Center; stream reach data from EPA's Reach File 1 Database; data on drinking water systems from EPA's Safe Drinking Water Information System; fishing activity data from U.S. Fish and Wildlife; exposure factors from EPA's Exposure Factor Handbook; and population data from the U.S. Census Bureau.

**Methods, Assumptions and Suitability:** The RSEI Model generates unique numerical values known as "Indicator Elements" using the factors pertaining to surrogate dose, toxicity and exposed population. Indicator Elements are unitless (like an index number, they can be compared to one-another but do not reflect *actual* risk), but proportional to the modeled relative risk of each release (incrementally higher numbers reflect greater estimated risk). Indicator Elements are risk-related measures generated for every possible combination of reporting facility, chemical, release medium, and exposure pathway (inhalation or ingestion). Each Indicator Element represents a unique release-exposure event and together these form the building blocks to describe exposure scenarios of interest. These Indicator Elements are summed in various ways to represent the risk-related results for releases users are interested in assessing. RSEI results are for comparative purposes and only meaningful when compared to other scores produced by RSEI. The measure is appropriate for year-to-year comparisons of performance. Depending on how the user wishes to aggregate, RSEI can address trends nationally, regionally, by state or smaller geographic areas.

**QA/QC Procedures:** TRI facilities self-report release data and occasionally make errors. TRI has QC functions and an error-correction mechanism for reporting such mistakes. EPA updates off-site facility locations on an annual basis using geocoding techniques.

**Data Quality Reviews:** RSEI depends upon a broad array of data resources, each of which has gone through a quality review process tailored to the specific data and managed by the providers of the data sources. RSEI includes data from the Toxics Release Inventory (TRI), Integrated Risk Information System (IRIS), U.S. Census, etc. All were collected for regulatory or programmatic purposes and are of sufficient quality to be used by EPA, other Federal agencies, and state regulatory agencies. Over the course of its development, RSEI has been the subject of three reviews by EPA's Science Advisory Board. The RSEI model has undergone continuous upgrading since the 1997 SAB Review. Toxicity weighting methodology was completely revised and subject to a second positive review by SAB (in collaboration with EPA's Civil Rights program); air methodology was revised and ground-truthed using New York data to demonstrate high confidence; water methodology has been revised in collaboration with EPA's Water program. When the land methodology has been reviewed and revised, EPA will have completed its formal, written response to the 1997 SAB Review.

**Data Limitations:** RSEI relies on data from a variety of EPA and other sources. TRI data may have errors that are not corrected in the standard TRI QC process. In the past, RSEI has identified some of these errors and corrections have been made by reporting companies. Drinking water intake locations are not available for all intakes nationwide. In coastal areas, Publicly Owned Treatment Works (POTW) water releases may go directly to the ocean, rather than nearby streams. EPA is in the process of systematically correcting potential errors regarding POTW water releases. These examples are illustrative of the data quality checks and methodological improvements that are part of the RSEI development effort. RSEI values are recalculated on an annual basis, and, resources permitting, all data sources are updated annually.

**Error Estimate:** In developing the RSEI methodology, both sensitivity analyses and ground-truthing studies have been used to address model accuracy ([www.epa.gov/opptintr/rsei/](http://www.epa.gov/opptintr/rsei/) (last accessed 7/28/06)). For example, ground-truthing of the air modeling performed by RSEI compared to site-specific regulatory modeling done by the state of New York showed virtually identical results in both rank order and magnitude. However, the complexity of modeling performed in RSEI, coupled with un-quantified data limitations, limits a precise estimation of errors that may either over- or under-estimate risk-related results.

**New/Improved Data or Systems:** The program regularly tracks improvements in other Agency databases (e.g., SDWIS and Reach File databases) and incorporates newer data into the RSEI databases. Such improvements can also lead to methodological modifications in the model. Corrections in TRI reporting data for all previous years are captured by the annual updates of the RSEI model.

**References:** The methodologies used in RSEI were first documented for the 1997 review by the EPA Science Advisory Board. The Agency has provided this and other updated technical documentation on the RSEI Home Page.; U.S. EPA Office of Pollution Prevention and Toxics, Risk Screening Environmental Indicators Model (RSEI) Home Page. Accessed July 24, 2006. Internet: <http://www.epa.gov/opptintr/rsei/>; U.S. EPA Office of Pollution Prevention and Toxics, Risk Screening Environmental Indicators Model, Peer Reviews. Accessed July 24, 2006. Internet: <http://www.epa.gov/oppt/rsei/pubs/faqs.html>; U.S. EPA Office of Pollution Prevention and Toxics, RSEI Methodology Document. Accessed July 24, 2006. Internet:

<http://www.epa.gov/opptintr/rsei/pubs/method2004.pdf>; U.S. EPA Office of Pollution Prevention and Toxics, RSEI User's Manual. Accessed July 24, 2006. Internet:  
[http://www.epa.gov/opptintr/rsei/pubs/users\\_manual.pdf](http://www.epa.gov/opptintr/rsei/pubs/users_manual.pdf); U.S. EPA Office of Pollution Prevention and Toxics, RSEI Fact Sheet, Accessed July 24, 2006. Internet:  
[http://www.epa.gov/opptintr/rsei/pubs/factsheet\\_v2-1.pdf](http://www.epa.gov/opptintr/rsei/pubs/factsheet_v2-1.pdf).

**FY 2006 Performance Measure: Percentage of Agricultural Acres Treated with Reduced Risk Pesticides. (PART measure)**

**Performance Database:** EPA uses an external database, Doane Marketing Research data, for this measure. The data have been reported for trend data since FY 2001 on an FY basis.

**Data Source:** Primary source is Doane Marketing Research, Inc. (a private sector research database). The database contains pesticide usage information by pesticide, year, crop use, acreage and sector.

**Methods, Assumptions and Suitability:** A reduced-risk pesticide must meet the criteria set forth in Pesticide Registration Notice 97-3, September 4, 1997. Reduced-risk pesticides include those which reduce the risks to human health; reduce the risks to non-target organisms; reduce the potential for contamination of groundwater, surface water, or other valued environmental resources; and/or broaden the adoption of integrated pest management strategies or make such strategies more available or more effective. In addition, biopesticides are generally considered safer (and thus reduced-risk). EPA's statistical and economics staff review data from Doane. Information is also compared to prior years for variations and trends as well as to determine the reasons for the variability.

Doane sampling plans and QA/QC procedures are available to the public at their website. More specific information about the data is proprietary and a subscription fee is required. Data are weighted and a multiple regression procedure is used to adjust for known disproportionalities (known disproportionality refers to a non proportional sample, which means individual respondents have different weights) and ensure consistency with USDA and state acreage estimates.

**QA/QC Procedures:** All registration actions must employ sound science and meet the Food Quality Protection Act (FQPA) new safety standard. All risk assessments are subject to public and scientific peer review. Doane data are subject to extensive QA/QC procedures, documented at their websites. In ensuring the quality of the data, EPA's pesticide program adheres to its Quality Management Plan (QMP), approved May 2000.

The main customers for Doane pesticide usage data are the pesticide registrants. Since those registrants know about sales of their own products, they have an easy way to judge the quality of Doane provided data. If they considered the quality of the data to be poor, they would not continue to purchase the data.

**Data Quality Review:** Doane data are subject to extensive internal quality review, documented at the website. EPA's statistical and economics staff review data from Doane. Information is also compared to prior years for variations and trends as well as to determine the reasons for the variability. For some crops and states, comparisons are also made with a more limited pesticide usage database from the National Agricultural Statistics of USDA.

**Data Limitations:** Doane data are proprietary; thus in order to release any detailed information, the Agency must obtain approval. There is a data lag of approximately 12-18 months, due to the collection of data on a calendar year (CY) basis, time required for Doane to process data, lead time for EPA to purchase and obtain data, plus the time it takes to review and analyze the data within the office's workload.

**Error Estimate:** Error estimates differ according to the data/database and year of sampling. This measure is compiled by aggregating information for many crops and pesticides. While considerable uncertainty may exist for a single pesticide on a single crop, pesticide use data at such a highly aggregated level are considered quite accurate. Doane sampling plans and QA/QC procedures are available to the public at their website. More specific information about the data is proprietary and a subscription fee is required. Data are weighted and multiple regression procedure is used to adjust for known disproportionalities and ensure consistency with USDA and state acreage estimates.

**New/Improved Data or Systems:** These are not EPA databases; thus improvements are not known in any detail at this time.

**References:** EPA Website; EPA Annual Report; Annual Performance Plan and Annual Performance Report, <http://www.ams.usda.gov/science/pdp/download.htm>; Doane Marketing Research, Inc.: <http://www.doanemr.com>; <http://www.usda.gov/nass/pubs> and <http://www.usda.nass/nass/nassinfo>; FFDCa Sec 408(a)(2); EPA Pesticide Registration Notice 97-3, September 4, 1997; Endangered Species Act.

**FY 2006 Performance Measure: Safe disposal of large capacitors and transformers containing polychlorinated biphenyls (PCBs).**

**Performance Database:** PCB Annual Report Database. The results are calculated on a calendar year (CY) basis. There is a two-year data lag; results for CY 06 will not be available until 2008.

**Data Source:** Annual Reports from commercial storers and disposers of PCB Waste.

**Methods, Assumptions, and Suitability:** Data provide a baseline for the amount of safe disposal of PCB waste annually. By ensuring safe disposal of PCBs in equipment such as transformers and capacitors coming out of service, and contaminated media such as soil, and structures from remediation activities, the Agency is reducing the exposure risk of PCBs that are either already in the environment or may be released to the environment through spills or leaks.

**QA/QC Procedures:** The Agency reviews, transcribes, and assembles data into the Annual Report Database.

**Data Quality Reviews:** The Agency contacts data reporters, when needed, for clarification of data submitted.

**Data Limitations:** Data limitations include missing submissions from commercial storers and disposers, and inaccurate submissions. PCB-Contaminated Transformers, of PCB concentrations 50 to 499 parts per million (ppm), and those that are 500 ppm PCBs or greater are not distinguished in the data. Similarly, large and small capacitors of PCB waste may not be differentiated. Data are collected for the previous calendar year on July 1 of the next year

creating a lag of approximately one year. Despite these limitations, the data do provide the only estimate of the amount of PCB waste disposed annually.

**References:** U.S EPA, Office of Pollution Prevention and Toxics, National Program Chemicals Program, PCB Annual Report for Storage and Disposal of PCB Waste.

**FY 2006 Performance Measure: Annual percentage of lead-based paint certification and refund applications that require less than 40 days of EPA effort to process. (PART efficiency measure)**

**Performance Database:** The National Program Chemicals Division (NPCD) in the Office of Pollution Prevention and Toxics (OPPT) maintains the Federal Lead-Based Paint Program (FLPP) database, an electronic database of applications for certification by individuals and firms and applications for accreditation by training providers in states and tribal lands administered by a Federal lead program. The database provides a record of all applications for certification or accreditation for Federally-managed lead programs and the actions on those applications. The database is augmented by hard copy records of the original applications.

**Data Source:** The FLPP database is available internally to EPA Headquarters and Regional lead program staff who process the applications or oversee the processing. The database is maintained on an EPA Research Triangle Park (RTP), North Carolina server. Access to the database is granted by the Lead, Heavy Metals, and Inorganics Branch (LHMIB) in NPCD. Overall maintenance of the database and periodic improvements are handled by a contractor, currently ICF Consulting, located in Fairfax, Virginia. Data entry of application data is conducted by a second contractor, currently Optimus Corporation, located in Silver Spring, Maryland. Optimus Corporation maintains the file of the original applications. Each EPA Regional office maintains a file of copies of the original applications for that region.

**Methods, Assumptions and Suitability:** The number of applications for certification in Federally-managed states and tribal lands is approximately 3000 per year. Each of these applications is processed. Certification is issued if all criteria are met. Some applications may be returned to the applicant or withdrawn by the applicant. For the applications that are fully processed, the length of time for EPA processing can be determined from date fields in the FLPP database. Accordingly, a census of all the fully processed applications for certification can be conducted, and the percentage of applications that took more than the prescribed number of days (e.g., 40) of EPA effort to process can be computed based on this census. The census is conducted every six months, and the annual percentage calculated appropriately from the six month percentages.

**QA/QC Procedures:** NPCD has an approved Quality Management Plan in place, dated January 2005. Applications and instructions for applying for certification and accreditation are documented and available at the web site (last accessed 7/26/06) <http://www.epa.gov/lead/pubs/traincert.htm>. Documentation for the FLPP database is maintained internally at EPA and is available upon request.

**Data Quality Reviews:** The FLPP database is an internal EPA database, maintained for the purpose of processing and tracking applications. The database is interactive, and operational usage in processing applications by Headquarters and the Regional offices provides ongoing quality reviews.

**Data Limitations:** Applications that were returned to the applicant or withdrawn by the applicant are out of scope for this performance measure.

**Error Estimate:** There is no sampling error in this performance measure, because it is based on a census of all applicable records.

**New/Improved Data or Systems:** The FLPP database is scheduled to undergo improvements in the next few years. The performance measurement system will help determine if there is a change in timeliness after the improvements are implemented.

**References:** 1) Quality Management Plan for National Program Chemicals Division, January 2005; 2) FLPP database documentation; 3) URL for Applications and Instructions, (last accessed 7/26/06) <http://www.epa.gov/lead/pubs/traincert.htm>.

**FY 2006 Performance Measures:**

- **Number of cases of children aged 1-5 years with elevated blood lead levels (> or = 10 ug/dL). *This performance measure is a direct measure of Healthy People 2010 goal 8-11.* (PART measure)**
- **Percentage difference in the geometric mean blood level in low-income children 1-5 years old as compared to the geometric mean for non-low income children 1-5 years old. (PART measure)**

**Performance Database:** Data from the Centers for Disease Control and Prevention's (CDC) National Health and Nutrition Examination Survey (NHANES) is recognized as the primary database in the United States for national blood lead statistics. NHANES is a probability sample of the non-institutionalized population of the United States. Data are collected on a calendar year basis, and is currently released to the public in two year sets. The most current release is the data set for 2003-2004, released in June 2006. Blood lead levels are measured for participants who are at least one year old. The survey collects information on the age of the participant at the time of the survey.

**Data Source:** The National Health and Nutrition Examination Survey is a survey designed to assess the health and nutritional status of adults and children in the U.S. The survey program began in the early 1960s as a periodic study, and continues as an annual survey. The survey examines a nationally representative sample of approximately 5,000 men, women, and children each year located across the U.S. CDC's National Center for Health Statistics (NCHS) is responsible for the conduct of the survey and the release of the data to the public. NCHS and other CDC centers publish results from the survey, generally in CDC's Morbidity and Mortality Weekly Report (MMWR), but also in scientific journals. In recent years, CDC has published a National Exposure report based on the data from the NHANES. The most current National Exposure report was released June 2006, and is available at the web site <http://www.cdc.gov/exposurereport/> (last accessed 7/26/06). The next National Exposure report is expected in mid 2007.

**Methods, Assumptions, and Suitability:** Detailed interview questions cover areas related to demographic, socio-economic, dietary, and health-related questions. The survey also includes an extensive medical and dental examination of participants, physiological measurements, and laboratory tests. Specific laboratory measurements of environmental interest include: metals (e.g. lead, cadmium, and mercury), VOCs, phthalates, organophosphates (OPs), pesticides and their metabolites, dioxins/furans, and polyaromatic hydrocarbons (PAHs). NHANES is unique in that it links laboratory-derived biological markers (e.g. blood, urine etc.) to questionnaire

responses and results of physical exams. For this performance measure, NHANES has been recognized as the definitive source. Estimates of the number of children 1-5 years with an elevated blood lead level based on NHANES have been published by CDC, most recently in May 2005. (See <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5420a5.htm>) (Last accessed 7/26/06). Analytical guidelines issued by NCHS provide guidance on how many years of data should be combined for an analysis.

**QA/QC Procedures:** Background documentation is available at the NHANES web site at <http://www.cdc.gov/nchs/nhanes.htm> (Last accessed 7/26/06). The analytical guidelines are available at the web site (last accessed 7/26/06) [http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical\\_guidelines.htm](http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm).

**Data Quality Reviews:** CDC follows standardized survey instrument procedures to collect data to promote data quality, and data are subjected to rigorous QA/QC review. Additional information on the interview and examination process can be found at the NHANES web site at (last accessed 7/26/06) <http://www.cdc.gov/nchs/nhanes.htm>.

**Data Limitations:** NHANES is a voluntary survey and selected persons may refuse to participate. In addition, the NHANES survey uses two steps, a questionnaire and a physical exam. There are sometimes different numbers of subjects in the interview and examinations because some participants only complete one step of the survey. Participants may answer the questionnaire but not provide the more invasive blood sample. Special weighting techniques are used to adjust for non-response. Seasonal changes in blood lead levels cannot be assessed under the current NHANES design. Because NHANES is a sample survey, there may be no children with elevated blood lead levels in the sample, but still some children with elevated blood lead levels in the population.

**Error Estimate:** Because NHANES is based on a complex multi-stage sample design, appropriate sampling weights should be used in analyses to produce estimates and associated measures of variation. Recommended methodologies and appropriate approaches are addressed in the analytical guidelines provided at the NHANES web site (last accessed 7/26/06) [http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical\\_guidelines.htm](http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm).

**New/Improved Data or Systems:** NHANES has moved to a continuous sampling schedule, scheduled release of data, and scheduled release of National Exposure reports by CDC.

**References:** (1) the NHANES web site, <http://www.cdc.gov/nchs/nhanes.htm>; (2) the National Exposure report web site, <http://www.cdc.gov/exposurereport/>; (3) MMWR article with the most recent estimate of the number of children with elevated blood lead levels, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5420a5.htm>; (4) NHANES Analytical Guidelines, [http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical\\_guidelines.htm](http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm).

**FY 2006 Performance Measure:** Percentage of TRI chemical forms submitted over the Internet using the Toxic Release Inventory Made Easy (TRI-ME) and the Central Data Exchange (CDX).

**Performance Database:** TRI System (TRIS).

**Data Source:** Facility submissions of TRI data to EPA.

**Methods, Assumptions, and Suitability:** As part of the regular process of opening the mail at the TRI Reporting Center, submissions are immediately classified as paper or floppy disk. This information is then entered into TRIS. The identification of an electronic submission via CDX is done automatically by the software.

**QA/QC Procedures:** Currently, the mail room determines whether a submission is on paper or a floppy disk during the normal process of entering and tracking submissions. Electronic submissions via CDX are automatically tracked by the software. With an increase in electronic reporting via CDX, the manual mail room processing will be significantly reduced. Information received via hard copy are double-key entered. During the facility reconciliation process, the data entered are checked to ensure “submission-type” identification is accomplished at no less than 99 percent accuracy. Accuracy is defined as accurate identification of document type.

**Data Quality Reviews:** Each month the Data Processing Center conducts data quality checks to ensure 99 percent accuracy of submission information captured in TRIS.

**Data Limitations:** Occasionally, some facilities send in their forms in duplicative formats (e.g., paper, floppy, and/or through CDX). All submissions are entered into TRIS. The Data Processing Center follows the procedures outlined in the document "*Dupe Check Procedures*" to identify potential duplicate submissions. Submissions through CDX override duplicate submissions by disk and/or hard copy. Floppy disk submissions override duplicate paper copy submissions.

**Error Estimate:** The error rate for “submission-type” data capture has been assessed to be less than 1 percent. The quality of the data is high.

**New/Improved Performance Data or Systems:** EPA continues to identify enhancements in E-reporting capabilities via CDX.

**References:** [www.epa.gov/TRI](http://www.epa.gov/TRI)

**FY 2006 Performance Measure: Number of risk management plan audits completed.**

**Performance Database:** There is no database for this measure.

**Data Source:** OSWER's Office of Emergency Management implements the Risk Management Program under Clean Air Act section 112(r). Facilities are required to prepare Risk Management Plans (RMPs) and submit them to EPA. In turn, HQ provides appropriate data to each Region and delegated State so that they have the RMP data for their geographical area. The Regions and delegated States conduct audits. About ten States have received delegation to operate the RMP program. These delegated States report audit numbers to the appropriate EPA Regional office so it can maintain composite information on RMP audits.

**Methods, Assumptions and Suitability:** Data are collected and analyzed by surveying EPA's Regional offices to determine how many audits of facilities' risk management plans (RMPs) have been completed.

**QA/QC Procedures:** Data are collected from states by EPA's Regional offices, with review at the Regional and Headquarters' levels.

**Data Quality Review:** Data quality is evaluated by both Regional and Headquarters' personnel.

**Data Limitations:** Data quality is dependent on completeness and accuracy of the data provided by state programs.

**FY 2006 Performance Measure: Emission inventory for power sectors in China and India.**

**Performance Database:** Output measure. No database. Mercury emission and use data will be collected at targeted sites.

**Data Source:** EPA's Office of International Activities (OIA) and the Office of Research and Development (ORD) will collaborate with Chinese scientists and Indian government officials to collect mercury use and emission data.

**QA/QC Procedures:** Procedures for field and laboratory, including protocols for internal quality control checks and acceptance criteria will follow the Department of Energy's (DOE) and EPA's National Exposure Research Laboratory's (NERL- Research Triangle Park (RTP)) methodologies.

**GOAL 4 OBJECTIVE 2**

**FY 2006 Performance Measure: Border communities monitoring for a pollutant that has not previously been monitored in that community.**

**Performance Database:** The measure will allow EPA to "count" improvements within an existing monitored area -- for example, installation of CO monitors in a community that did not previously monitor for CO, even if that community already monitors for other pollutants. This is an important change from the previous measure, which only allowed us to "count" a monitoring activity if it occurred in a completely new location. An internal database will be set up to track the measure.

Information on air releases will be contained in the Aerometric Information Retrieval System (AIRS), a computer-based repository for information about air pollution in the United States.

**Data Source:** The information on installation of new monitors would come from the local and/or regional environmental authorities. The data collected by the monitors will be quality assured/quality controlled and stored in AIRS.

**QA/QC Procedures:** The QA Handbook for Ambient Air Pollution Measurement Systems will serve as guidance for the implementation and management of any Ambient Air Quality Monitoring Network. The document provides organizations with pertinent information and guidance in sampling, and analyzing ambient air monitoring data and reporting the information to the AIRS network. To ensure transparency and foster information exchange, the coordinating bodies disseminate information regarding their activities and progress on specific projects by posting information to Web sites and list servers, through print media and public meetings, as well as by participating in environmental fairs and environmental education programs.  
<http://www.epa.gov/usmexicoborder/reports.htm>.

**References:** EPA's OAQPS: <http://www.epa.gov/oar/oaqps/qa/index.html#handbook>  
Air Data Systems: <http://epa.gov/compliance/planning/data/air/>

Envirofacts: <http://www.epa.gov/enviro/html/air.html>

**FY 2006 Performance Measure:** Number of people in Mexico border area protected from health risks because of adequate water and wastewater sanitation systems funded through border environmental infrastructure funding (cumulative).

**Performance Database:** No formal EPA database. Performance is tracked and reported quarterly by the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank). Data fields are population served by and homes connected to potable water and wastewater collection and treatment systems.

**Data Source:** Data sources include U.S. population figures from the 2000 U.S. Census, data on U.S. and Mexican populations served and homes connected by "certified" water/wastewater treatment improvements from the BECC and data on projects funded from the NADBank.

**Methods, Assumptions and Suitability:** Summation of population from BECC and NADBank.

**QA/QC Procedures:** EPA Headquarters is responsible for evaluation of reports from BECC and NADBank on drinking water and wastewater sanitation projects. Regional representatives attend meetings of the certifying and financing entities for border projects (BECC and NADBank) and conduct site visits of projects underway to ensure the accuracy of information reported.

**Data Quality Reviews:** Regional representatives attend meetings of the certifying and financing entities for border projects (BECC and NADBank) and conduct site visits of projects underway to ensure the accuracy of information reported.

**Error Estimate:** The error estimate is the same rate accepted by the U.S. Census.

**References:** U.S. Department of Commerce, Bureau of the Census, (Washington, DC: U.S. Department of Commerce, 1990). *Instituto Nacional de Estadística, Geografía y Informática, Aguascalientes*, Total Population by State (1990).

Border Environment Cooperation Commission (BECC), Cd Juarez, Chih, and North American Development Bank (NADBank), (San Antonio, TX, 2002).

**FY 2006 Performance Measures:**

- Number of Brownfields properties assessed. (PART performance)
- Number of Brownfields cleanup grants awarded.
- Number of properties cleaned up using Brownfields funding.
- Number of acres of Brownfields property available for reuse. (PART performance)
- Number of jobs leveraged from Brownfields activities.
- Percentage of Brownfields job training trainees placed.
- Billions of dollars of cleanup and redevelopment funds leveraged at Brownfields sites.

**Performance Database:** The Assessment Cleanup and Redevelopment Exchange System (ACRES) tracks the performance information for the above measures.

Key fields related to performance measures include, but are not limited to:

Property Acreage, Assessment Completion Date, Cleanup Required, Cleanup Completion Date, Funding Leveraged, Jobs Leveraged, Number of Participants Completing Training, and Number of Participants Obtaining Employment.

Performance measure data is tracked by fiscal year and will not be available for the FY 08 PAR; data will be available for the FY 09 PAR.

**Data Source:** Data are extracted from quarterly reports and property profile forms (<http://www.epa.gov/brownfields/pubs/rptforms.htm>) prepared by assessment, cleanup, revolving loan fund (RLF), job training, and State and Tribal 128 Voluntary Response Program cooperative agreement award recipients. Information on Targeted Brownfields Assessments is collected from EPA Regions.

**Methods, Assumptions and Sustainability:** Cooperative agreement recipients report performance data in quarterly reports and property profile forms. Data are reviewed by Regional EPA grant managers to verify activities and accomplishments. Given the reporting cycle and the data entry/QA period, there is typically a six month data lag for ACRES data.

Note that accomplishments reported by Brownfields Assessment Grantees, Brownfields Cleanup Grantees, Brownfields Revolving Loan Fund Grantees, Brownfields Job Training Grantees, Regional Targeted Brownfields Assessments, and State and Tribal 128 Voluntary Response Program Grantees all contribute towards these performance measures. "Number of Brownfields properties assessed" is an aggregate of assessments completed with Assessment Grant funding, Regional Targeted Brownfields Assessment funding, and State and Tribal 128 Voluntary Response Program funding. "Number of Brownfields properties cleaned up" is an aggregate of properties cleaned up by RLF Grantees, Cleanup Grantees, and State and Tribal 128 Voluntary Response Program Grantees. "Number of Acres Made Ready for Reuse" is an aggregate of acreage assessed that does not require cleanup and acreage cleaned up as reported by Assessment Grantees, Regional Targeted Brownfields Assessments, Cleanup Grantees, RLF Grantees, and State and Tribal 128 Voluntary Response Program Grantees. "Number of cleanup and redevelopment jobs leveraged" is the aggregate of jobs leveraged by Assessment, Cleanup and RLF Grantees. "Amount of cleanup and redevelopment funds leveraged at Brownfields properties" is the aggregate of funds leveraged by Assessment, Cleanup and RLF Grantees. "Percentage of Brownfields job training trainees placed" is based on the "Number of Participants Completing Training" and the "Number of Participants Obtaining Employment" reported by Job Training Grantees.

**QA/QC Procedures:** Data reported by cooperative award agreement recipients are reviewed by EPA Regional grant managers for accuracy and to ensure appropriate interpretation of performance measure definitions. Reports are produced monthly with detailed data trends analysis.

**Data Limitations:** All data provided voluntarily by grantees.

**New/Improved Data or Systems:** The Brownfields Program updated the Property Profile Form in FY 2006 to improve data collection and to expand the community of grantees completing the form. The Program anticipates launching an online reporting form in FY 2007; this system will be phased in over the next several years.

**References:** For more information on the Brownfields program, see *Reusing Land and*

*Restoring Hope: A Report to Stakeholders from the US EPA Brownfields Program* ([http://www.epa.gov/brownfields/news/stake\\_report.htm](http://www.epa.gov/brownfields/news/stake_report.htm)); assessment demonstration pilots and grants ([http://www.epa.gov/brownfields/assessment\\_grants.htm](http://www.epa.gov/brownfields/assessment_grants.htm)); cleanup and revolving loan fund pilots and grants (<http://www.epa.gov/brownfields/rflfst.htm>); job training pilots and grants (<http://www.epa.gov/brownfields/job.htm>); and cleanup grants ([http://www.epa.gov/brownfields/cleanup\\_grants.htm](http://www.epa.gov/brownfields/cleanup_grants.htm)).

**FY 2006 Performance Measures:**

- **Number of environmental reviews initiated by FTAA countries following the enactment of the 2002 Trade Promotion Act (TPA)**
- **Latin American countries initiating environmental assessments of trade liberalization**

**Data Source:** Project / Trade Agreement Specific

**QA/QC Procedures:** Verification does not involve any pollutant database analysis, but will require objective assessment of: (1) tasks completed, (2) compliance with new regulation, and (3) progress toward project goals and objectives.

Validating measurements under international programs presents several challenges. Technical assistance projects, for instance, typically target developing countries, which often do not have sound data collection and analysis systems in place. Non-technical projects, such as assistance in regulatory reform, frequently must rely on more subjective measures of change, such as the opinions of project staff or reviews by third-party organizations, including other U.S. government organizations, of the long-term efficacy of the assistance provided.

EPA works with its trading partners on capacity building projects, which establish the framework and tools to help partnering countries minimize the potential to degrade the environment and harm human health. Projects will help prevent pollution at the source, will be tailored to partner-country needs and be built on past US assistance.

Tracking development and implementation of these projects presents few challenges because EPA project staff maintain close contact with their counterparts and any changes become part of a public record.

Assessing the effectiveness of these projects or the environmental provisions in trade agreements is more subjective. Aside from feedback from Agency project staff, EPA relies, in part, on feedback from its trading partners in the target countries and regions and from non-governmental organizations (NGOs) and other third parties. Because EPA works to establish long-term relationships with its trading partners, the Agency is often able to assess environmental improvements in these countries and regions for a number of years following implementation of the trade agreement.

**GOAL 4 OBJECTIVE 3**

**FY 2006 Performance Measures:**

- **Prevent water pollution and improve the overall aquatic ecosystem health of coastal waters of the Gulf of Mexico by .2 on the “good/fair/poor” scale of the National Coastal Condition Report.**
- **Reduce releases of nutrients throughout the Mississippi River Basin to reduce the size of the hypoxic zone in the Gulf of Mexico.**

**Performance Database:** (1) Louisiana Coastal Hypoxia Shelfwide Survey metadata (data housed at National Oceanic and Atmospheric Administration/National Ocean Data Center, Silver Spring, Maryland). Funds for this research are provided by the National Oceanic and Atmospheric Administration, Coastal Ocean Program (NOAA/COP); (2) Southeast Area Monitoring and Assessment Program (**SEAMAP**) - Gulf surveys.

The data used in assessing performance under this measure have been collected annually on a calendar year basis since 1982.

**Data Source:** (1) Hydrographic data are collected during annual surveys of the Louisiana continental shelf. Nutrient, pigment and station information data are also acquired. The physical, biological and chemical data collected are part of a long-term coastal Louisiana dataset. The goal is to understand physical and biological processes that contribute to the causes of hypoxia and use the data to support environmental models for use by resource managers. (2) The Southeast Area Monitoring and Assessment Program (SEAMAP) is a state/Federal/university program for collection, management and dissemination of fishery-independent data and information in the southeastern United States.

**Methods, Assumptions and Suitability:** The distribution of hypoxia on the Louisiana shelf has been mapped annually in mid-summer (usually late July to early August) over a standard 60- to 80- station grid since 1985. During the shelfwide cruise, data are collected along transects from the mouth of the Mississippi River to the Texas border. Information is collected on a wide range of parameters, including conductivity/temperature/depth (CTD), light penetration, dissolved oxygen, suspended solids, nutrients, phytoplankton, and chlorophyll. Hydrographic, chemical, and biological data also are collected from two transects of Terrebonne Bay on a monthly basis, and bimonthly, off Atchafalaya Bay. There is a single moored instrument array in 20-m water depth in the core of the hypoxic zone that collects vertical conductivity/temperature data, as well as near-surface, mid, and near-bottom oxygen data; an upward directed Acoustic Doppler Current Profiler (ADCP) on the seabed measures direction and speed of currents from the seabed to the surface. There is also an assortment of nutrient and light meters.

Station depths on the cruises range from 3.25 to 52.4 meters. Northern end stations of transects are chosen based on the survey vessel's minimum depth limits for each longitude.

Standard data collections include hydrographic profiles for temperature, salinity, dissolved oxygen, and optical properties. Water samples for chlorophyll *a* and phaeopigments, nutrients, salinity, suspended sediment, and phytoplankton community composition are collected from the surface, near-bottom, and variable middle depths.

The objective is to delimit and describe the area of midsummer bottom dissolved oxygen less than 2 (mg. L).

Details of data collection and methodology are provided in referenced reports.

**QA/QC Procedures:** NOAA does not require written QA/QC procedures or a Quality Management Plan; however, the procedures related to data collection are covered in metadata files.

The SEAMAP Data Management System (DMS) conforms to the SEAMAP Gulf and South Atlantic DMS Requirements Document developed through a cooperative effort between National Marine Fisheries Service (NMFS) and other SEAMAP participants.

**Data Quality Reviews:** (1) Essential components of the environmental monitoring program in the Gulf of Mexico include efforts to document the temporal and spatial extent of shelf hypoxia, and to collect basic hydrographic, chemical and biological data related to the development of hypoxia over seasonal cycles. All data collection protocols and data are presented to and reviewed by the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force (the Task Force) in support of the adaptive management approach as outlined in the Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico (the Action Plan).

(2) Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed in conjunction with National Marine Fisheries Service – Southeast Fisheries Science Center (NMFS-SEFSC). Raw data are edited by the collecting agency and verified by the SEAMAP Data Manager prior to entry into the system. Data from all SEAMAP-Gulf surveys during 1982-2003 have been entered into the system, and data from 2004 surveys are in the process of being verified, edited, and entered for storage and retrieval.

**Data Limitations:** Monitoring for shelf-wide conditions are currently performed each year primarily, but not exclusively, in July. The spatial boundaries of some monitoring efforts are limited by resource availability. Experience with the datasets has shown that when data are plotted or used in further analysis, outlying values may occasionally be discovered.

**Error Estimate:** (1) The manufacturers state +/- 0.2mg/L as the error allowance for both SeaBird and Hydrolab oxygen sensors.

**References:** Mississippi River/Gulf of Mexico Watershed Nutrient Task force.2001. Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico. Washington, DC.; Rabalais N.N., R.E. Turner, Dubravko Justic, Quay Dortch, and W.J. Wiseman. 1999. Characterization of Hypoxia. Topic 1 Report for the Integrated assessment on Hypoxia in the Gulf of Mexico. NOAA Coastal Ocean Program Decision Analysis Series No. 15. Silver Spring Maryland: National Oceanic and Atmospheric Administration.; Hendee, J.C. 1994. Data management for the nutrient enhanced coastal ocean productivity program. *Estuaries* 17:900-3; Rabalais, Nancy N., W.J. Wiseman Jr., R.E. Turner-Comparison of continuous records of near-bottom dissolved oxygen from the hypoxia zone of Louisiana. *Estuaries* 19:386-407; SEAMAP Information System <http://www.gsmfc.org/sis.html>.

### **FY 2006 Performance Measure: Acres of submerged aquatic vegetation (SAV) present in the Chesapeake Bay**

**Performance Database:** SAV acres in Chesapeake Bay. Total acres surveyed and estimated additional acres from 1978 through 2005, excluding the years 1979-1983 and 1988 when no surveys were conducted. The FY 2007 Annual Performance Report for this measure will be based on the results of the survey conducted the previous calendar year (2006). We expect to receive the preliminary survey results for calendar year 2006 in March 2007.

**Data Source:** Virginia Institute of Marine Sciences provides the data (via an EPA Chesapeake Bay Program (CBP) grant to Virginia Institute of Marine Sciences). EPA has confidence in the third party data and believes the data are accurate and reliable based on QA/QC procedures described below.

**Methods, Assumptions and Suitability:** The SAV survey is a general monitoring program, conducted to optimize precision and accuracy in characterizing annually the status and trends of SAV in tidal portions of the Chesapeake Bay. The general plan is to follow fixed flight routes over shallow water areas of the Bay, to comprehensively survey all tidal shallow water areas of the Bay and its tidal tributaries. Non-tidal areas are omitted from the survey. SAV beds less than 1 square meter are not included due to the limits of the photography and interpretation. Annual monitoring began in 1978 and is ongoing. Methods are described in the Quality Assurance Project Plan (QAPP) on file for the EPA grant and at the VIMS web site (<http://www.vims.edu/bio/sav/>).

**QA/QC Procedures:** Quality assurance project plan for the EPA grant to the Virginia Institute of Marine Sciences describes data collection, analysis, and management methods. This is on file at the EPA Chesapeake Bay Program Office. The VIMS web site at <http://www.vims.edu/bio/sav/> provides this information as well. Metadata are included with the data set posted at the VIMS web site (<http://www.vims.edu/bio/sav/metadata/recent.html>).

**Data Quality Reviews:** This indicator has undergone extensive technical and peer review by state, Federal and non-government organization partner members of the SAV workgroup and the Living Resources subcommittee. Data collection, data analysis and QA/QC are conducted by the principal investigators/scientists. The data are peer reviewed by scientists on the workgroup. Data selection and interpretation, the presentation of the indicator, along with all supporting information and conclusions, are arrived at via consensus by the scientists and resource manager members of the workgroup. The workgroup presents the indicator to the subcommittee where extensive peer review by Bay Program managers occurs.

There have been no data deficiencies identified in external reviews.

**Data Limitations:** There were no surveys in the years 1979-1983 and 1988. Spatial gaps in 1999 occurred due to hurricane disturbance and subsequent inability to reliably photograph SAV. Spatial gaps in 2001 occurred due to post-nine-eleven flight restrictions near Washington D.C. Spatial gaps in 2003 occurred due to adverse weather in the spring and summer and Hurricane Isabel in the fall.

**New/Improved Data or Systems:** Some technical improvements (e.g., photointerpretation tools) were made over the 22 years of the annual SAV survey in Chesapeake Bay.

**References:** See Chesapeake Bay SAV special reports at <http://www.vims.edu/bio/sav/savreports.html> and bibliography at <http://www.vims.edu/bio/sav/savchespub.html>. The SAV distribution data files are located at <http://www.vims.edu/bio/sav/savdata.html> and also at <http://www.chesapeakebay.net/pubs/statustrends/88-data-2002.xls>. The SAV indicator is published at <http://www.chesapeakebay.net/status.cfm?sid=88>.

**FY 2006 Performance Measures:**

- **Reduction, from 1985 levels, of nitrogen entering the Chesapeake Bay (cumulative).**
- **Reduction, from 1985 levels, of phosphorus entering the Chesapeake Bay (cumulative).**
- **Reduction, from 1985 levels, of sediment loads entering Chesapeake Bay (cumulative).**

**Performance Database:** Reducing Pollution Summary (Controlling Nitrogen, Phosphorus and Sediment.) Implementation of point & nonpoint source nitrogen and phosphorus reduction practices throughout the Bay watershed, expressed as % of reduction goal achieved. The nitrogen goal is a 162.5 million pound reduction from 1986 levels to achieve an annual cap load of 175 million lbs (based on long-term average hydrology simulations). The phosphorus goal is a 14.36 million pound reduction from FY1986 levels to achieve an annual cap load of 12.8 million lbs (based on long-term average hydrology simulations). Achieving the cap loads is expected to result in achievement of the long-term restoration goals for submerged aquatic vegetation and dissolved oxygen. Point source loads are monitored or estimated based on expert evaluation of treatment processes. Nonpoint source loads are simulated based on reported implementation of best management practices (BMPs) that reduce nitrogen and phosphorus pollution. The simulation removes annual hydrological variations in order to measure the effectiveness of BMP implementation and converts the numerous BMPs, with various pollution reduction efficiencies – depending on type and location in the watershed – to a common currency of nitrogen and phosphorus reduction. Implementation of sediment reduction practices throughout the Bay watershed, expressed as % of land-based sediment reduction goal achieved. The sediment reduction goal is a 1.69 million ton reduction from FY 1986 levels to achieve an annual cap load of 4.15 million tons (based on average hydrology simulations). Achieving this cap load is expected to result in achievement of the long-term restoration goals for submerged aquatic vegetation and dissolved oxygen. Loads are simulated based upon reported implementation of best management practices (BMPs) that reduce sediment pollution. The simulation removes annual hydrological variations in order to measure the effectiveness of BMP implementation and converts the numerous BMPs, with various pollution reduction efficiencies – depending on type and location in the watershed – to a common currency of sediment reduction.

The Bay data files used in the indicator are located at <http://www.chesapeakebay.net/pubs/statustrends/186-data-2003.xls>. Data have been collected in 1985, 2000, 2001, 2002, 2003, 2004, and 2005 and are expected on an annual basis after 2005. There is a one year data lag. Load data are from Chesapeake Bay watershed portions of NY, MD, PA, VA, WV, DE, and DC. The one year data lag is due to the fact that calendar year data are collected on an annual basis only. The 2006 calendar year is not completed so the only data available to meet the 2006 PAR deadlines is data from 2005.

The FY 2007 Annual Performance Report for these measures will be based on the results of the 2006 data collection. We expect to receive the preliminary results for 2006 in September 2007. The 2007 calendar year will not be available to meet the 2007 PAR deadlines so 2006 data will be provided.

**Data Source:** Each jurisdiction (NY, MD, PA, VA, WV, DE, and DC) tracks and approves annual point source effluent concentrations, flows data as well as non-point source BMP data. It submits the data to the Chesapeake Bay Program Office. Contact Jeff Sweeney, [jsweeney@chesapeakebay.net](mailto:jsweeney@chesapeakebay.net).

**Methods, Assumptions and Suitability:** The data are of high quality. Data are consolidated by watershed boundaries at the state level and provided to the Chesapeake Bay Program Office for input into the watershed model.

What is the Watershed Model? A lumped parameter Fortran based model (HSPF) that mimics the effects of hydrology, nutrient inputs, and air deposition on land and outputs runoff, groundwater, nutrients and sediment to receiving waters. Ten years of simulation are used and

averaged to develop the reduction effects of a given set of Best Management Practices (BMPs). Using a ten-year average of actual weather (hydrologic, temperature, wind, etc.) ensures wet, dry and average conditions for each season are included. The effectiveness of the model is dependent upon the quality of the assumptions, BMPs and landuse descriptions used. The model is calibrated extensively to real-time monitoring, outside peer review and continual updates as better information, data collection and computer processing power become available.

What are the input data? The model takes meteorological inputs such as precipitation, temperature, evapotranspiration, wind speed, solar radiation, dewpoint, and cloud cover to drive the hydrologic simulation. The changes in nutrient outputs are primarily determined by such factors as land use acreage, BMPs, fertilizer, manure, atmospheric deposition, point sources, and septic loads.

BMPs: Watershed Model BMPs include all nutrient reduction activities tracked by the jurisdictions for which a source has been identified, cataloged and assigned an efficiency. Efficiencies are based on literature review, recommendations of the appropriate source workgroup and approved by the Nutrient Subcommittee. It is the responsibility of the jurisdictions to track and report all nutrient reduction activities within their borders and maintain documentation to support submissions.

Land use acreage is determined by combining analyses of satellite imagery and county-based databases for agricultural activities and human population. Fertilizer is determined by estimated application rates by crops and modified by the application of nutrient management BMPs. Manure applications are determined by an analysis of animal data from the census of agriculture.

Atmospheric deposition is determined by an analysis of National Atmospheric Deposition Program (NADP) deposition data and modified by scenarios of the Regional Acid Deposition Model. Point Source loads are determined from Discharge Monitoring Reports. Septic loads are estimated in a study commissioned by the CBP.

<http://www.chesapeakebay.net/pubs/1127.pdf>, <http://www.chesapeakebay.net/pubs/114.pdf>,  
<http://www.chesapeakebay.net/pubs/112.pdf>  
<http://www.chesapeakebay.net/pubs/777.pdf>

What are the model outputs? The watershed model puts out daily flows and nitrogen, phosphorus, and sediment loads for input to the water quality model of the Chesapeake Bay. The daily loads are averaged over a 10-year hydrologic period (1985-1994) to report an average annual load to the Bay. The effect of flow is removed from the load calculations.

What are the model assumptions? BMPs: Model assumptions are based on three conditions: knowledge, data availability and computing power. The ability to alter what is used in the watershed model is a function of the impact the change would have on calibration. In many cases there is new information, data or methodologies that would improve the model, but changes are not possible because of the impact on the current calibration.

Changes in manure handling, feed additives, new BMPs and some assumptions could be incorporated into the model without impacting the calibration. In these cases, the changes were made.

Other input assumptions, such as multiple manure application levels, increasing the number and redefining some land uses, defining new nutrient or sediment sources, adjusting for varying levels of management (range of implementation levels) are items scheduled for incorporation in the new model update (2007).

Input assumptions are documented in the above publications. Assumptions of the actual model code are in the HSPF documentation:

[ftp://water.usgs.gov/pub/software/surface\\_water/hspf/doc/hspfhelp.zip](ftp://water.usgs.gov/pub/software/surface_water/hspf/doc/hspfhelp.zip)

Data are collected from states and local governments programs. Methods are described at <http://www.chesapeakebay.net/data/index.htm>, (refer to CBP Watershed Model Scenario Output Database, Phase 4.3). For more information contact Kate Hopkins at [hopkins.kate@epa.gov](mailto:hopkins.kate@epa.gov) or Jeff Sweeney [jsweeney@chesapeakebay.net](mailto:jsweeney@chesapeakebay.net)

**QA/QC Procedures:** State offices have documentation of the design, construction and maintenance of the databases used for the performance measures, showing they conform to existing U.S. Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) technical standards and specifications for nonpoint source data and EPA's Permit Compliance System (PCS) standards for point source data. State offices also have documentation of implemented Best Management Practices (BMPs) based on USDA NRCS standards and specification and the Chesapeake Bay Program's protocols and guidance. BMPs are traditionally used to reduce pollutant loads coming from nonpoint sources such as urban/suburban runoff, agriculture, and forestry activities.

References include: the USDA NRCS Technical Guide and Appendix H from the Chesapeake Bay Program (contact Russ Mader at [mader.russ@epa.gov](mailto:mader.russ@epa.gov) or Kate Hopkins at [hopkins.kate@epa.gov](mailto:hopkins.kate@epa.gov)). Quality assurance program plans are available in each state office.

**Data Quality Reviews:** All data are reviewed and approved by the individual jurisdictions (NY, MD, PA, VA, WV, DE, and DC) before input to the watershed model. QA/QC is also performed on the input data to ensure basic criteria, such as not applying a BMP at a higher level than allowed. A specific level of input should yield output within a specified range of values. Output is reviewed by both the CBPO staff and the Tributary Strategy Workgroup as an additional level of QA/QC. Any values out of the expected range is analyzed and understood before approval and public release. The model itself is given a quarterly peer review by an outside independent group of experts. There have been no data deficiencies identified in external reviews.

**Data Limitations:** Data collected from voluntary collection programs are not included in the database, even though they may be valid and reliable. The only data submitted by state and local governments to the Chesapeake Bay Program Office are data that are required for reporting under the cost share and regulatory programs. Cost share programs include state and federal grant programs that require a recipient match. State and local governments are aware that additional data collection efforts are being conducted by non-governmental organizations, however, they are done independently of the cost share programs and are not reported.

**Error Estimate:** There may be errors of omission, misclassification, incorrect georeferencing, misdocumentation or mistakes in the processing of data.

**New/Improved Data or Systems:** The next version of the watershed model is currently under development and will be completed in 2006. The new version (phase 5) will have increased spatial resolution and ability to model the effects of management practices. The phase 5

watershed model is a joint project with cooperating state and Federal agencies. Contact Gary Shenk [gshenk@chesapeakebay.net](mailto:gshenk@chesapeakebay.net) or see the web site at <http://www.chesapeakebay.net/phase5.htm>.

**References:** See <http://www.chesapeakebay.net/data/index.htm>, refer to CBP Watershed Model Scenario Output Database, Phase 4.3. Contact Kate Hopkins at [hopkins.kate@epa.gov](mailto:hopkins.kate@epa.gov) or Jeff Sweeney [jsweeney@chesapeakebay.net](mailto:jsweeney@chesapeakebay.net)

The nutrient and sediment loads delivered to the Bay indicator are published at <http://www.chesapeakebay.net/status.cfm?sid=186>. The nutrient and sediment loads delivered to the Bay data files used in the indicator are located at <http://www.chesapeakebay.net/pubs/statustrends/186-data-2003.xls>. See "Chesapeake Bay Watershed Model Application and Calculation of Nutrient and Sediment Loadings, Appendix H: Tracking Best Management Practice Nutrient Reductions in the Chesapeake Bay Program, A Report of the Chesapeake Bay Program Modeling Subcommittee", USEPA Chesapeake Bay Program Office, Annapolis, MD, August 1998, available at <http://www.chesapeakebay.net/pubs/777.pdf>  
See USDA NRCS Field Office Technical Guide available at <http://www.nrcs.usda.gov/technical/efotg/>.

**FY 2006 Performance Measure: Prevent water pollution and protect aquatic ecosystem health of the Great Lakes using the Great Lakes 40 point scale.**

**Performance Database:** USEPA's Great Lakes National Program Office (GLNPO) will collect and track the eight (8) components of the index and publish the performance results as part of annual reporting under the Government Performance and Results Act (GPRA) and as online reporting of GLNPO's monitoring program, <http://epa.gov/glnpo/glindicators/index.html>. Extensive databases for the indicator components are maintained by GLNPO (phosphorus concentrations, contaminated sediments, benthic health, fish tissue contamination), by binational agreement with Environment Canada (air toxics deposition), and by local authorities who provide data to the USEPA (drinking water quality, beach closures). A binational team of scientists and natural resource managers is working to establish a long term monitoring program to determine extent and quality of coastal wetlands.

**Data Source:** Data for the index components are tracked internally and generally reported through the State of the Lakes Ecosystem Conference (SOLEC) process. The document, "State of the Great Lakes 2005-A Technical Report," presents detailed indicator reports prepared by primary authors, including listings of data sources. Depending on the indicators, data sources may include U.S. and Canadian federal agencies, state and provincial agencies, municipalities, research reports and published scientific literature. Information from the following indicators is used to evaluate the Index components:

Coastal Wetlands group of indicators:

*Coastal Wetland Invertebrate Community Health, Coastal Wetland Fish Community Health, Coastal Wetland Amphibian Diversity and Abundance Coastal Wetland Area by Type, Coastal Wetland Plant Community Health*

*Effects of Water Levels Fluctuations*

Phosphorus Concentrations and Loadings

Concentrations of Contaminants in Sediment Cores

Benthic Health group of indicators:

*Hexagenia, Abundances of the Benthic Amphipod Diporeia spp.*

Area of Concern Sediment Contamination (*This component is not included in SOLEC. Information from reports of contaminated sediment remediation is collected by USEPA-GLNPO and is used by GLNPO to evaluate the contaminated sediment index component of this Index.*)

Contaminants in Sport Fish

Beach Advisories, Postings and Closures

Drinking Water Quality

Atmospheric Deposition of Toxic Chemicals.

**Methods, Assumptions, and Suitability:** The Index is based on a 40 point scale where the rating uses select Great Lakes State of the Lakes Ecosystem indicators (i.e., coastal wetlands, phosphorus concentrations, Area of Concern (AOC) sediment contamination, benthic health, fish tissue contamination, beach closures, drinking water quality, and air toxics deposition). Each component of the Index is based on a 1 to 5 rating system, where 1 is poor and 5 is good. Authors of SOLEC indicator reports use best professional judgment to assess the overall status of the ecosystem component in relation to established endpoints or ecosystem objectives, when available. Each indicator is evaluated for Status (good, fair, poor, mixed) and Trend (improving, unchanging, deteriorating, undetermined). To calculate the Index, the data for each indicator are compared to the evaluation criteria for the numeric, 1 to 5, rating system. Each of the index components is included in the broader suite of Great Lakes indicators, which was developed through an extensive multi-agency process to satisfy the overall criteria of necessary, sufficient and feasible. Information on the selection process is in the document, "Selection of Indicators for Great Lakes Basin Ecosystem Health, Version 4."

**QA/QC Procedures:** GLNPO has an approved Quality Management System in place<sup>1</sup>(see reference #1 below) that conforms to the USEPA Quality Management Order and is audited every 3 years in accordance with Federal policy for Quality Management.

The SOLEC process and the process for collecting contaminated sediment remediation information both rely on secondary use of data, i.e., data for many of the indicators are collected, maintained and analyzed by agencies and organizations other than USEPA. Participating agencies and organizations follow their own QA/QC procedures to assure high quality data. A Quality Assurance Project Plan (QAPP) was developed to document procedures for data assessment and review for the indicators reports prepared for the State of the Great Lakes 2005 report. See "State of the Lakes Ecosystem Conference 2004 QAPP." Contaminated sediment remediation information is collected in conformance with GLNPO's Great Lakes Sediment Remediation Project Summary Support QAPP<sup>2</sup> (see reference #2 below).

**Data Quality Review:** GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews<sup>2</sup> (see reference #2 below). GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

An external Peer Review of SOLEC processes and products was conducted in 2003 by an international panel of experts familiar with large-scale regional or national indicator and reporting systems. Panel findings were generally positive and several recommendations were made to consider for future SOLEC events and reports. Many of the recommendations have been implemented, and others are being considered for feasibility. The final report by the review panel is available online at <http://epa.gov/glnpo/solec/index.html>. See "State of the Lakes Ecosystem Conference Peer Review Report" in the SOLEC 2004 section.

A second review of the suite of Great Lakes indicators was conducted by Great Lakes stakeholders in 2004. As a direct result of the findings and recommendations from the participants, several indicators were revised, combined or dropped, and a few others were added. The indicators were also regrouped to allow the user to more easily identify the indicators relevant to particular ecosystem components or environmental issues. The final report from the review is available online at <http://epa.gov/glnpo/solec/index.html>. See "State of the Lakes Ecosystem Conference Peer Review Report, Part 2: Stakeholder Review of the Great Lakes Indicators" in the SOLEC 2004 section.

**Data Limitations:** Data limitations vary among the indicator components of the Index. The data are especially good for phosphorus concentrations, fish tissue contamination, benthic health, and air toxics deposition. The data associated with other components of the index (coastal wetlands, AOC sediment contamination, beach closures, and drinking water quality) are more qualitative. Some data are distributed among several sources, and without an extensive trend line. Limitations for each of the index components are included in the formal indicator descriptions in the document, "Selection of Indicators for Great Lakes Basin Ecosystem Health, Version 4." The data provided in the sediment tracking database should be used as a tool to track sediment remediation progress at sites across the Great Lakes. Many of the totals for sediment remediation are estimates provided by project managers. For specific data uses, individual project managers should be contacted to provide additional information.

**Error Estimate:** Error statistics for the Great Lakes Index have not been quantified. Each unit of the 40 point scale represents 2.5 percent of the total, so any unit change in the assessment of one of the component indicators would result in a change of the index of that magnitude. The degree of environmental change required to affect an indicator assessment, however, may be significantly large.

**New/Improved Data or Systems:** The data system specifically for this index is being developed. Data continue to be collected through the SOLEC process by various agencies, including GLNPO. Efforts are currently in progress to integrate various Great Lakes monitoring programs to better meet SOLEC objectives and to increase efficiencies in data collection and reporting. Documentation regarding SOLEC is available on the Internet and from GLNPO<sup>4</sup> (see reference # 4 below).

#### **References:**

1. "Quality Management Plan for the Great Lakes National Program Office." EPA905-R-02-009. October 2002, Approved April 2003.
2. "Great Lakes Sediment Remediation Project Summary Support" March 2006 Quality Assurance Project Plan. Unpublished - in USEPA Great Lakes National Program Office files.
3. "*GLNPO Management Systems Review of 1999.*" Unpublished - in USEPA Great Lakes National Program Office files.
4. "State of the Lakes Ecosystem Conference 2004 QAPP." Unpublished. Prepared as part of Cooperative Agreement between USEPA and Environment Canada.

Canada and the United States. "State of the Great Lakes 2003." ISBN 0-662-34798-6, Environment Canada, Burlington, Ontario, Cat. No. En40-11/35-2003E, and U.S.

Environmental Protection Agency, Chicago, EPA 905-R-03-004. 2003. Available on CD and online at <[www.binational.net](http://www.binational.net)>.

Canada and the United States. "Implementing Indicators 2003 - A Technical Report." ISBN 0-662-34797-8 (CD-Rom), Environment Canada, Burlington, Ontario, Cat. No. En164-1/2003E-MRC (CD-Rom), and U.S. Environmental Protection Agency, Chicago, EPA 905-R-03-003. 2003. Available on CD from U.S. EPA/Great Lakes National Program Office, Chicago. Available online at <http://epa.gov/glnpo/solec/index.html>

Canada and the United States. "State of the Great Lakes 2005." Environment Canada, Burlington, Ontario (Cat No. En161-3/0-2005E-PDF) and U.S. Environmental Protection Agency, Chicago (EPA 905-R-06-001), 2006. Available online at <<http://epa.gov/glnpo/solec/index.html>>

Bertram, Paul and Nancy Stadler-Salt. "Selection of Indicators for Great Lakes Basin Ecosystem Health, Version 4." Environment Canada, Burlington, Ontario, and U.S. EPA, Chicago. 2000. Available online at <[www.binational.net](http://www.binational.net)>.

All SOLEC documents, background reports, indicator reports, indicator development processes, conference agenda, proceedings and presentations are available online at <http://epa.gov/glnpo/solec/index.html> The documents are sorted by SOLEC year and include the State of the Great Lakes reports which are released the following calendar year.

**FY 2006 Performance Measure: Reduce the average concentration of PCBs in whole lake trout and walleye samples from 2000 levels.**

**Performance Database:** Great Lakes National Program Office (GLNPO) Great Lakes Fish Monitoring Program (GLFMP) <sup>1</sup>(see reference #1 below). This program is broken into two separate elements, Element 1 – Open Water Trend Monitoring and Element 2 – Game Fish Fillet Monitoring. Each program collects and monitors contaminants in Great Lakes fish at alternating locations throughout the Great Lakes Basin; fish are collected at one set of sites during even years and at another set in odd years. Element 1 began with the collection of data in Lake Michigan in 1972 and the additional lakes were added in 1976. Element 2 began with the collection of data in all five of the Great Lakes in the early 1980's. In FY06, the database contained QA/QCed field data from fish collected through 2004 and all QA/QCed analytical data for fish collected between 1972 and 2003. A new grantee was selected for this program in 2005, thus delaying the release of analytical data collected in 2004 and 2005 until 2007. Data collected in 2006 is expected to be able to be used for reporting in 2008. Data are reported on a calendar year basis the second year after collection and are specific to the even or odd year sampling schedule (even year sites are only compared to other even year sites etc.).

**Data Source:** GLNPO is the principal source of data for the Great Lakes Fish monitoring program. The Great Lakes States and Tribes assist with fish collection. Previous cooperating organizations include the U.S. Geological Survey (USGS), the U.S. Fish and Wildlife Service (USFWS), and the Food and Drug Administration (FDA).

**Methods, Assumptions, and Suitability:** This indicator provides concentrations of selected organic contaminants in Great Lakes open water fish. The Great Lakes Fish Monitoring Program is broken into two separate elements that monitor potential exposure to contaminant

concentrations for wildlife (Element 1) and humans through consumption (Element 2). Only Element 1 is included in this indicator.

The first element, Open Lakes Trend Monitoring Program, was created to: (1) determine time trends in contaminant concentrations, (2) assess impacts of contaminants on the fishery using fish as biomonitors, and (3) assess potential risk to the wildlife that consume contaminated fish. The first element includes data from ten 600-700 mm lake trout (*Salvelinus namaycush*) whole fish composites (5 fish in each composite) from each of the lakes. Since sufficient lake trout are not found in Lake Erie, data for 400 – 500 mm walleye (*Stizostedion vitreum*) are used for that Lake.

All GLFMP data are quality-controlled and then loaded into the Great Lakes Environmental Database (GLENDa). Included in GLENDa are flags for each data point that can be used to evaluate the quality of the data. Each Great Lake is a unique environment with a distinct growth rate, food web, and chemical integrity. For this reason, a direct comparison of annual concentrations between basins is not appropriate. However, an average annual basin-wide percent decrease can be determined using an exponential decrease function, and the 1990 data as the baseline. The percent decrease of Element 1 can be calculated and compared to the 5 percent reduction target to determine if the target has been met. All years of data from all lakes are plotted on the same graph, with each year containing 5 data points. An exponential decrease is then found for the entire data set and the percent decrease is calculated from the best fit line. The Lake Michigan data set represents the worst case scenario in the Great Lakes Basin for the Open Lakes Trend Monitoring Program.

**QA/QC Procedures:** GLNPO has an approved Quality Management System in place<sup>2</sup> (see reference #2 below) that conforms to the USEPA Quality Management Order and is audited every 3 years in accordance with Federal policy for Quality Management. The Quality Assurance (QA) plan that supports the analytical portion of the fish contaminant program is approved and available online<sup>3</sup> (see reference #3 below). The draft field sampling Quality Assurance Project Plan (QAPP) is being revised and will be submitted to the GLNPO QA Officer for review upon the completion of the Quality Management Plan.

**Data Quality Review:** GLNPO's Quality Management System has been evaluated as "outstanding" in previous peer and management reviews<sup>4</sup> (see reference #4 below). GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

**Data Limitations:** Great Lakes Fish Monitoring Program data are not well-suited to portray localized changes. Nevertheless, data collected at a certain site (odd year or even year sites) can be compared to data collected from the same site. In addition, only very general comparisons can be made of contaminant concentrations between lakes. A recent review of the odd year Open Lake Trend Monitoring in Lake Erie data indicate an increased variability in the data between the years of 1999 and 2003 because during those years several individual samples (fish) fell outside of the desired size range leading to a higher or lower than average mean sample size for the composite.

**Error Estimate:** The data quality objective of the fish contaminant program was to detect a 20 percent change in each measured contaminant concentration between two consecutively sampled periods at each site. Based on changing environmental conditions, the data quality objective has been revised to have an 80 percent probability to detect a 10 percent change per year, over three to four sampling periods, at the 95 percent confidence level. An official outside

peer review of these data is tentatively scheduled for spring of 2007 to finalize the data quality objective for Element 1 and to create a data quality objective for Element 2.

**New/Improved Data or Systems:** The GLENDA database is a significant new system with enhanced capabilities. Existing and future fish data will be added to GLENDA.

**References:** “*The Great Lakes Fish Monitoring Program - A technical and Scientific Model For Interstate Environmental Monitoring.*” September, 1990. EPA503/4-90-004; “Quality Management Plan for the Great Lakes National Program Office.” EPA905-R-02-009. October 2002, Approved April 2003. <http://www.epa.gov/glnpo/qmp/>; “*Great Lakes Fish Monitoring Program – Quality Assurance Project Plan for Sample Collection Activities*”, Great Lakes National Program Office. [http://www.epa.gov/glnpo/glindicators/fishtoxics/GLFMP\\_QAPP\\_082504.pdf](http://www.epa.gov/glnpo/glindicators/fishtoxics/GLFMP_QAPP_082504.pdf); “*GLNPO Management Systems Review of 1999.*” Unpublished - in USEPA Great Lakes National Program Office files; “*Trends in Great Lakes Fish Contaminants*”, Dr. Deborah Swackhammer, University of Minnesota Environmental Occupational Health, School of Public Health, EPA Grant #GL97524201-2, 7/1/02. De Vault, D. S. 1984. Contaminant analysis of fish from Great Lakes harbors and tributary mouths. U.S. Environmental Protection Agency, Great Lakes National Program Office. USEPA 905/3-84-003, <http://www.epa.gov/glnpo/glindicators/fishtoxics/GLFMP%20QAPP%20v7.pdf>; De Vault, D. S., R. Hesselberg, P. W. Rodgers and T. J. Feist. 1996. Contaminant trends in lake trout and walleye from the Laurentian Great Lakes. *Journal of Great Lakes Research* 22: 884-895; De Vault, D. S., W. A. Willford, R. Hesselberg, E. Nortrupt and E. Rundberg. 1985. Contaminant trends in lake trout (*Salvelinus namaycush*) from the upper Great Lakes. *Archives of Environmental Contamination and Toxicology* 15: 349-356; De Vault, D. S., W. A. Willford, R. J. Hesselberg and D. A. Nortrupt. 1986. Contaminant trends in lake trout (*Salvelinus namaycush*) from the upper Great Lakes. *Archives of Environmental Contamination and Toxicology* 15: 349-356; GLNPO. 1981. A Strategy for Fish Contaminant Monitoring in the Great Lakes. USEPA Great Lakes National Program Office; “Quality Management Plan for the Great Lakes National Program Office.” EPA905-R-02-009. October 2002, Approved April 2003; Swackhammer, D. L. 2001. “*Trends in Great Lakes Fish Contaminants.*” Unpublished - in USEPA Great Lakes National Program Office files; Swackhammer, D.L. February 2002. “*Trends in Great Lakes Fish Contaminants.*” Unpublished - in USEPA Great Lakes National Program Office files; “*GLNPO Management Systems Review of 1999.*” Unpublished - in USEPA Great Lakes National Program Office files.

**FY 2006 Performance Measure: Reduce the average concentration of toxic chemicals in the air in the Great Lakes basin from 2000 levels.**

**Performance Database:** Great Lakes National Program Office (GLNPO) integrated atmospheric deposition network <sup>1</sup> (see reference #1 below) (IADN) operated jointly with Environment Canada. Reporting starts with 1992 data and includes concentrations of polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and organochlorine pesticides in air and precipitation; however, this Performance Measure addresses only PCBs. Monitoring results from 2004 were reported in 2006. Data are reported on a calendar year basis the second year after collection.

**Data Source:** GLNPO and Environment Canada are the principal sources of the data for IADN. Data also come through in-kind support and information sharing with other Federal agencies and Canada. Only data from US stations in IADN are being used for this measure.

**Methods, Assumptions, and Suitability:** There are five master IADN stations, one for each lake, which are supplemented by satellite stations in other locations. The master stations are located in remote areas and are meant to represent regional background levels. Concentrations from the master stations are used for the performance measure. Concentrations from the satellite stations in Chicago and Cleveland are also sometimes used to demonstrate the importance of urban areas to atmospheric deposition to the Lakes. Air samples are collected for 24 hours using high-volume samplers containing an adsorbent. Precipitation samples are collected as 28-day composites. Laboratory analysis protocols generally call for solvent extraction of the organic sampling media with addition of surrogate recovery standards. Extracts are then concentrated followed by column chromatographic cleanup, fractionation, nitrogen blow-down to small volume (about 1 mL) and injection (typically 1  $\mu$ L) into gas chromatography instruments.

All IADN data are loaded and quality controlled using the Research Database Management System (RDMQ), a Statistical Analysis System (SAS) program. RDMQ provides a unified set of quality assured data, including flags for each data point that can be used to evaluate the usability of the data. Statistical summaries of annual concentrations are generated by the program and used as input into an atmospheric loading calculation. The loadings calculation is described in detail in the Technical Summary referenced below. However, calculating loadings requires additional data and constants that introduce further error. Therefore, the averaged annual concentrations rather than the loadings are used in the performance measure. Concentrations can vary from year to year due to differences in weather (temperature, wind patterns, etc.), so comparing concentrations from one year to the next is not always appropriate. This performance measure examines the average percent decline for the long-term trend determined using an exponential decrease function. Each year the average percent decline is calculated after adding new data. A baseline percent decrease was determined using data through 2000, and the aim is that this rate of decrease will continue.

**QA/QC Procedures:** GLNPO has a Quality Management System in place, which conforms to the USEPA Quality Management Order and is audited every 3 years in accordance with Federal policy for Quality Management<sup>2</sup> (see reference #2 below). Quality Assurance Project Plans are in place for the laboratory grantee, as well as for the network as a whole. A jointly-funded QA officer conducts laboratory and field audits, tracks QA statistics, and carries out special QA studies. Data from all contributing agencies are quality-controlled using the SAS-based system.

**Data Quality Review:** GLNPO's Quality Management System has been evaluated as "outstanding" in previous peer and management reviews<sup>3</sup> (see reference #3 below). GLNPO has implemented all recommendations from these external audits and complies with Agency Quality Standards<sup>4</sup> (see reference #4 below). The IADN program has a joint Canadian-US quality system and binational Steering Committee that meets periodically in person or via conference calls to make decisions on network operation and data management and quality.

A regular set of laboratory and field blanks is taken and recorded for comparison to the IADN field samples. In addition, a suite of chemical surrogates and internal standards is used extensively in the analyses. There are common performance standards for PCBs, organochlorine pesticides, and PAHs. A common calibration standard for PCBs is now used. A jointly-funded QA officer conducts laboratory and field audits, tracks QA statistics, and carries out special QA studies. As previously mentioned, data from all contributing agencies are quality-controlled using a SAS-based system.

**Data Limitations:** The sampling design is dominated by rural sites that under-emphasize urban contributions to deposition; thus, although the data are very useful for trends information, there is less assurance of the representativeness of deposition to the whole lake. U.S. and Canadian laboratories use somewhat different sampling and analytical methods; QA studies have found that differences in resulting data are attributable mostly to the sampling differences. There are gaps in open lake water column organics data, thus limiting our ability to calculate atmospheric loadings. This gap is being addressed through the recent implementation by GLNPO of the Great Lakes Aquatic Contaminant Surveillance (GLACS) program, which will collect water contaminant data in the Lakes.

In the past, there has been a lag in the data from the Canadian sites (Burnt Island on Lake Huron and Point Petre on Lake Ontario). U.S. data is usually reported two years after it is collected (e.g., 2004 data were reported in 2006); the Canadian data may not be available on this schedule; consequently only US data is being used to report on this measure.

**Error estimate:** The performance measure examines the long-term trend in concentrations. Concentrations have an error of +/- 40 percent, usually less. Differences between laboratories have been found to be 40 percent or less. This is outstanding given the very low levels of these pollutants in the air and the difficulty in analysis. Improvements in quality assurance (use of a clean lab for Canadian precipitation analysis, making calibration standards consistent among agencies, etc.) are helping to further close this gap, and recent intercomparison site data reflect this.

**New/Improved Data or Systems:** Joint data that has passed quality review will be available from Canada's National Atmospheric Chemistry (NAtChem) Database and Analysis System, which includes atmospheric data from many North American networks and is linked from IADN's website at: [http://www.msc.ec.gc.ca/iadn/data/form/form\\_e.html](http://www.msc.ec.gc.ca/iadn/data/form/form_e.html). The IADN homepage can be found at [www.msc.ec.gc.ca/iadn/](http://www.msc.ec.gc.ca/iadn/). Copies of IADN data are now held in U.S. and Canadian databases. Environment Canada management is working to reduce the data lag from the Canadian IADN stations.

**References:** "Great Lakes National Program Office Indicators. Air Indicators." <http://www.epa.gov/glnpo/glindicators/air.html>; Details of these analyses can be found in the Laboratory Protocol Manuals or the agency project plans, which can be found on the IADN resource page at <http://www.epa.gov/glnpo/monitoring/air/iadn/iadn.html>; Overall results of the project can be found in "Technical Summary of Progress under the Integrated Atmospheric Deposition Program 1990-1996" and the "Technical Summary of Progress under the Integrated Atmospheric Deposition Network 1997-2002". Both (as well as the Atmospheric Loadings reports) can be found on the IADN resource page; "Quality Management Plan for the Great Lakes National Program Office." EPA905-R-02-009. October 2002, Approved April 2003; "GLNPO Management Systems Review of 1999." Unpublished - in USEPA Great Lakes National Program Office files; "Integrated Atmospheric Deposition Network Quality Assurance Program Plan - Revision 1.1." Environment Canada and USEPA. June 29, 2001. Unpublished - in USEPA Great Lakes National Program Office files.

**FY 2006 Performance Measure: Cumulative total of Areas of Concern within the Great Lakes Basin that have been restored and delisted.**

**Performance Database:** USEPA's Great Lakes National Program Office will track the cumulative total Areas of Concern (AOC) and post that information <http://www.epa.gov/glnpo/aoc/index.html> Forty-three AOCs have been identified: 26 located

entirely within the United States; 12 located wholly within Canada; and five that are shared by both countries. Since 1987, GLNPO has tracked the 31 that are within the US or shared. On June 19, 2006, the Oswego River, NY AOC became the first U.S. AOC to be officially removed from the list of U.S. AOCs. Information is reported on a calendar year basis, however the system is being designed for semi-annual or more frequent updates.

**Data Source:** Internal tracking and communications with Great Lakes States, the US Department of State and the International Joint Commission (IJC).

**Methods, Assumptions, and Suitability:** USEPA's Great Lakes National Program Office is in regular communication with the Great Lakes States, the US Department of State and the IJC, and is responsible for coordinating and overseeing the de-listing of AOCs. Generally speaking, under the Great Lakes Water Quality Agreement, an AOC is an area in the Great Lakes determined to have significant beneficial use impairments, such as restrictions on fish and wildlife consumption, fish tumors, eutrophication, beach closings, added costs to agriculture or industry. In 1989, the IJC established a review process and developed AOC listing/delisting criteria (<http://www.ijc.org/rel/boards/annex2/buis.htm#table1>) for existing and future AOCs. In 2001, the U.S. Policy Committee, led by GLNPO and including State, Tribal, and Federal agencies responsible for Great Lakes environmental issues, developed delisting guidelines for domestic AOCs (<http://www.epa.gov/glnpo/aoc/delist.html>) and for the binational AOCs shared by Michigan and Ontario <http://www.epa.gov/glnpo/aoc/delist.html> - appendix 5).

**QA/QC Procedures:** GLNPO has an approved Quality Management System in place<sup>1</sup> (see reference #1 below) that conforms to the USEPA Quality Management Order and is audited every 3 years in accordance with Federal policy for Quality Management.

**Data Quality Review:** GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews<sup>2</sup> (see reference #2) below. GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

**References:** GLNPO will develop and maintain the appropriate tracking system once there are any de-listed U.S. or binational Areas of Concern. Information regarding Areas of Concern is currently available online at: <http://www.epa.gov/glnpo/aoc/index.html>; "Quality Management Plan for the Great Lakes National Program Office." EPA905-R-02-009. October 2002, Approved April 2003; "GLNPO Management Systems Review of 1999." Unpublished - in USEPA Great Lakes National Program Office files.

**FY 2006 Performance Measures:**

- **Acres of habitat protected or restored in National Estuary Program (NEP) study areas. (Ocean and Coastal PART measure)**
- **Program dollars per acre of habitat protected or restored. (Ocean and Coastal PART efficiency measure)**

**Performance Database:** The Office of Wetlands Oceans and Watersheds has developed a standardized format for data reporting and compilation, defining habitat protection and restoration activities and specifying habitat categories. The key field used to calculate annual performance is habitat acreage. Annual results have been reported since 2001 for the NEP (results are calculated on a fiscal year basis).

Information regarding habitat protection is accessible on a web page that highlights habitat loss/alteration, as well as the number of acres protected and restored by habitat type <http://www.epa.gov/owow/estuaries/pivot/overview/intro.htm>. This allows EPA to provide a visual means of communicating NEP performance and habitat protection and restoration progress to a wide range of stakeholders and decision-makers.

**Data Source:** NEP documents such as annual work plans (which contain achievements made in the previous year), annual progress reports and other implementation tracking materials, are used to document the number of acres of habitat restored and protected. EPA aggregates the data provided by each NEP to arrive at a national total for the entire Program. EPA is confident that the data presented are as accurate as possible. Each NEP reviews the information prior to reporting to EPA. In addition, EPA conducts regular reviews of NEP implementation to help ensure that information provided in these documents is accurate, and progress reported is in fact being achieved.

**Methods, Assumptions and Suitability:** Measuring the number of acres of habitat restored and protected may not directly correlate to improvements in the health of the habitat reported, or of the estuary overall, but it is a suitable measure of on-the-ground progress. Habitat acreage does not necessarily correspond one-to-one with habitat quality, nor does habitat (quantity or quality) represent the only indicator of ecosystem health. Nevertheless, habitat acreage serves as an important surrogate and a measure of on-the-ground progress made toward EPA's annual performance goal of habitat protection and restoration in the NEP. EPA has defined and provided examples of *protection* and *restoration* activities for purposes of measure tracking and reporting (see citation for the PIVOT website in references below.) "Restored and protected" is a general term used to describe a range of activities. The term is interpreted broadly to include created areas, protected areas resulting from acquisition, conservation easement or deed restriction, submerged aquatic vegetation coverage increases, permanent shellfish bed openings, and anadromous fish habitat increases.

The NEP "Habitat Acres Protected or Restored" efficiency measure will be calculated by dividing the total ocean and coastal protection program dollars by the total NEP acres protected or restored. The measure is based on the habitat data collected by the NEPs, as described above and reported in the annual habitat measure, and the total program dollars, which is the sum of the NEP/Coastal budget (including the additional funds for Long Island Sound), the Marine Pollution budget, and the program match as reported by the NEPs.

**QA/QC Procedures:** Primary data are prepared by the staff of the NEP based on their own reports and from data supplied by other partnering agencies/organizations (that are responsible for implementing the action resulting in habitat protection and restoration). The NEP staff are requested to follow EPA guidance to prepare their reports, and to verify the numbers. EPA then confirms that the national total accurately reflects the information submitted by each program. EPA actions are consistent with data quality and management policies.

**Data Limitations:** It is still early to determine the full extent of data limitations. Current data limitations include: information that may be reported inconsistently (based on different interpretations of the protection and restoration definitions), acreage that may be miscalculated or misreported, and acreage that may be double counted (same parcel may also be counted by partnering/implementing agency or need to be replanted multiple years). In addition, measuring the number of acres of habitat restored and protected may not directly correlate to improvements in the health of the habitat reported (particularly in the year of reporting), but is rather a measure of on-the-ground progress made by the NEPs.

**New/Improved Data or Systems:** NEPs provide latitude and longitude data (where possible) for each project. These data are then mapped to highlight where these projects are located in each NEP study area. Not only does this assist both the individual NEP and EPA in obtaining a sense of geographic project coverage, but it provides a basis from which to begin exploring cases where acreage may be double-counted by different agencies. An on-line reporting system—NEPORT-- has been developed for the NEPs= use that will assist in tracking habitat projects. EPA has taken steps to align NEPORT data fields with those of the National Estuarine Restoration Inventory (NERI), developed for interagency use.

**References:** Aggregate national and regional data for this measurement, as well as data submitted by the individual National Estuary Programs, is displayed numerically, graphically, and by habitat type in the Performance Indicators Visualization and Outreach Tool (PIVOT). PIVOT data are publicly available at <http://www.epa.gov/owow/estuaries/pivot/overview/intro.htm>. The Office of Water Quality Management Plan (July 2001) is available on the Intranet at <http://intranet.epa.gov/ow/infopolicy.html>.

**FY 2006 Performance Measure: By 2008, working with partners, achieve a net increase of acres of wetlands with additional focus on biological and functional measures and assessment of wetland condition.**

**Performance Database:** The U.S. Fish and Wildlife Service produces information on the type and extent of the Nation's wetlands and deepwater habitats. The Emergency Wetland Resources Act of 1986 requires the Service to conduct status and trend studies of the Nation's wetlands, and report the results to Congress each decade.. To date the Fish and Wildlife Service has produced four such documents. On Earth Day 2004, President Bush announced a wetlands initiative that established a federal policy beyond "no net loss" of wetlands. As part of that same Earth Day message, the President directed the Service to accelerate the completion of the status and trends and to undertake this study at more frequent intervals. This information is used by Federal, State, and local agencies, academic institutions, U.S. Congress, and the private sector.

The status and trends report is designed to provide recent and comprehensive estimates of the abundance of wetlands in the 48 conterminous States. This status and trends report indicates whether there is an actual increase in wetland acreage or if wetlands are continuing to decrease. Up-to-date status and trends information is needed to periodically evaluate the efficacy of existing Federal programs and policies, identify national or regional wetland issues, and increase public awareness of and appreciation for wetlands.

The last status and trends report<sup>24</sup> provided the most recent and comprehensive estimates of the current gains and losses for different types of wetlands in the United States on public and private lands from calendar year 1998 to 2004. In calendar year 1997, there were an estimated 105.5 million acres of wetlands in the conterminous United States. In calendar year 2004 107.7 million acres of wetlands were estimated. Of this total, approximately 102.4 million acres (95 percent) are freshwater wetlands and 5.3 million acres (5 percent) are saltwater wetlands. Although the report shows that overall gains in wetland acres exceeded overall losses from 1998 through 2004 (approximately 32,000 acres/yr), this gain is primarily attributable to an increase in unvegetated freshwater ponds, some of which (such as aquaculture ponds) may not

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<sup>24</sup> Dahl, T.E. 2006. Status and trends of wetlands in the conterminous United States 1998 to 2004. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 112pp.

function as wetlands and others of which may have varying functional value. The Report also notes the following trends in other wetland categories: freshwater vegetated wetlands declined by 0.5 percent, a smaller rate of loss than in preceding years; and estuarine vegetated wetlands declined by 0.7 percent, an increased rate of loss from the preceding years. The Status and Trends Report does not assess the quality or condition of wetlands. EPA will continue working with FWS and other federal agencies to refine the methodology used in preparing future reports, to subdivide current wetland categories, to provide further clarity and information on the types of wetlands that are found on the landscape and to describe the functions and values they provide. In addition EPA is preparing to undertake a National wetland condition study that is scheduled for completion in 2013.

**Data Source:** The National Status and Trends Report is developed and published by the U.S. Fish and Wildlife Service. This is the only Federal study that provides statistically valid estimates with a published standard error for all wetlands in the conterminous United States. Aerial imagery is the primary data source, and it is used with reliable collateral data such as topographic maps, coastal navigation charts, published soil surveys, published wetland maps, and State, local or regional studies. A random number of sites are also field verified. All photography is cataloged, numbered, tagged, and traced in a database management system.

For each plot, aerial imagery is interpreted and annotated in accordance with procedures published by the Fish and Wildlife Service. The results are compared with previous era imagery, and any changes recorded. The differences between the data sets are analyzed and a statistical estimate of the change is produced.

The five major kinds of wetlands are: 1) freshwater (or palustrine), 2) saltwater (or estuarine), 3) riverine, 4) lacustrine (or lakes and other deepwater habitats), and 5) marine wetlands. For analysis and reporting purposes, these types of wetlands were further divided into subcategories such as freshwater forested wetland, freshwater emergent wetland, estuarine and marine intertidal wetlands.

**Methods, Assumptions and Suitability:** An interagency group of statisticians developed the design for the national status and trends study published in 2000. The study was based on a scientific probability sample of the surface area of the 48 coterminous States. The area sampled was about 1.93 billion acres and the sampling did not discriminate based on land ownership. The study used a stratified, simple random sampling design. About 754,000 possible sample plots comprised the total population. Geographic information system software was used to organize the information of about 4,682 random sample plots. The plots were examined with the use of remote sensed data in combination with field work. Estimates of change in wetlands were made over a specific time period.

**QA/QC Procedures:** The Service has developed and implemented quality assurance measures that provide appropriate methods to take field measurements, ensure sample integrity and provide oversight of analyses, which includes reporting of procedural and statistical confidence levels. The objective was to produce comprehensive, statistically valid acreage estimate of the Nation's wetlands. Because of the sample-based approach, various quality control and quality assurance measures were built into the data collection, review, analysis, and reporting stages. This includes field verification of the plots. Six Federal agencies assist with field verification work.

**Data Limitations:** Certain habitats were excluded because of the limitations of aerial imagery as the primary data source to detect wetlands. This was consistent with previous wetland status and trends studies conducted by FWS.

**Error Estimate:** Estimated procedural error ranged from 4 to 6 percent of the true values when all quality assurance measures have been completed. Procedural error was related to the ability to accurately recognize and classify wetlands both from multiple sources of imagery and on the ground evaluations. Types of procedural errors were missed wetlands, inclusion of upland as wetland, misclassification of wetlands, or misinterpretation of data collection protocols. The amount of procedural error is usually a function of the quality of the data collection conventions; the number, variability, training and experience of data collection personnel; and the rigor of any quality control or quality assurance measures.

**New/Improved Data or Systems:** Advances in computerized cartography were used to improve data quality and geospatial integrity. Newer technology allowed the generation of existing digital plot files at any scale to overlay directly over an image base.

**References:** <http://wetlands.fws.gov/index.html>;  
<http://wetlands.fws.gov/bha/SandT/SandTReport.html>;  
[http://wetlands.fws.gov/Pubs\\_Reports/publi.htm](http://wetlands.fws.gov/Pubs_Reports/publi.htm).

**FY 2006 Performance Measure:** **Annually, beginning in FY04 and in partnership with the Corps of Engineers and other partners, achieve no net loss of wetlands in the Clean Water Act Section 404 regulatory program.**

**Performance Database:** Since 1989, the goal of the Clean Water Act Section 404 program has been no net loss of wetlands.

Historically, the Corps has collected limited data on wetlands losses and gains in its Regulatory Analysis and Management System (RAMS) permit tracking database. The Corps has compiled national Section 404 wetland permitting data for the last 10 years reflecting acres of wetland impacts avoided (through the permit process), acres permitted for impacts, and acres mitigated. However, limitations in methods used for data collection, reporting and analysis resulted in difficulties in drawing reliable conclusions regarding the effects of the Section 404 program.

**Data Source:** Data included in RAMS is generally collected by private consultants hired by permit applicants or Corps Regulatory Staff. Data input is generally done by Corps staff.

**Methods, Assumptions and Suitability:** RAMS was designed to be an administrative aid in tracking permits, thus it lacks many of the fields necessary to adequately track important information regarding wetland losses and gains. Also, the database was modified differently for each of the 38 Corps Districts making national summaries difficult. Furthermore, the database is also proprietary making it difficult to retrofit without utilizing its original developers.

**QA/QC Procedures:** Historically, there has not been a high level of QA/QC with regard to data input into RAMS. Its antiquated format and numerous administrative fields discourage use. Lack of standard terms and classification also make all aspects of data entry problematic.

**Data Quality Reviews:** Independent evaluations published in 2001 by the National Academy of Sciences (NAS) and the General Accounting Office (GAO) provided a critical evaluation of the effectiveness of wetlands compensatory mitigation (the restoration, creation, or enhancement of

wetlands to compensate for permitted wetland losses) for authorized losses of wetlands and other waters under Section 404 of the Clean Water Act. The NAS determined that available data was insufficient to determine whether or not the Section 404 program was meeting its goal of no net loss of either wetland area or function. The NAS added that available data suggested that the program was not meeting its no net loss goal. Among its suite of recommendations, the NAS noted that wetland area and function lost and regained over time should be tracked in a national database and that the Corps should expand and improve quality assurance measures for data entry.

**Data Limitations:** As previously noted, RAMS currently provides the only national data on wetlands losses and gains in the Section 404 Program. Also, as previously noted, there are a number of concerns regarding the conclusions that can be drawn from these numbers. Data quality issues include: (1) Inability to separate restoration, creation, enhancement and preservation acreage from the aggregate "mitigation" acreage reported; (2) Lack of data regarding how much designated mitigation acreage was actually undertaken, and how much of that total was successful; (3) Lack of data regarding how much of the permitted impacts actually occurred; (4) Limitations on identifying acres "avoided," because the figure is only based on the difference between original proposed impacts and impacts authorized. Often, permit applicants who are aware of the 404 program's requirements to avoid and minimize impacts to wetlands, make initial site selection and site design decisions that minimize wetland impacts prior to submitting a permit application. Such avoidance decisions benefit applicants, as their applications are more likely to be accepted and processed with minor changes. This behavioral influence that the program engenders is difficult to capture and quantify, but contributes considerable undocumented "avoided" impacts.

**New/Improved Data or Systems:** The EPA and the Corps have acknowledged the need for improved 404 tracking. The Corps is currently piloting a new national permit tracking database called ORM (Operation and maintenance business information link, Regulatory Module) to replace its existing database (RAMS). The Corps is partnering with EPA to ensure that the version of ORM that is ultimately deployed will adequately track wetlands and other aquatic resource losses and mitigation. ORM 1.0 has already been deployed in approximately half of the Corps' 38 districts. The Corps expects to deploy ORM 1.0 in the remaining districts in Fall 2006. Also during Fall 2006, Corps plans to beta test ORM 2.0 in selected Districts before upgrading all Districts to ORM 2.0 by the first quarter of 2007. This should enable national reporting in early 2008. Unlike ORM 1.0, ORM 2.0 will have expanded GIS capabilities and additional mandatory data fields for impact and mitigation data. EPA, other federal and state agencies, as well as the public will also have expanded access to data in ORM 2.0 via a system of web-services and web-mapping tools.

ORM 2.0 is being designed to provide improved tracking regarding: Type of impacts (i.e., work type); Type, quantity and location of aquatic resources impacted (Using Cowardin classification system); Type, quantity and location of aquatic resource mitigation (Using Cowardin classification system); Type and quantity of mitigation by method (i.e., restoration, creation, enhancement, or preservation); Differentiating stream mitigation (in linear feet) from wetlands mitigation (in acres); Spatial tracking via GIS enhancements for both impact and mitigation sites (*planned*); Functional losses (debits) at the impact site and functional gains at the mitigation site (credits) if assessment tool is available and applied.

#### **GOAL 4 OBJECTIVE 4**

##### **FY 2006 Performance Measures:**

- Completed dose-response assessments, provisional values, or pathogen risk assessments.
- Comprehensive guidance document for building owners and managers on restoration of buildings after terrorist contamination with biological or chemical hazards.
- Comprehensive guidance document for emergency and remedial response personnel and water utility owners and operators for the restoration of water systems after terrorist contamination with biological or chemical hazards.
- Comprehensive guidance package including data, methodologies, and other risk assessment tools that will assist emergency responders in establishing remediation goals at incident sites.
- Report on a protocol to screen environmental chemicals for their inability to interact with the male hormone receptor.

**Performance Database:** Program output; no internal tracking system

## GOAL 5 OBJECTIVE 1

### FY 2006 Performance Measures:

- Percentage of regulated entities receiving direct compliance assistance from EPA reporting that they improved environmental management practices as a result of EPA assistance.
- Percentage of regulated entities receiving direct assistance from EPA reporting that they reduced, treated, or eliminated pollution, as a result of EPA assistance.

**Performance Database:** EPA headquarters and regions will manage data on regulated entities receiving direct compliance assistance from EPA through ICIS.

**Data source:** Headquarters and EPA=s regional offices will enter information in ICIS upon completion and delivery of media and sector-specific compliance assistance including workshops, training, on-site visits and distribution of compliance assistance tools. ICIS is designed to capture outcome measurement information such as increased awareness/understanding of environmental laws, changes in behavior and environmental improvements as a result of the compliance assistance provided.

**Methods, Assumptions and Suitability:** These measures are automatically produced in the ICIS database which records the number of entities that received direct assistance from EPA and report that they improved an environmental management practice and/or report that they reduced, treated or eliminated pollution as a result of EPA assistance. ICIS produces the percentage by dividing the number of respondents to each of two follow-up survey questions by the number of respondents. The figure is aggregated nationally from the regional data. A percentage measure was chosen to track the goal for year to year comparability as opposed to a direct number which varies year to year.

**QA/QC:** Automated data checks and data entry guidelines are in place for ICIS.

**Data Quality Review:** Information contained in the ICIS is reviewed by regional and headquarters staff for completeness and accuracy. In FY 2003, OECA instituted a requirement for semiannual executive certification of the overall accuracy of information to satisfy the GPRA, the Agency's information quality guidelines, and other significant enforcement and compliance policies on performance measurement. ICIS data are reviewed quarterly and certified at mid-year and end of year.

**New/Improved Data or Systems:** EPA plans to improve and/or modify elements of the compliance assistance module in ICIS based on use of the system.

**References:** US EPA, ICIS Compliance Assistance Module, February 2004; US EPA, Compliance Assistance in the Integrated Compliance Information System Guidance, February 20, 2004. US EPA, 2005 Guidance Addendum for Reporting Compliance Assistance in the ICIS, March 2005.

**FY 2006 Performance Measures:**

- **Percentage of concluded enforcement cases requiring that pollution be reduced, treated, or eliminated. (PART)**
- **Pounds of pollution estimated to be reduced, treated, or eliminated as a result of concluded enforcement actions. (PART)**
- **Percentage of concluded enforcement cases requiring implementation of improved environmental management practices. (PART)**
- **Dollars invested in improved environmental performance or improved environmental management practices as a result of concluded enforcement actions (i.e., injunctive relief and SEPs).**
- **Pounds of pollutants reduced, treated, or eliminated as a result of audit agreements. (PART)**

**Performance Databases:** The Integrated Compliance Information System Federal Enforcement & Compliance (ICIS FE&C) database tracks EPA judicial and administrative civil enforcement actions. The newly enhanced Criminal Case Reporting System (CCRS) tracks criminal enforcement actions.

**Data Source:** Most of the essential data on environmental results in ICIS FE&C is collected through the Case Conclusion Data Sheet (CCDS), which Agency staff begin preparing after the conclusion of each civil, judicial and administrative enforcement action. EPA implemented the CCDS in 1996 to capture relevant information on the results and environmental benefits of concluded enforcement cases. Information from the CCDS is used to track progress for several of the performance measures. The CCDS form consists of 22 specific questions which, when completed, describe specifics of the case; the facility involved; information on how the case was concluded; the compliance actions required to be taken by the defendant(s); the costs involved; information on any Supplemental Environmental Project to be undertaken as part of the settlement; the amounts and types of any penalties assessed; and any costs recovered through the action, if applicable. The CCDS documents whether the defendant/respondent, in response to an order for injunctive relief or otherwise in response to the enforcement action, will: (1) implement controls that will reduce pollutants; and/or (2) improve environmental management practices to curtail, eliminate or better monitor and handle pollutants in the future.

The Criminal Enforcement Program also collects information on pollution reductions and the percentage of concluded criminal enforcement cases requiring improved environmental management practices on a separate case conclusion data form. The criminal enforcement case conclusion form was used in FY06.

**Methods, Assumptions and Suitability:** For enforcement actions which result in pollution reductions, staff estimate the amount of pollution reduced for an immediately implemented improvement, or for an average year once a long-term solution is in place. There are

established procedures to be used by EPA staff to calculate, by statute, e.g., Clean Water Act (CWA), the pollutant reductions or eliminations. The calculation determines the difference between the current amount of compliance quantity of pollutants released and the post enforcement action amount in compliance quantity of pollutants released. This difference is then converted into standard units of measure.

**QA/QC Procedures:** QA/QC procedures (See references) are in place for both the CCDS and ICIS FE&C data entry. There is a CCDS Training Booklet (See references) and a CCDS Quick Guide (See references), both of which have been updated and distributed throughout regional and headquarters offices. The criminal enforcement program has prepared a companion guide for use by its field agents. Separate CCDS Calculation and Completion Checklists (See references) are required to be filled out when the CCDS is completed. Criminal enforcement measures are quality assured by the program at the end of the fiscal year.

Quality Management Plans (QMPs) are prepared for each office within The Office of Enforcement and Compliance Assurance (OECA). The Office of Compliance's (OC) QMP, effective for 5 years, was approved July 29, 2003 by the Office of Environmental Information (OEI) and is required to be re-approved in 2008. To satisfy the Government Performance and Results Act (GPRA), the Agency's information quality guidelines, and other significant enforcement and compliance policies on performance measurement, OECA instituted a requirement for semiannual executive certification of the overall accuracy of ICIS information. In addition, in FY 2003, OC established a quarterly data certification process to ensure timely input, review, and reliability of EPA's enforcement and compliance information.

**Data Quality Review:** Information contained in the CCDS and ICIS FE&C are required by policy to be reviewed by regional and headquarters staff for completeness and accuracy. ICIS data are quality-reviewed quarterly, and reviewed and certified at mid-year and end-of-year.

**Data Limitations:** Pollutant reductions or eliminations reported in CCDS are projected estimates of pollutants to be reduced or eliminated if the defendant carries out the requirements of the settlement. (Information on expected outcomes of state enforcement is not available.) The estimates are based on information available at the time a case is settled or an order is issued. In some instances, this information will be developed and entered after the settlement, during continued discussions over specific plans for compliance. Because of the time it takes to agree on compliance actions, there may be a delay in completing the CCDS. Additionally, because of unknowns at the time of settlement, different levels of technical proficiency, or the nature of a case, OECA's expectation is that the overall amount of pollutants to be reduced or eliminated will be prudently underestimated based on CCDS information.

**New/Improved Data or Systems:** In November 2000, EPA completed a comprehensive guide on the preparation of the CCDS estimates. This guide, issued to headquarters and regional staff, was made available in print and CD-ROM, and was supplemented in FY 2002 and updated in FY 2004 (See references). The guide contains work examples to ensure better calculation of the amounts of pollutants reduced or eliminated through concluded enforcement actions. EPA trained each of its ten regional offices during FY 2002. OC's QMP was approved by OEI July 29, 2003, and is effective for five years. (See references). A new criminal enforcement case management, tracking and reporting system (CCRS) has come on line during FY 2006 that will replace the existing criminal docket (CRIMDOC). This new system is more user friendly and allows for greater tracking, management, and reporting capabilities.

In June, FY 2006, a new version of the ICIS data system, ICIS FE&C, became operational. The new data system has all of the functionality of old ICIS (ICIS 1.0) but also adds functionality for tracking EPA enforcement and compliance activities. In addition, another component of ICIS, "ICIS-NPDES" is becoming the database of record for the CWA National Pollutant Discharge Elimination System (NPDES) program, including all federal and state enforcement, compliance and permitting data. States will be migrated in phases to ICIS NPDES from the legacy data system, the Permit Compliance System (PCS), over a period of about two years. As a state's data is migrated from PCS to ICIS-NPDES, so too is its NPDES federal compliance and enforcement data for that state.

**References:** *Quality Assurance and Quality Control procedures: Data Quality: Life Cycle Management Guidance*, (IRM Policy Manual 2100, dated September 28, 1994, reference Chapter 17 for Life Cycle Management). CCDS: CCDS, Training Booklet, issued November 2000; Quick Guide for CCDS, issued November 2000, and "Guide for Calculating Environmental Benefits of Enforcement Cases: FY2005 CCDS Update" issued August 2004 available: <http://intranet.epa.gov/oeca/oc/resources/ccds/ccds.pdf>. Information Quality Strategy and OCA's Quality Management Plans: Final Enforcement and Compliance Data Quality Strategy, and Description of FY 2002 Data Quality Strategy Implementation Plan Projects, signed March 25, 2002. ICIS: U.S. EPA, OECA, ICIS Phase I, implemented June 2002. Internal EPA database; non-enforcement sensitive data available to the public through the Freedom of Information Act (FOIA).

**FY 2006 Performance Measure: Percentage of regulated entities taking complying actions as a result of on-site compliance inspections and evaluations.**

**Performance Databases:** ICIS FE&C and manual reporting by regions.

**Data Sources:** EPA regional offices, Office of Civil Enforcement - Air Enforcement Division (Mobile Source program), Office of Compliance - Agriculture Division (Good Laboratory Practices), and the Compliance Assessment and Media Programs Division (Wood Heaters).

**Methods, Assumptions and Suitability:** The Inspection Conclusion Data Sheet, (ICDS) will be used to analyze results from inspections/evaluations conducted under EPA's statutes. EPA will analyze ICDS from on-site complying actions taken by facilities, deficiencies observed, and compliance assistance provided. The EPA inspectors complete the ICDS for each inspection or evaluation conducted, and the information is entered into ICIS or reported manually. This measure was selected because it directly counts the number of times compliance assistance has been provided and allows for the analysis of the data to determine trends over time.

**QA/QC Procedures:** The ICIS FE&C data system has been developed per Office of Information Management Lifecycle Management Guidance, which includes data validation processes, internal screen audit checks and verification, system and user documents, data quality audit reports, third party testing reports, and detailed report specifications for showing how data are calculated.

**Data Quality Review:** The information in the CCDS, ICDS and ICIS FE&C is required by policy to be reviewed by regional and headquarters staff for completeness and accuracy. In FY2003, to satisfy the GPRA, the Agency's information quality guidelines, and other significant enforcement and compliance policies on performance measurement, OECA instituted a requirement for semiannual executive certification of the overall accuracy of information. ICIS FE&C data are reviewed quarterly and certified at mid-year and end of year.

**Data Limitations:** ICIS FE&C is the official database of record for all inspections not reported into one of the legacy data bases (with the exception of the Underground Injection Control (UIC) inspections in some regions). Legacy databases still operational include Air Facility System (AFS), FS, PCS, RCRAInfo, National Compliance Data Base System (NCDB), and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) / Toxic Substances Control Act (TSCA) Tracking System (FTTS). Beginning in 2007, NCDB/FTTS inspection data will be reported into ICIS FE&C. Regions have been encouraged to report all inspection ICDS information into ICIS. If regions continue to use manual reporting for ICDS, it may result in redundant, incomplete, or contradictory data.

**New/Improved Data or Systems:** In June FY 2006, a new version of the ICIS data system, ICIS FE&C became operational. The new data system has all of the functionality of old ICIS (ICIS 1.0) but adds functionality for tracking EPA enforcement and compliance activities. Further, ICIS-NPDES is beginning to replace the PCS as the database of record for the NPDES program, including all federal and state enforcement, compliance and permitting data. (States will be migrating over to ICIS-NPDES in phases, over a period of about two years.)

**References:** ICIS: U.S. EPA, OECA, ICIS FE&C, implemented June 2006; ICIS: U.S. EPA, OECA, ICIS-NPDES, implemented June 2006; Memo dated October 11, 2005: Entering Manually Reported Federal Inspections into ICIS in FY 2006; Internal EPA database; Non-enforcement sensitive data available to the public through the Freedom of Information Act (FOIA).

## **GOAL 5 OBJECTIVE 2**

### **FY 2006 Performance Measures:**

- **Percent reduction in TRI chemicals in production-related wastes generated by the business sector per unit of production ("Green Index").**
- **Percent reduction in both Toxics Release Inventory (TRI) chemical releases to the environment from the business sector per unit of production ("Clean Index").**
- **Number of pounds reduced (in millions) in generation of priority list chemicals from 2001 baseline of 84 million pounds.**

**Performance Database:** TRIM: Toxics Release Inventory Modernization, formerly TRIS (Toxics Release Inventory System) provides facility/chemical-specific data quantifying the amount of TRI-listed chemicals entering wastes associated with production process in each year. The total amount of each chemical in production-related wastes can be broken out by the methods employed in managing such wastes, including recycling, energy recovery, treatment, and disposal/release. Amounts of these wastes that are not recycled are tracked for these performance measures. The performance measure, "Number of pounds reduced in generation of priority list chemicals..." uses the Chemical Abstract System (CAS) numbers for the 23 chemicals identified by EPA as priority chemicals (<http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm>).

**Data Source:** Regulated facilities report facility-specific, chemical-specific release, waste and recycling data to EPA on a calendar year basis. For example, in calendar year 2003, 23,957 facilities filed 97,251 TRI reports. FY 2007 results will not be available until FY 2009 due to a two year data lag.

**Methods, Assumptions, and Suitability:** TRI data are collected as required by sections 313 of EPCRA and 6607 of Pollution Prevention Act (PPA) (40 CFR § 372; [www.epa.gov/tri/](http://www.epa.gov/tri/)). Only certain facilities in specific Standard Industrial Classification (SIC) codes are required to report annually the quantities of over 650 listed toxic chemicals and chemical categories released to each environmental medium and otherwise managed as waste (40 CFR § 372; [www.epa.gov/tri/](http://www.epa.gov/tri/)). Regulation requires covered facilities to use monitoring, mass balance, emission factors and/or engineering calculations approaches to estimate releases and recycling volumes. For the Clean and Green Index measures and priority list chemicals measure, data controls are employed to facilitate cross-year comparisons: a subset of chemicals and sectors are assessed that are consistently reported in all years; data are normalized to control for changes in production using published U.S. Bureau of Economic Analysis (BEA) gross product indices (chain-type quantity index for the manufacturing sector). (Please note the federal facility measure data are not normalized to control for changes in production.)

**QA/QC Procedures:** Most facilities use EPA-certified automated Toxics Release Inventory (TRI) FORM R reporting tools, which contain automated error checking mechanisms. Upon receipt of the facilities' reports, EPA conducts automated edits, error checks, data scrubs, corrections and normalization during data entry and subsequent processing to verify that the information provided by the facilities is correctly entered in TRIM. The Agency does not control the quality of the data submitted by the regulated community. EPA does, however, work with the regulated community to improve the quality of their estimates.

**Data Quality Review:** The quality of the data contained in the TRI chemical reports is dependent upon the quality of the data that the reporting facility uses to estimate its releases and other waste management quantities. Use of TRI Form R by submitters and EPA's performance data reviews combine to help assure data quality.

**Data Limitations:** Use of the data should be based on the user's understanding that the Agency does not have direct assurance of the accuracy of the facilities' measurement and reporting processes. TRI release data are reported by facilities on a good faith, best-estimate basis. EPA does not have the resources to conduct on-site validation of each facility's reporting data, though on-site investigations do occur each year at a subset of reporting facilities.

**Error Estimate:** From the various data quality efforts, EPA has learned of several reporting issues such as incorrect assignment of threshold activities and incorrect assignment of release and other waste management quantities (EPA-745-F-93-001; EPA-745-R-98-012; [www.epa.gov/tri/tridata/data\\_quality\\_reports/index.htm](http://www.epa.gov/tri/tridata/data_quality_reports/index.htm); [www.epa.gov/tri/report/index.htm](http://www.epa.gov/tri/report/index.htm).) For example, certain facilities incorrectly assigned a 'processing' (25,000 lb) threshold instead of an 'otherwise use' (10,000 lb) threshold for certain persistent, bioaccumulative and toxic (PBT) chemicals, so they did not have to report if their releases were below 25,000 lbs. Also, for example, some facilities incorrectly reported fugitive releases instead of stack releases of certain toxic chemicals.

**New/Improved Data or Systems:** To improve reporting efficiency and effectiveness, reduce burden, and promote data reliability and consistency across Agency programs, EPA simplified the Toxics Release Inventory (TRI) reporting requirements. The TRI Form Modification Rule effective September of 2005, will simplify data elements, reduced the number of reporting codes, and make two technical corrections to the regulations by correcting contact information and removing an outdated description of a pollution prevention data element. The revised TRI form will allow the EPA to better target pollution prevention efforts, improve public access to information about source reduction and pollution control activities undertaken by some facilities,

and encourage manufacturers to comply by making it easier to use. Please see the following for additional information on this rule: <http://www.epa.gov/tri/tridata/modrule/index.htm>

**References:** [www.epa.gov/tri/](http://www.epa.gov/tri/) and additional citations provided above: EPA-745-F-93-001; EPA-745-R-98-012; <http://www.epa.gov/tri/report/index.htm>; [www.epa.gov/tri/tridata/data\\_quality\\_reports/index.htm](http://www.epa.gov/tri/tridata/data_quality_reports/index.htm); OSWER priority chemicals and fact sheets <http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm>; [www.epa.gov/tri/report/index.htm](http://www.epa.gov/tri/report/index.htm); Bureau of Economic Analysis (BEA) indices are available at <http://www.bea.gov/bea/regional/gsp/>.

**FY 2006 Performance Measures: Reduction in overall pounds of pollution.**

The Agency's Pollution Prevention programs, or results centers, include Green Chemistry, Design for the Environment, Green Engineering, Regional Offices, Pollution Prevention Resource Exchange (P2Rx), Environmentally Preferable Purchasing, Hospitals for a Healthy Environment, and Green Suppliers Network. Each of these programs/results centers operates under the principles of the Pollution Prevention Act and works with others to reduce waste at the source, before it is generated. The programs/results centers are designed to facilitate the incorporation of pollution prevention concepts and principles into the daily operations of government agencies, businesses, manufacturers, nonprofit organizations, and individuals. Each program/results center contributes outcome results which are added to the combined flow of results. Data is rolled up into a single tracking tool: "P2 Program 2011 Strategic Targets - Contributions by Program.xls," which aggregates annual progress toward the goals.

**Performance Database:** *Green Chemistry (GC):* EPA has developed an electronic database ("metrics" database) that allows organized storage and retrieval of green chemistry data submitted to EPA on alternative feedstocks, processes, and safer chemicals. The database was designed to store and retrieve, in a systematic fashion, information on the environmental benefits and, where available, economic benefits that these alternative green chemistry technologies offer. The database was also designed to track the quantity of hazardous chemicals and solvents eliminated through implementation of these alternative technologies. Green Chemistry technology nominations are received up to December 31 of the year preceding the reporting year, and it normally takes 6-12 months to enter new technologies into the database. The database currently has information on all technologies received through 2006.

*Design for the Environment (DfE):* DfE has an evaluation spreadsheet that is populated for all its programs (i.e., Alternatives to Lead Solder in Electronics, Furniture Flame Retardant Alternatives, the Formulator Program, and a collaboration with the Air Office on DfE approaches as implementation mechanisms for regulating Local Area Sources, such as Auto Refinishing). Spreadsheet content varies by project, and generally includes measures comparing baseline technologies or products to safer ones, as well as information on partner adoption and/or market share of safer alternatives. For example, the DfE Formulator Program tracks the move to safer chemicals (such as pounds of chemicals of concern no longer used by partners, and conversely pounds of safer ingredients) and reductions in water and energy use.

*Green Engineering (GE):* GE will be developing an electronic database to keep track of environmental benefits of GE projects including pounds of hazardous chemicals prevented and/or eliminated, gallons of water, British Thermal Units (BTUs) and dollars saved and pounds of carbon dioxide (CO<sub>2</sub>) emissions eliminated.

*Regional Offices:* EPA's Regional Offices' P2 results come primarily through grants they award, and results from projects managed by EPA Regional staff. Regional Offices use the GranTrack database to collect and organize information on the P2 and Source Reduction grants they award. GranTrack includes multiple information fields covering administrative and financial aspects of the grants as well as results reported by grantees. The database can be searched and reports developed in numerous ways, including by Region, type of grant, year grant awarded, and year of results. Data may be displayed for individual grants or in aggregate covering multiple grants.

*P2Rx :* Many state and local P2 programs are currently collecting data on P2 program activities, outputs, and outcomes to feed into the National Pollution Prevention Results System, which will provide data on pollution prevention environmental outcomes performance measures. Standardized metrics have been developed, with definitions, as well as an ongoing system to gather data on these metrics through the regional P2Rx centers. Over 30 state and state-level P2 organizations have signed Memoranda of Agreements to provide data. As the system is implemented, data collected from the programs will be placed first in regional databases managed by the 8 P2Rx centers and then in a new national database. The system was ready for initial use on a national scale in Spring 2006. Each P2Rx center now hosts a Regional Aggregation Module set up to collect data from each program in their region. Actual data entry is just starting. In order to avoid counting data describing the same results twice in EPA performance measurement systems, data from work funded by EPA grants reported through the EPA GranTrack system will be counted in the Regional Center for Results totals, and not in the P2Rx center totals when that data is also reported to the P2Rx center directly by the grantee. Since state and other results funded by EPA grants will be reported through the Regional Center for Results, as just described, the results reported in EPA performance measurement systems through the P2Rx center will therefore be funded from non-federal sources. As a result, EPA cannot claim full responsibility for these results. Nevertheless, EPA support for P2 research, such as technical assistance and outreach through such mechanisms as publications, training, and information inquiries answered by the 8 P2Rx centers, contributes to national P2 progress even when there is no direct EPA funding for a specific project. To capture this indirect effect of EPA's role, 10 percent of the results reported through the P2Rx center will be counted in EPA performance measurement systems.

*Hospitals for a Healthy Environment (H2E) Program:* The H2E program maintains its own electronic program database. Data is collected voluntarily from Partners on an ongoing and continuous basis. Data is requested on mercury and waste reduction information broken down by types of waste. Information on BTUs, gallons of water, and dollar savings are only requested in award applications.

*Green Suppliers Network (GSN):* GSN utilizes a Customer Relationship Management database (CRM) in partnership with the National Institute of Standards and Technology's Manufacturing Extension Partnership Program (NIST MEP) to collect performance metrics for the program. The CRM was originally configured to collect economic information from companies receiving services through the NIST MEP system. The CRM has been modified to capture the environmental metrics collected during a GSN review at a company, such as the value of environmental impact savings identified, energy conserved (BTU, kWh/year), water conserved (gal/year), water pollution reduced (lbs/year), air emissions reduced (lbs/year), hazardous waste reduced (lbs/year), solid waste reduced (lbs/year), and toxic/hazardous chemical use reduced (lbs/year).

*EPP*: Results for Environmentally Preferable Purchasing (EPP) come from the Federal Electronics Challenge (FEC), the Electronic Product Environmental Assessment Tool (EPEAT), and Green Janitorial Products. FEC uses the FEC Administrative Database for storage and retrieval of baseline and annual reporting information from FEC partners. EPP staff run these reporting data through the Environmental Benefits Calculator to calculate pounds of hazardous and non-hazardous pollution reduced, units of energy conserved, and costs saved (among other benefits) on an annual basis. EPEAT-registered manufacturers provide reporting data via the Green Electronics Council, which collects and organizes EPEAT reporting data. As with FEC, the EPP team runs these reporting data through the Environmental Benefits Calculator to calculate pounds of hazardous and non-hazardous pollution reduced, units of energy conserved, and costs saved (among other benefits) on an annual basis. For Janitorial Products, the EPP team will collect annual reporting data from various EPA contacts for EPA's Environmental Management System (EMS), and then run these data through the Green Cleaning Calculator to calculate pounds of hazardous pollution reduced. FY 2006 data will be collected in January 2007. This collection will be the first time FEC uses an online form to collect program data.

**Data Source:** *Green Chemistry (GC)*: Industry and academia submit nominations annually to the Office of Pollution Prevention and Toxics (OPPT) in response to the Presidential Green Chemistry Challenge Awards. Environmental and economic benefit information is included in the nomination packages. The metrics database pulls this public benefit information from the nominations. The database currently has information on all technologies received through 2006.

*Design for the Environment (DfE)*: The source of DfE's evaluation information varies by the project and the partner industry. For example, in DfE's Formulator Recognition Program, partners provide proprietary information on the production volume of their improved formulations. For other partnerships, data sources typically include technical studies (e.g., Alternatives Assessments and Life-Cycle Assessments) and market/sales/adoption information from sources such as industry associations.

*Green Engineering (GE)*: Data will come from various sources and partners including the regions, academia and industry. For example, for GE projects related to the pharmaceutical industry, data will be directly reported by the project leaders. Some information may also come from profiles of recognized projects taken from technical journals or organizations, such as the American Institute of Chemical Engineers, or directly reported by project leaders on industry projects or joint academia-industry projects.

*Regional Offices*: P2 Grant and Source Reduction grant data are secured from grant applications, grant reports and supplemental forms and entered into the P2 Grant Database, Gran Track.

*P2Rx*: See above.

*H2E*: Because the H2E program is a voluntary program, the information collected is voluntarily submitted by hospital Partners. The H2E program maintains an ICR for the collection of data which allows EPA to collect data from third parties under the Paperwork Reduction Act.

*Green Suppliers Network (GSN)*: Data are collected by the GSN Review Team during a GSN review at the company's facility. This team consists of a "lean" manufacturing expert from the NIST MEP system and an environmental expert usually from the state environmental agency or

its designee. Lean manufacturing is a business model and collection of methods that help eliminate waste while delivering quality products on time and at least cost. NIST MEP has a system of lean experts who assist businesses through the process of becoming more efficient and cost effective. The metrics are recorded in the final report generated for the company's use and also are entered into the CRM database by the NIST MEP center. All MEP centers are grantees to the Department of Commerce and must adhere to DOC's requirements for the collection and handling of data. These requirements are reinforced by the terms of the "Request for Proposals" to which each center (e.g., grantee) responds and which must be followed during a GSN review.

*EPP:* For FEC, the data source is federal partners. For EPEAT, the data source is EPEAT-registered manufacturers of electronic products. For Janitorial Products, the data source is EPA EMS contacts for procuring janitorial products.

**Methods, Assumptions, and Suitability:** *Green Chemistry (GC):* The public information is tracked directly through internal record-keeping systems. No models or assumptions or statistical methods are employed.

*Design for the Environment (DfE):* Each DfE partnership identifies and focuses on a unique set of chemicals and industrial processes. For DfE's Formulator Recognition Program, partner-provided data on production volumes is aggregated to determine the total reductions of hazardous chemicals achieved through the program. For Lead-Free Solder and Furniture Flame Retardants, market data for the production volume of the chemical of concern provides the measure for reduction. DfE's Data Program Tracking Spreadsheet includes the methods and assumptions for each project's measures.

*Green Engineering (GE):* The information will be supplied directly by project leaders and/or academic-industry-region partners. The information will be tracked directly through EPA record keeping systems. GE's Data Program Tracking spreadsheet includes methods and assumptions.

*Regional Offices:* The data will come from state and other P2 grantees and other sources as described above. No models or assumptions or statistical methods are employed by EPA

*P2Rx:* The data will come from state and local P2 programs as described above. No models or assumptions or statistical methods are employed.

*H2E:* The data comes directly from program Partners, specifically hospitals. No models or assumptions or statistical methods are employed.

*Green Suppliers Network (GSN):* Data is entered by the NIST MEP. The data is collected using the standard procedures normally utilized by the environmental agency participating in the GSN review. A standard set of metrics has been defined by the GSN program and is collected at each review. The data are aggregated by NIST MEP headquarters and reported to EPA on a regular basis. These data can also be aggregated by sector. The data are aggregated to maintain confidentiality for all companies participating in the program. No models or statistical methods are employed.

*EPP:* For FEC, various assumptions are used to estimate data (starting in 2006) regarding the number of desktops per employee and the average life cycle of desktops. Also, metric calculations rely on the assumptions that: 1) the EPEAT criteria now qualifying a product for the

“bronze” level (see [www.epeat.net](http://www.epeat.net) for criteria); 2) the weight of recycled desktop components; and 3) the commercial process for electricity will not change between 2006-2011. For EPEAT, similar assumptions are made for the weight of plastic components and the weight of packaging for desktops. In the future, when actual data is used to calculate environmental benefits each year, these assumptions will no longer be necessary. Instead, the only assumptions in effect will be that partners report accurate data and those assumptions needed for the Calculator (to be determined) to translate environmental attributes and activities into environmental benefits. The Environmental Benefits Calculator assists institutional purchasers in measuring the environmental and economic benefits of purchasing environmentally preferable products. For Janitorial Products, the method involves reporting the types of products and work practices used during routine cleaning activities in office buildings. The Green Cleaning Calculator assists in calculating pounds of hazardous pollution reduced.

**QA/QC Procedures:** All Pollution Prevention and Toxics programs operate under the Information Quality Guidelines as found at <http://www.epa.gov/quality/informationguidelines>, last accessed on July 27, 2008 and under the Pollution Prevention and Toxics Quality Management Plan (QMP). The Quality Management Plan is for internal use only.

*Green Chemistry:* Data undergo a technical screening review by the Agency before being uploaded to the database to determine if the data adequately support the environmental benefits described in the Green Chemistry Challenge Awards application. Subsequent to Agency screening, data are reviewed by an external independent panel of technical experts from academia, industry, government, and nongovernmental organizations (NGOs). Their comments on potential benefits are incorporated into the database. The panel is convened by the Green Chemistry Institute of the American Chemical Society, primarily for judging nominations submitted to the Presidential Green Chemistry Challenge Awards Program and selecting winning technologies.

*Design for the Environment (DfE):* Data undergo a technical screening review by DfE before being added to the spreadsheet. DfE determines whether data submitted adequately support the environmental benefits described.

*Green Engineering (GE):* Data will be reviewed by the partners including industry, academia, and the regions. Data will also be reviewed by GE to ensure transparency, reasonableness and accuracy.

*Regional Offices:* Data will undergo technical screening review by EPA Regional and Headquarters staff and their contractor before being placed into GranTrack. Data for projects managed directly by EPA Regional staff will be reviewed by Regional personnel. Additional QA/QC steps to be developed, as appropriate.

*P2Rx:* Data will undergo technical screening review by EPA and other program participants (e.g., Pollution Prevention Resource Exchange (P2Rx) centers) before being placed in the database. Additional QA/QC steps to be developed, as appropriate.

*H2E:* Data undergo technical screening review by the grantee (National Center for Manufacturing Sciences, which administers the program through a subgrant) before being placed in the database. QA/QC plan is a part of the grant requirement.

*Green Suppliers Network (GSN):* Data is collected and verified under NIST MEP's QA/QC plan. Each NIST MEP Center must follow QA/QC requirements as grantees to the Department of

Commerce. Additionally, the environmental data are collected under the specific requirements of the state environmental agency participating in each GSN review. Each state agency utilizes their own QA/QC plan for data collection because they utilize the data for purposes in addition to the GSN program.

*EPP:* Regarding FEC, EPEAT, and Janitorial Products, the calculators of environmental benefits (e.g., the Environmental Benefits Calculator and the Green Cleaning Calculator) underwent internal and external review during their development phases. The Environmental Benefits Calculator is still undergoing an external peer review and will not be finalized until Fall/Winter 2006. Regarding FEC and EPEAT, instructions and guidelines are provided to partners on how to report data. Their reporting forms are reviewed annually by EPA management. For EPEAT, EPEAT-registered manufacturers sign a Memorandum of Understanding in which they warrant the accuracy of the data they provide. For Janitorial Products, contractors sign a contract stating that they are providing janitorial products according to certain specifications. For FEC, EPEAT, and Janitorial Products, data undergo an internal technical review before these data are run through the calculators.

**Data Quality Review:** All Office of Pollution Prevention and Toxics (OPPT) programs operate under EPA's Information Quality Guidelines as found at <http://www.epa.gov/quality/informationguidelines> (last accessed on July 27, 2008) and under the OPPT's Quality Management Plan (QMP).

*Green Chemistry (GC):* Review of industry and academic data as documented in U.S. EPA, Office of Pollution Prevention and Toxics, Green Chemistry Program. Files available at <http://www.epa.gov/opptintr/greenchemistry/> (last accessed on July 27, 2008).

*Design for the Environment (DfE):* Data collected includes those from industry associations and government reports. Source data is compared with industry trends and examined by industry and NGO partners.

*Green Engineering (GE):* Data collected will be reviewed to meet data quality requirements.

*Regional Offices:* The GranTrack metrics and data system incorporate ideas and system features from the National Pollution Prevention Results System, developed with EPA support by such organizations as the Northeast Waste Management Officials Association, Pacific Northwest Pollution Prevention Resource Center, and National Pollution Prevention Roundtable. Data for projects managed directly by EPA Regional staff will be reviewed by Regional personnel.

*P2Rx:* The new metrics and data system were based, in part, on recommendations in the February 2001 GAO report, "EPA Should Strengthen Its Efforts to Measure and Encourage Pollution Prevention" (GAO-01-283). They also incorporate work by such organizations as the Northeast Waste Management Officials Association, Pacific Northwest Pollution Prevention Resource Center, and National Pollution Prevention Roundtable.

*H2E and Green Suppliers Network (GSN):* Not applicable.

*EPP:* For FEC, data are entered on-line with an additional error-checking function on the online form. The mechanism by which the EPP program is receiving data from the Green Electronics Council is still being determined. For Janitorial Products, data quality review steps (as of 4th quarter 2006) are still under development.

**Data Limitations:** *Green Chemistry (GC):* Occasionally data are not available for a given technology due to confidential business information (the Presidential Green Chemistry Challenge Awards Program does not process CBI). Because the Presidential Green Chemistry Challenge is a voluntary public program, it cannot routinely accept or process CBI. If the program stakeholders cannot verify a technology because of proprietary information, especially during the final judging stage of the awards program, they can and do ask EPA to conduct the verification internally. EPA will then ask the company to share confidential information with CBI-cleared OPPT staff in order for EPA to conduct the verification. It also is occasionally unclear as to what is the percentage market penetration of implemented alternative green chemistry technology (potential benefits vs. realized benefits). In these cases, the database is so noted.

*Design for the Environment (DfE):* Occasionally, data on innovative chemistries or technologies are claimed CBI by the developing company, thus limiting the implementation of beneficial pollution prevention practices on a wider scale.

*Green Engineering (GE):* There may be instances in which environment benefits are not clearly quantified and/or available due to various reasons including CBI. In those instances, the data have to be carefully evaluated and considered for reporting. If the information is included, the uncertainties/limitations will be noted.

*Regional Offices:* Limitations arise from the reliance on individual state and other P2 grantees and other sources to gather data. These programs vary in attention to data collection from sources within their jurisdictions, data verification and other QA/QC procedures. Also, despite changes described below to add consistent metrics and definitions, some differences exist. EPA is attempting to address these concerns by strengthening reporting requirements in its P2 grants, focusing on outcomes, and standardizing GranTrack metrics with those in the National P2 Results System. EPA is also in the process of adding a P2 component to the EPA Information Exchange Network (which provides financial support and a comprehensive data system to link state data with EPA).

*P2Rx:* Limitations arise from the reliance on individual state and local P2 programs to gather data. These programs vary in attention to data collection from sources within their jurisdictions, data verification and other QA/QC procedures. Also, despite development of core measures and a data dictionary, differences in reporting exist among data sources. EPA is attempting to address these concerns by working with the groups described above who have been partners in the development of the National Pollution Prevention Results System. EPA is also in the process of adding a P2 component to EPA Information Exchange Network.

*H2E:* Not all hospital Partners have turned in their facility assessment information. However, in order to be considered for an award under the program, hospital Partner MUST submit facility information; therefore, the program has a very complete set of information for hospital Partners who have applied for awards. This introduces self-selection bias to the reported data as the hospitals with the best track records are those that apply for the awards. The program has roughly 10 percent of all Partner facilities' assessment data. An internal assessment conducted of data collected from Partners revealed some calculation errors and data inconsistencies regarding how waste data is captured by the hospital Partners. The program has gone back to correct some of those errors.

*Green Suppliers Network (GSN):* Limitations arise from the reliance on individual programs to gather data. These programs vary in attention to data collection from sources within their

jurisdictions, data verification and other QA/QC procedures. The GSN program has attempted to address these concerns by strengthening the data collection requirements in the Request for Proposals that MEP centers must respond to in order to perform a GSN review.

*EPP:* FEC and EPEAT have a built-in reliance on partners for data reporting.

**Error Estimate:** *Green Engineering (GE):* There may be instances in which environmental benefits are not clearly quantified. In those instances, the data will be excluded.

*Design for the Environment (DfE):* The program simply compiles data and does not conduct statistical analysis. Error estimates are not available.

*H2E:* The program does not use a statistical approach to collect the data and therefore does not have confidence intervals for the performance estimates.

*Green Suppliers Network (GSN):* Not applicable.

*EPP:* Any errors detected during internal technical review of performance data submitted would be addressed, either through correction of data or elimination of data.

**New/Improved Data or Systems:** *Regional Offices:* EPA recently updated and expanded GranTrack, both to improve usability and to add a much greater level of detail regarding results reported by grantees. In regard to reporting of results, GranTrack includes activity measures, behavioral measures, and outcome measures. The metrics chosen and their definitions generally are consistent with those used in the National Pollution Prevention Results System, described in the P2Rx center. Also, EPA is planning to grant the public restricted access to GranTrack. The following fields will be accessible: general information, projects and results data, status of grant, funding, keywords, partners, and sectors.

*P2Rx:* This center's data collection system is currently under initial implementation through the partnership described above.

*H2E:* The program is currently beta-testing new facility assessment software which will help hospital Partners collect and compute facility environmental improvement data. The software automatically converts units and tabulates information from the hospital's source data, as well as calculating costs for different waste streams. Anticipated roll-out for the software will be in 2007.

*EPP:* FEC will use additional on-line data entry forms in 2007.

**References:** Green Chemistry (GC): <http://www.epa.gov/opptintr/greenchemistry/> (accessed July 27, 2006); Design for the Environment (DfE): <http://www.epa.gov/opptintr/dfe/> (accessed July 27, 2006); Green Engineering (GE): <http://www.epa.gov/opptintr/greenengineering/> (accessed July 27, 2006); Pollution Prevention (P2) Programs: <http://www.epa.gov/oppt/p2home/index.htm> (accessed July 27, 2006); <http://www.p2.org/workgroup/Background.cfm> (accessed July 27, 2006); <http://www.epa.gov/Networkg/> (accessed July 27, 2006); Hospitals for a Healthy Environment (H2E): <http://www.epa.gov/oppt/pollutionprevention/pubs/h2e.htm> (accessed July 27, 2006); Green Suppliers Network (GSN): [www.greensuppliers.gov](http://www.greensuppliers.gov) (accessed July 27, 2006);

*EPP:* Information about FEC's annual reporting is on the FEC web site at:

<http://www.federalectronicchallenge.net/report.htm> (accessed July 27, 2006); Information about the Environmental Benefit Calculator is on the FEC web: <http://www.federalectronicchallenge.net/resources/docs/enbencalc.pdf> (accessed July 27, 2006); The EPEAT Subscriber and License Agreement is available on the EPEAT web site at: <http://www.epeat.net/docs/Agreement.pdf> (accessed July 27, 2006).

**FY 2006 Performance Measure: Specific reductions in six media/resource areas: water use, energy use, solid waste, air releases, water discharges, & material use.**

**Performance Databases:** Both the Performance Track On-Line (a Domino database) and the Performance Track Members Database (a Microsoft Access database) store information that facilities have provided to EPA in applications and annual performance reports. Performance Track members select a set of environmental indicators on which to report performance over a three-year period of participation. The externally reported indicators (listed above) may or may not be included in any particular facility's set of indicators. Performance Track aggregates and reports only that information that a facility voluntarily reports to the Agency. A facility may make progress towards one of the above indicators, but if it is not among its set of "commitments", then Performance Track's data will not reflect the changes occurring at the facility. Similarly, if a facility's performance declines in any of the above areas and the indicator is not included among its set of commitments, that decline will not be reflected in the above results.

Members report on results in a calendar year. Fiscal year 2007 corresponds most closely with members' calendar year 2006. That data will be reported to the Performance Track program by April 1, 2007. The data will then be reviewed, aggregated, and available for external reporting in September 2007. (Calendar year 2005 data will become available in September 2006.)

**Data Source:** All data are self-reported and self-certified by member facilities. As described below, Performance Track engages in quality control to the extent possible, but it does not conduct formal auditing. However, a criterion of Performance Track membership is the existence of an environmental management system (EMS) at the facility, a key element of which is a system of measurement and monitoring. Most Performance Track facilities have had independent third-party audits of their EMSs, which create a basis for confidence in the facilities' data. It is clear from submitted reports that some facilities have a tendency to estimate or round data. Errors are also made in converting units and in calculations. In general, however, EPA is confident that the externally reported results are a fair representation of members' performance.

**Methods, Assumptions, and Suitability:** Data collected from members' applications and annual performance reports are compiled and aggregated across those members that choose to report on the given indicator. The data reflect the performance results at the facility; any improvements or declines in performance are due to activities and conditions at the specific facility as a whole. However, in some cases, facilities report results for specific sections of a facility and this may not be clear in the reports submitted to the program. For example, Member A commits to reducing its VOCs from 1000 tons to 500 tons over a 3-year period. In Year 1, it reports a reduction of VOCs from 1000 tons to 800 tons. Performance Track aggregates this reduction of 200 tons with results from other facilities. But unbeknownst to Performance Track, the facility made a commitment to reduce its VOCs from Production Line A and is only reporting on its results from that production line. The facility is not intentionally hiding information from EPA, but mistakenly thought that its commitment could focus on environmental management activities at Production Line A rather than across the entire facility. Unfortunately, due to increased production and a couple of mishaps by a sloppy technician, VOC emissions at

Production Line B increased by 500 tons in Year 1. Thus, the facility's VOC emissions actually increased by 300 tons in Year 1. Performance Track's statement to the public that the facility reduced its emissions by 200 tons is therefore misleading.

The data can be used to make year-to-year comparisons, but reviewers and analysts should bear in mind that Performance Track membership is constantly in flux. Although members should retain the same set of indicators for their three-year participation period, as new members join the program and others leave, the baseline constantly changes.

Due to unavoidable issues regarding the timing of the application period, a small subset of reported data will represent two years of performance at certain facilities, i.e., the baseline will be two years prior rather than one year.

**QA/QC Procedures:** Data submitted with applications and annual performance reports to the program are reviewed for completeness and adherence to program formatting requirements. In cases where it appears possible that data is miscalculated or misreported, EPA or contractor staff follows up with the facility. If the accuracy of data remains under question or if a facility has provided incomplete or non-standard data, the database is coded to ensure that the data is excluded from aggregated and externally reported results.

Additionally, Performance Track staff visit up to 20 percent of Performance Track member facilities each year. During those visits, facilities are asked about their data collection systems and about the sources of the data reported to the program.

Performance Track contractors conduct a quality review of data entered manually into the database. Performance Track staff conduct periodic checks of the entered data.

As described, Performance Track is quality controlled to the extent possible, but is not audited in a formal way. However, a prerequisite of Performance Track membership is an environmental management system (EMS) at the facility, a key element of which is a system of measurement and monitoring. Most Performance Track facilities have had independent third-party audits of their EMSs, which create a basis for confidence in the facilities' data.

A Quality Management Plan is under development.

**Data Limitations:** Potential sources of error include miscalculations, faulty data collection, misreporting, inconsistent reporting, and nonstandard reporting on the part of the facility. Where facilities submit data outside of the Performance Track On-Line system, Performance Track staff or contractors must enter data manually into the database. Manually entered data is sometimes typed incorrectly.

It is clear from submitted reports that some facilities have a tendency to estimate or round data. Errors are also made in converting units and in calculations. In general, however, EPA is confident that the externally reported results are a fair representation of members' performance.

**New/Improved Performance Data or Systems:** Since spring 2004, all Performance Track applications and annual performance reports have been submitted electronically (i.e., through the Performance Track On-Line system), thus avoiding the need for manual data entry. Additionally, the program is implementing a new requirement that all members gain third-party assessments of their EMSs. Also, the program has reduced the chances that data may reflect

process-specific (rather than facility-wide) data by paying additional attention to the issue in the review process and by instituting “facility-wide data” requirements for all indicators.

**References:** Members’ applications and annual performance reports can be found on the Performance Track website at <https://yosemite.epa.gov/opei/ptrack.nsf/faMembers?readform>. *Performance Track On-Line* and the *Performance Track Members Database* are not generally accessible. Performance Track staff can grant access to and review of the databases by request.

### **GOAL 5 OBJECTIVE 3**

#### **FY 2006 Performance Measures:**

- **Percent of tribes with delegated and non-delegated programs. (PART measure)**
- **Percent of tribes with EPA-reviewed monitoring and assessment occurring. (PART measure)**
- **Percent of tribes with EPA-approved multimedia work plans. (PART measure)**
- **Number of environmental programs implemented in Indian country per million dollars. (PART efficiency measure)**
- **Increase Tribe’s ability to develop environmental program capacity by ensuring that federally recognized tribes have access to an environmental presence.**
- **Develop or integrate EPA and interagency data systems to facilitate the use of EPA’s Tribal Program Enterprise Architecture (TPEA) information in setting environmental priorities.**
- **Eliminate data gaps for environmental conditions for major water, land and air environmental programs as determined through the availability of information in the EPA TPEA.**
- **Increase implementation of environmental programs in Indian country as determined by program delegations, approvals, or primacies issued to tribes and direct implementation activities by EPA.**
- **Increase percent of EPA agreements with Tribes that reflect holistic (multimedia) program integration and traditional uses of natural resources.**
- **Increase the number of EPA-approved quality assurance plans for tribal environmental monitoring and assessment activities (Baseline 243).**

**Performance Database:** EPA’s American Indian Environmental Office (AIEO) developed an information technology infrastructure, named the Tribal Program Enterprise Architecture (TPEA). The TPEA is a suite of ten secure Internet-based applications that track environmental conditions and program implementation in Indian country as well as other AIEO business functions. One TPEA application, the Objective 5.3 Reporting System, tracks progress in achieving the performance targets under Goal 5 Objective 3 of EPA’s National Strategic Plan – “Build Tribal Capacity.” EPA staff use the Objective 5.3 Reporting System to establish program performance commitments for future fiscal years, to record actual program performance for overall national program management. Therefore, the Objective 5.3 Reporting System serves as the performance database for all of the annual performance measures.

**Data Source:** The performance measure, “Percent of tribes with delegated and non-delegated programs,” tracks the number of: Treatment in a manner similar to a State (TAS) approvals or primacies; implementations of a tribal program; executions of Direct Implementation Tribal Cooperative Agreements (DITCA); and GAP (General Assistance Programs) grants that have provisions for the implementation of solid waste or hazardous waste programs.

EPA Regional project officers managing Tribes with delegated and non-delegated environmental programs input data, classified by tribe, into the Objective 5.3 Reporting System to derive a national cumulative total.

The performance measure, “Percent of Tribes with EPA approved multi-media workplans,” tracks the number of: Performance Partnership Grants (PPGs); Tribal Environmental Agreements (TEAs), Tier I, Tier II, and Tier III; Memoranda of Agreement (MOAs); and Memoranda of Understanding (MOUs).

EPA Regional tribal program liaisons input data, which are summed annually. It is possible a tribe will contribute to the measure in more than one way.

The performance measure, “Percent of tribes with EPA-reviewed monitoring and assessment occurring (cumulative),” reports the number of active Quality Assurance Project Plans (QAPPs). All ongoing environmental monitoring programs are required to have active QAPPs. Regional tribal program liaisons obtain the information from Regional Quality Assurance Officers and input it into the Objective 5.3 Reporting System. The data are updated continuously and summed at the end of the fiscal year.

The performance measure, “Number of environmental programs implemented in Indian Country per million dollars,” is calculated annually by summing the number of tribes receiving GAP grants, the number of TAS approvals or primacies, the number of DITCAs, and the number of GAP grants that have provisions for the implementation of solid or hazardous waste programs and dividing that sum by the annual GAP appropriation (less rescissions and annual set-asides).

**Methods, Assumptions and Suitability:** The Objective 5.3 Reporting System contains all the information for reporting on performance. The measure that tracks delegated and non-delegated programs can be cross-referenced and verified with records from the Integrated Grants Management System. The measure that tracks monitoring and assessment programs can be verified from databases maintained by the Regional Quality Assurance Officers. The measure that tracks multimedia work plans can be verified from official correspondence files between EPA Regions and Tribes, or from project officer case files.

**QA/QC Procedures:** Data used in the Tribal Program Enterprise Architecture contains quality assurance and metadata documentation prepared by the originating agency or program. Because the information in the Tribal Program Enterprise Architecture is used for budget and strategic planning purposes, AIEO requires adherence to the Agency’s Information Quality Guidelines. <<http://www.epa.gov/quality/informationguidelines/>>

**Data Quality Reviews:** Data correction and improvement is an ongoing component of the Tribal Program Enterprise Architecture. The Objective 5.3 Reporting System relies on multiple staff-level reviews. In addition, a special application, the Tribal Information Management System (TIMS) Data Center was developed to support the submission of corrections to boundary information, narrative tribal profiles, and factual database information – particularly latitude and longitude coordinates for facilities. The AIEO collects and passes along recommendations regarding the correction or modification of databases whenever errors are detected or suggestions for database improvement are received. Each database manager retains the responsibility of addressing the recommended change according to quality assurance protocols. Because the data submittals are used for budget or strategic planning purposes, AIEO requires

that all submittals comply with the Agency's Information Quality Guidelines.  
<<http://www.epa.gov/quality/informationguidelines/>>

**Data Limitations:** A large part of the data used by the Tribal Program Enterprise Architecture has not been coded to particular Tribes by the recording agency. AIEO uses new geographic data mining technologies to extract records based on the geographical coordinates of the data points. For example, if a regulated facility has latitude and longitude coordinates that place it in the boundaries of the Wind River Reservation, then it is assigned to the Arapaho and Shoshone Tribes of the Wind River Reservation. This technique is extremely powerful because it tribally enables large numbers of information systems which were previously incapable of identifying Tribes. This approach will be applied to all EPA databases. There are limitations, however. When database records are not geographically identified with latitude and longitude, the technique does not work and the record is lost to the system. For EPA regulated facilities in the Facility Registry System, AIEO estimates that 64 percent have latitude and longitude recorded. Therefore, the accuracy of EPA's data concerning environmental conditions in Indian country will depend on additional improvements to Agency data systems.

**Error Estimate:** Analysis of variation of reservation boundary coverages available to EPA indicates deviations of up to 5 percent. Another source of error is that some records are not sufficiently described geographically to be assigned to specific Tribes. It is estimated that 36 percent of the regulated facilities in EPA's regulatory databases are not geographically described. The TPEA identifies the non-geographically indexed facilities by postal zip code for zip codes that overlap tribal boundaries.

**New/Improved Data or Systems:** The technologies used by the Tribal Program Enterprise Architecture are new, secure and state-of-the-art. The geographic interface is a product called ARC/IMS, which is a web-based application, with a fully functional scalable Geographic Information System (GIS). The Tribal Program Enterprise Architecture uses XML protocols to attach to and display information seamlessly and in real-time from cooperating agency data systems without having to download the data to an intermediate server. In addition, the TPEA project has developed web-based, secure data input systems that allow Regional project officers and tribal program liaisons to input programmatic data directly into performance reporting systems, TIMS and other customizable reports.

**References:** [https://oasint.rtpnc.epa.gov/TATS/tats\\_prv/entry\\_page](https://oasint.rtpnc.epa.gov/TATS/tats_prv/entry_page);  
<http://www.epa.gov/quality/informationguidelines>.

#### **GOAL 5 OBJECTIVE 4**

**FY 2006 Performance Measure: Percent of respondents to survey of vendors of ETV-verified technologies stating that ETV information positively influenced sales and/or vendor innovation.**

**Performance Database:** No, internal tracking system.

**Data Source:** Responses from a census of vendors who have participated in or completed the ETV program between FY 2001 to approximately six months before the survey is administered, or a statistically representative sample of this population. The anticipated completion date for the report from the vendor survey is January 2006. Data will be available for inclusion in the FY 2006 Annual Performance Report.

**Methods, Assumptions and Suitability:** Data collection methodology is anticipated to be a combination of web technology and telephone interviewing; the final mode of delivery will be determined as the project progresses. Data collection is scheduled for May through July 2005. The schedule may need to be adjusted depending upon survey development, testing and the Information Collection Request process. The information is a direct measure of the research outcomes for this program.

**QA/QC Procedures:** EPA anticipates testing instrument validity, with a field test in February 2005, to make sure what was designed to be measured is being measured. As a result, questions which don't elicit information on the constructs of interest will be deleted and others will be added if the constructs are not fully developed/addressed by the initial list of questions. The goal is to reduce the amount of non-random error as much as possible before the survey is administered.

**Data Quality Reviews:** The respondent will enter data using a web questionnaire, minimizing and/or eliminating data entry by contractor personnel. The questionnaire will be designed using well accepted survey development practices and will include background information and instructions designed to maximize the likelihood that the questionnaires will be completed correctly. EPA also anticipates using Advanced Computer Assisted Telephone Interviewing equipment and processes which allow the interviewer to thoroughly check data entry at the time the respondent answers the question. This also should assure a high quality data set.

**New/Improved Data or Systems:** EPA anticipates that future vendor surveys will either be performed "en masse," approximately four to five years apart, or on an ongoing periodic basis, at intervals to be determined based on the results of the 2005 survey.

**References:** Miller, Delbert C. and Neil J. Salkind. Handbook of Research Design and Social Measurement, Sixth Edition. Sage Publications. Thousand Oaks, CA. 2002.

## **ENABLING SUPPORT PROGRAMS**

### **FY 2006 Performance Measures:**

- **Number of major EPA environmental systems that use the CDX electronic requirements enabling faster receipt, processing, and quality checking of data.**
- **Number of states, tribes, and territories that will be able to exchange data with CDX through nodes in real time, using standards and automated data-quality checking.**
- **Number of users from states, tribes, laboratories, and others that choose CDX to report environmental data electronically to EPA.**
- **Customer-help desk calls resolved in a timely fashion.**

**Performance Database:** CDX Customer Registration Subsystem.

**Data Source:** Data are provided by State, private sector, local, and Tribal government CDX users.

**Methods, Assumptions, and Suitability:** All CDX users must register before they can begin reporting. The records of registration provide an up-to-date, accurate count of users. Users identify themselves with several descriptors and use a number of CDX security mechanisms for ensuring the integrity of individuals' identities.

**QA/QC Procedures:** QA/QC have been performed in accordance with a CDX Quality Assurance Plan (*Quality Assurance Project Plan for the Interim Central Data Exchange System*. Document number: EP005T7. Sept. 17, 2001) and the CDX Design Document v.3, Appendix K registration procedures (*Central Data Exchange Electronic Reporting Prototype System Requirements: Version 3*; Document number: EP005S3. December 2000). Specifically, data are reviewed for authenticity and integrity. The CDX Quality Assurance Plan was updated in FY 2004 (*Quality Assurance Project Plan for the Central Data Exchange*, "10/8/2004; contact: Charles Freeman 202-566-1694) to incorporate new technology and policy requirements and will undergo another revision by December 2006. Automated edit checking routines are performed in accordance with program specifications and CDX quality assurance guidance (*Quality Assurance Project Plan for the Interim Central Data Exchange System*. Document number: EP005T7. Sept. 17, 2001).

**Data Quality Reviews:** CDX completed its last independent security risk assessment in January 2005, and all vulnerabilities are being reviewed or addressed. In addition, routine audits of CDX data collection procedures, statistics and customer service operations are provided weekly to CDX management and staff for review. Included in these reports are performance measures such as the number of CDX new users, number of submissions to CDX, number of help desk calls, number of calls resolved, ranking of errors/problems, and actions taken. These reports are reviewed and actions discussed at weekly project meetings.

**Data Limitations:** The CDX system collects, reports, and tracks performance measures on data quality and customer service. While its automated routines are sufficient to screen systemic problems/issues, a more detailed assessment of data errors/problems generally requires a secondary level of analysis that takes time and human resources. In addition, environmental data collected by CDX is delivered to National data systems in the Agency. Upon receipt, the National systems often conduct a more thorough data quality assurance procedure based on more intensive rules that can be continuously changing based on program requirements. As a result, CDX and these National systems appropriately share the responsibility for ensuring environmental data quality.

**Error Estimate:** CDX incorporates a number of features to reduce errors in registration data and that contribute greatly to the quality of environmental data entering the Agency. These features include pre-populating data either from CDX or National systems, conducting web-form edit checks, implementing XML schemas for basic edit checking and providing extended quality assurance checks for selected Exchange Network Data flows using Schematron. The potential error in registration data, under CDX responsibility has been assessed to be less than 1 percent.

**New/Improved Performance Data or Systems:** CDX coalesces the registration/submission requirements of many different data exchanges with EPA and the States, Tribes, local governments and regulated community into a centralized environment. The system allows for a more consistent and comprehensive management and performance tracking of many different external customers. The creation of a centralized registration system, coupled with the use of web forms and web-based approaches to submitting the data, invite opportunities to introduce additional automated quality assurance procedures for the system and reduce human error.

**References:** CDX website ([www.epa.gov/cdx](http://www.epa.gov/cdx)).

**FY 2006 Performance Measure: Percent of Federal Information Security Management Act**

**reportable systems that are certified and accredited.**

**Performance Database:** Automated Security Self-Evaluation and Remediation Tracking (ASSERT) database.

**Data Source:** Information technology (IT) system owners in Agency Program and Regional offices.

**Methods, Assumptions, and Suitability:** Annual IT security assessments are conducted using the methodology mandated by the Office of Management and Budget (OMB), the National Institute of Standards, and Technology (NIST) Security Self-Assessment Guide for Information Technology Systems. ASSERT has automated and web-enabled this methodology.

**QA/QC Procedures:** Automated edit checking routines are performed in accordance with ASSERT design specifications to ensure answers to questions in ASSERT are consistent. The Office of Inspector General consistent with §3545 FISMA, and the Chief Information Officer's information security staff conduct independent evaluations of the assessments. The Agency certifies results to OMB in the annual FISMA report.

**Data Quality Reviews:** Program offices are required to develop security action plans composed of tasks and milestones to address security weaknesses. Program offices self-report progress toward these milestones. EPA's information security staff review these self-reported data, conduct independent validation of a sample, and discuss anomalies with the submitting office.

**Data Limitations:** Resources constrain the security staff's ability to validate all of the self-reported compliance data submitted by program systems' managers.

**References:** Annual Information Security Reports to OMB: <http://intranet.epa.gov/itsecurity/progreviews/>; OMB guidance memorandum: <http://www.whitehouse.gov/omb/memoranda/2003.html>; ASSERT web site: <https://cfint.rtpnc.epa.gov/assert/>; NIST Special Publication 800-26, *Security Self Assessment Guide for Information Technology Systems*, November 2001: <http://csrc.nist.gov/publications/nistpubs/index.html>; and, Federal Information Security Management Act, PL107-347: [http://csrc.nist.gov/policies/FISMA\\_final.pdf](http://csrc.nist.gov/policies/FISMA_final.pdf)

**FY 2006 Performance Measure: Cumulative percentage reduction in energy consumption in EPA's 21 laboratories from the 2003 base.**

**Performance Database:** The Agency's contractor provides energy consumption information quarterly and annually. The Agency keeps the energy consumption data in the "Energy Reporting System." The contractor is responsible for validating the data.

**Data Source:** The Agency's contractor collects quarterly energy data from each of EPA's laboratories. The data are based on metered readings from the laboratory's utility bills for certain utilities (natural gas, electricity, purchased steam, chilled water, high temperature hot water, and potable water) and from on-site consumption logs for other utilities (propane and fuel oil). The data from the on-site consumption logs are compared to invoices to verify that reported consumption and cost data are correct.

**QA/QC Procedures:** EPA's Sustainable Facilities Practices Branch compares reported energy use at each facility against previous years' data to see if there are any significant and unexplainable increases or decreases in energy quantities and costs.

**Data Limitations:** EPA does not have a formal meter verification program to ensure that an on-site utility meter reading corresponds to the charges included in the utility bill.

**FY 2006 Performance Measures:**

- **Environmental and business actions taken for improved performance or risk reduction; environmental and business recommendations or risks identified for corrective action; and return on the annual dollar investment, as a percentage of the OIG budget, from audits and investigations.**
- **Criminal, civil, administrative, and fraud prevention actions.**

**Performance Database:** The OIG Performance Measurement and Results System captures and aggregates information on an array of measures in a logic model format, linking immediate outputs with long-term intermediate outcomes and results. OIG performance measures are designed to demonstrate value added by promoting economy, efficiency and effectiveness; and preventing and detecting fraud, waste, and abuse as described by the Inspector General Act of 1978 (as amended). Because intermediate and long-term results may not be realized for several years, only verifiable results are reported in the year completed. Database measures include numbers of: 1) recommendations for environmental and management improvement; 2) legislative, regulatory policy, directive, or process changes; 3) environmental, program management, security and resource integrity risks identified, reduced, or eliminated; 4) best practices identified and implemented; 5) examples of environmental and management improvements made; 6) monetary value of funds questioned, saved, fined, or recovered; 7) criminal, civil, and administrative actions taken, 8) public or congressional inquiries resolved; and 9) certifications, allegations disproved, and cost corrections.

**Data Source:** Designated OIG staff enter data into the system. Data are from OIG performance evaluations, audits, research, court records, EPA documents, data systems, and reports that track environmental and management actions or improvements made and risks reduced or avoided. OIG also collects independent data from EPA's partners and stakeholders.

**Methods, Assumptions, and Suitability:** OIG performance results are a chain of linked events, starting with OIG outputs (e.g., recommendations, reports of best practices, and identification of risks). The subsequent actions taken by EPA or its stakeholders/partners, as a result of OIG's outputs, to improve operational efficiency and environmental program delivery are reported as intermediate outcomes. The resulting improvements in operational efficiency, risks reduced/eliminated, and conditions of environmental and human health are reported as outcomes. By using common categories of performance measures, quantitative results can be summed and reported. Each outcome is also qualitatively described, supported, and linked to an OIG product or output. The OIG can only control its outputs, and has no authority, beyond its influence, to implement its recommendations that lead to environmental and management outcomes.

**QA/QC Procedures:** All performance data submitted to the database require at least one verifiable source assuring data accuracy and reliability. Data quality assurance and control are performed as an extension of OIG products and services, subject to rigorous compliance with

the Government Auditing Standards of the Comptroller General<sup>25</sup>, and regularly reviewed by OIG management, an independent OIG Quality Assessment Review Team, and external independent peer reviews. Each Assistant Inspector General certifies the completeness and accuracy of their performance data.

**Data Quality Reviews:** There have not been any previous audit findings or reports by external groups on data or database weaknesses in the OIG Performance Measurement and Results System. All data reported are audited internally for accuracy and consistency.

**Data Limitations:** All OIG staff are responsible for data accuracy in their products and services. However, there is a possibility of incomplete, miscoded, or missing data in the system due to human error or time lags. Data supporting achievement of results are often from indirect or external sources, with their own methods or standards for data verification/validation.

**Error Estimate:** The error rate for outputs is estimated at +/-2 percent, while the error rate for reported long-term outcomes is presumably greater because of the longer period needed for tracking results and difficulty in verifying a nexus between our work and subsequent actions and impacts beyond our control. Errors tend to be those of omission.

**New/Improved Data or Systems:** The OIG developed the Performance Measurement and Results System as a prototype in FY 2001 and constantly revises the clarity and quality of the measures as well as system improvements for ease of use. During FY 2006, we gave staff briefings on the application of OIG measures and the OIG Performance Measurement and Results System. We expect the quality of the data to continue improving as staff gain greater familiarity with the system and measures, and we will enhance this system by linking it to a follow-up process to better track actions and impacts from OIG recommendations. We also anticipate creating linkages to customer satisfaction results and resource investments, to provide a full-balanced scorecard with return on investment information for accountability and decision making.

**References:** All OIG non-restricted performance results are referenced in the OIG Performance Measurement and Results System with supporting documentation available either through the OIG Web Site or other Agency databases. The OIG Web Site is [www.epa.gov/oig](http://www.epa.gov/oig).<sup>26</sup>

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<sup>25</sup>Government Auditing Standards (2003 Revision), General Accounting Office, GAO-03-673G, June 2003; Available on the Internet at [www.gao.gov/govaud/ybk01.htm](http://www.gao.gov/govaud/ybk01.htm), last updated July 13, 2006

<sup>26</sup> U.S. EPA, Office of Inspector General, Audits, Evaluations, and Other Publications, Available on the Internet at [www.epa.gov/oig](http://www.epa.gov/oig) , last updated August 2, 2006