Strategic Measure for Water Quality in Urban Watersheds: Update

Outcome Goal

Protect water quality by reducing levels of pesticides of concern.

Strategic Target

By 2011, reduce the percentage of urban watersheds sampled by the US Geological Survey's National Water Quality Assessment (USGS NAWQA) program that exceeds the National Pesticide Program aquatic life benchmarks for three key pesticides of concern (diazinon, chlorpyrifos, malathion).

Background

The reductions are specified by chemical and expressed as a percentage of urban streams sampled nationally that exceed the OPP aquatic life benchmarks at any time during the evaluation period. This is in recognition of the fact that resources available to support monitoring can change from year to year. Targets for 2009 and 2010 are not included in the official measure, but are incremental targets. The 2008 target is the first year of reporting.

Key pesticide	Baseline (2006)	2008 target	2009 target	2010 target	2011 target
Diazinon	40%	25%	20%	15%	5%
Chlorpyrifos	37%	25%	20%	15%	10%
Malathion	30%	30%	25%	20%	15%

The Baseline

The baseline is derived from the USGS National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001. NAWQA identified land-use classification of the watersheds of the streams sampled as predominately agricultural, urban, undeveloped, or mixed. Of all streams sampled, 30 were identified as having a predominantly urban signature. Concentrations measured in these 30 streams formed the baseline for this national urban water quality measure.

The following are the baselines for the 3 key pesticides of concern. The percentages represent the streams where measured concentrations exceeded at least one aquatic life benchmark at any time during the evaluation period (1992-2001).

Diazinon Baseline: 40% of 30 urban watersheds sampled exceeded aquatic life benchmarks. OPP's 2011 target would result in 95 % of urban streams nationally that do not exceed any diazinon aquatic life benchmark.

Chlorpyrifos Baseline: 37% of 30 urban watersheds sampled exceeded aquatic life benchmarks. OPP's 2011 target would result in 90 % of urban streams nationally that do not exceed any chlorpyrifos aquatic life benchmark.

Malathion Baseline: 30% of 30 urban watersheds sampled exceeded aquatic life benchmarks. OPP's 2011 target would result in 85 % of urban streams nationally that do not exceed any malathion aquatic life benchmark

2008 Annual Actual Performance Outcomes Measured

In 2008, USGS NAWQA provided OPP with an update of monitoring data for the 30 urban sites that were reported in the 2006 report from which the baseline was derived. Of the original 30 sites, a sub-set of 20 sites had been monitored for the pesticides of concern during 2001-2004. The monitoring dataset used to evaluate the environmental outcomes is USGS NAWQA data for 2001-2004. Concentrations of the pesticides of concern (individual concentrations not time-weighted averages) were compared to OPP aquatic life benchmarks. The percentages in the following table represent movement toward the goal to reduce the percentage of urban streams exceeding aquatic benchmark from the percentage with exceedances when the measure was put into place in 2006.

Key pesticide	**Baseline (2006)**	**2008 target**	**2008 actual**	**% difference from target**
Diazinon	40%	25%	40%	+15%
Chlorpyrifos	37%	25%	0%	-25%
Malathion	30%	30%	30%	0 %

Diazinon: 40% (8 sites of 20) urban watersheds sampled nationally from 2001-2004 exceeded a diazinon aquatic life benchmark. There were 15% more sites with exceedances than OPP's 2008 target in this time period. This is a deviation from the target performance of 25% of urban watersheds exceeding an aquatic life benchmark. This may be due in part to the time line associated with the phase-out agreement of diazinon urban uses. The terms of the four-year phase-out stipulated that technical registrants reduce the amount of diazinon produced by 50% or more by 2003. As of December 31, 2004, it was unlawful to sell diazinon outdoor, non-agricultural products in the United States (the "stop sale" date for all outdoor diazinon home, lawn, and garden products). According to existing stocks provisions, it remained legal for consumers to use products bearing labeling that allowed these uses after that date. The four-year process for phasing out diazinon urban uses overlapped completely with this monitoring cycle (2001-2004) and may account for the deviation from the 2008 performance goal.

The location of streams with exceedances and the number of exceedances is noted below.
Las Vegas, NV (1 exceedance)
Baton Rouge, LA (1 exceedance)
Annandale, VA (1 exceedance)
Niskayuna, NY (1 exceedance)
Denver, CO (2 exceedances)
Memphis, TN (9 exceedances)
Del Paso Heights, CA (21 exceedances)
Jordan River, UT (2 exceedances)

Chlorpyrifos: None (0 sites of 20) of the urban watersheds sampled from 2001-2004 exceeded a chlorpyrifos aquatic life benchmark. This is a deviation from the target performance of a reductions to 25% of urban watersheds exceeding an aquatic life benchmark. The more rapid than anticipated improvement in water quality may be due in part to the time line associated with the phase-out process of chlorpyrifos urban uses. On June 8, 2000, EPA announced an agreement with pesticide registrants to phase out and cancel nearly all indoor and outdoor residential uses of chlorpyrifos within 18 months, effectively eliminating use by homeowners. Residential uses were restricted to certified, professional, or agricultural applicators. Those uses that posed the most immediate risks to children (home lawn, indoor crack and crevice treatments, uses in schools, parks) were canceled first, ending as of December 31, 2001. The phase out resulted in a cancellation of nearly all homeowner uses and was effectively completed during this monitoring cycle. The 2011 target (which has been exceeded, based on this dataset) would result in 90 % of urban streams nationally that do not exceed a chlorpyrifos aquatic life benchmark

Malathion: 30% (6 sites of 20) urban watersheds sampled from 2001-2004 exceeded a malathion aquatic life benchmark. The percentage of sites with exceedances in this time period did not decline. This outcome was the target for 2008. OPP's 2011 target would result in 85 % of urban streams nationally that do not exceed a malathion aquatic life benchmark. The location of streams with exceedances and the number of exceedances is noted below.

Memphis, TN (5 exceedances)
Las Vegas, NV (2 exceedances)
Winnipauk, CT (1 exceedance)
Del Paso Heights, CA (8 exceedances)
Columbia, SC (3 exceedances)
Annandale, VA (2 exccedances)