Considering the Potential Repeal of Atrazine Prohibition Areas

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Atrazine Prohibition Repeal Process

ATCP 30.375 states that the department **may** choose to repeal or reduce an atrazine prohibition area (PA) if the following three conditions are met:

1. Three consecutive samples show TCR levels in exceedence well(s) to be at or below 50% of the ES
2. TCR levels in other wells in the PA must be at or below 50% of the ES
3. “The department determines, based on credible scientific evidence, that renewed use of atrazine products in the prohibition area is not likely to cause a renewed violation of the enforcement standard.”

Evaluating Condition 3 of the Repeal Process

DATCP - Syngenta Atrazine Reuse Study

Results Summary by Well

Sites with three or more applications of atrazine	
Criteria	Result
At least one well over the ES at a Site	9 of 9
Wells that start below the ES and later exceed the ES	9 of 16
Wells in medium texture soil that start below the ES and later exceed the ES	6 of 11
Wells in coarse texture soil that start below the ES and later exceed the ES	3 of 5

Conclusion of the Reuse Study

- Eight of eleven members of DATCP's advisory committee concluded that that the department should not move forward to repeal PAs at this time
- Based on this study the department recommended and the DATCP Board agreed to maintain the 102 existing PAs and not move forward with the repeal process at this time

Questions ?

Considering the Potential Repeal of Atrazine Prohibition Areas

Background on Atrazine Prohibition Areas in Wisconsin

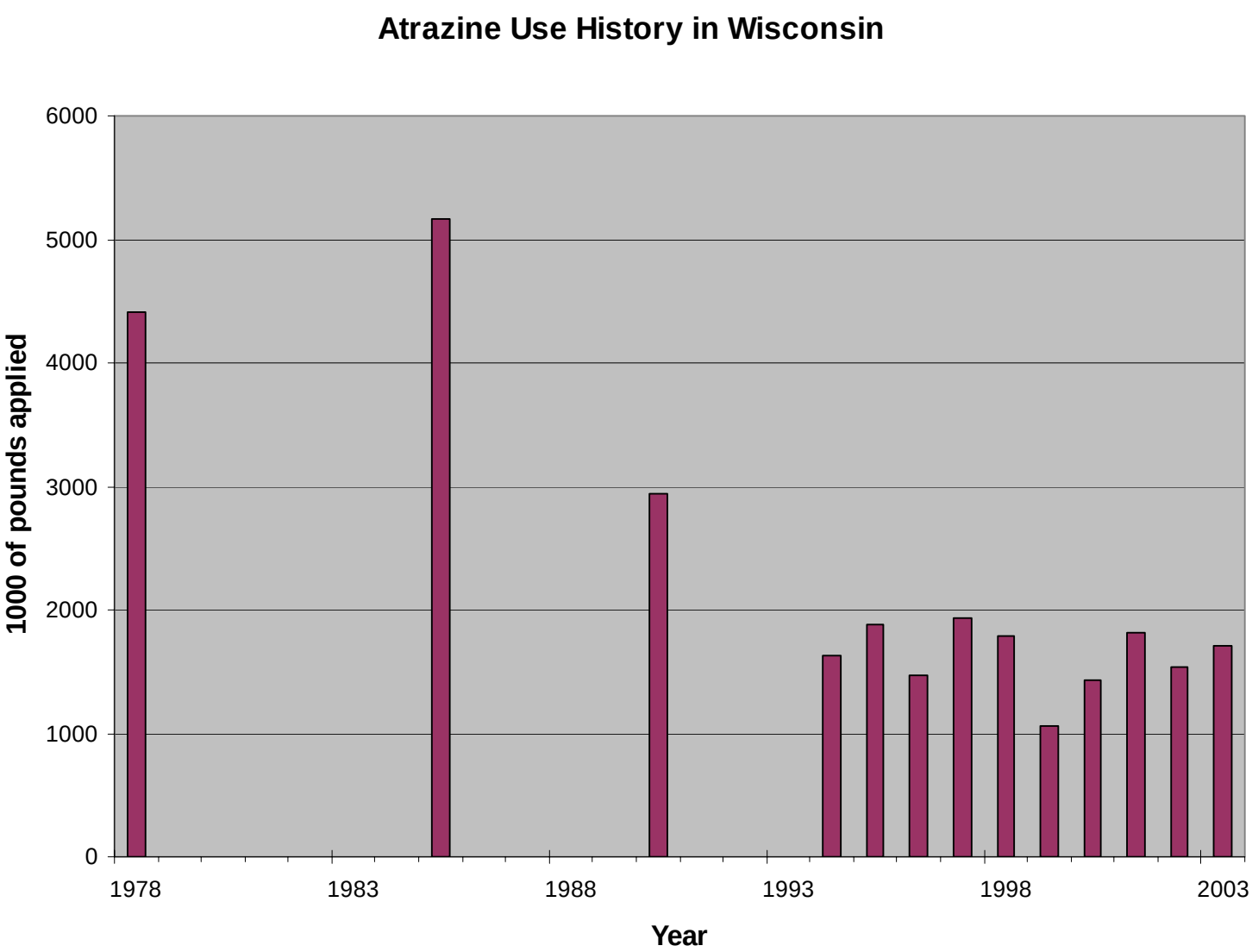
- The enforcement standard (ES) for atrazine is 3 ug/l
- The ES is based on the sum of parent atrazine and three chlorinated breakdown products of atrazine (sometimes called total chlorinated residues of atrazine or TCR)

Maximum annual amounts of atrazine active ingredient per year

Surface Soil Texture	Atrazine applied previous year	Atrazine Not applied previous year
Coarse	0.75	0.75
Medium/Fine	1.0	1.5

General Restrictions on Atrazine Use in Wisconsin

- There are currently 102 atrazine prohibition areas (PAs) covering 1.2 million acres in Wisconsin
- Atrazine use is prohibited at non-crop sites
- Timing of applications limited to between April 1 and July 31
- An irrigation management program required if irrigate a field to which atrazine is applied
- Records of atrazine applications must be kept for three years
- Maximum yearly rate depends on soil type


Atrazine Use History in Wisconsin
6000
5000
4000
3000
2000
1000
0
1000 of pounds applied
1978
1983
1988
1993
1998
2003
Year

Atrazine Prohibition Repeal Process

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Evaluating Condition 1 of the Repeal Process

DATCP Exceedence Survey

DATCP Exceedence Survey

- Program began in 1995 and includes over 150 “highly impacted” wells
- Includes farm and non-farm wells
- Most wells are in the program because they exceeded the atrazine Enforcement Standard of 3 ppb

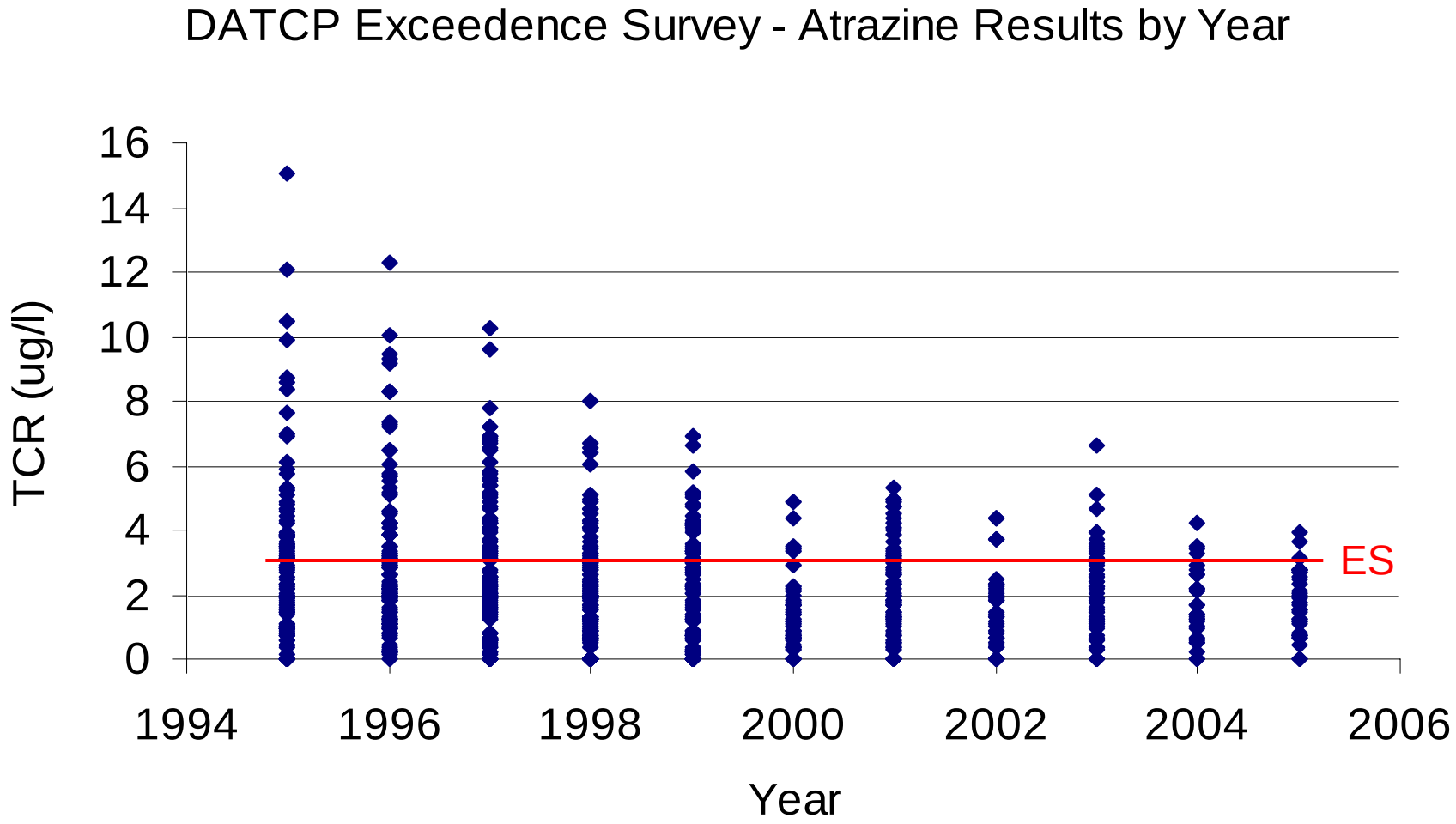
Program Objectives

- Provide a public service to well owners
- Study how the pesticide levels in the wells change over time
- Track atrazine levels in Prohibition Areas as part of a potential repeal process

Atrazine Results

Monitoring atrazine levels in 143 wells

- 94 wells have decreasing atrazine levels
- 17 wells are stable
- 3 wells have increasing atrazine levels
- 29 have no trend (less than four samples)
- As of 2005, 10 of 143 wells are still above 3.0 ppb TCR


DATCP Exceedence Survey - Atrazine Results by Year
TCR (ug/l)
16
14
12
10
8
6
4
2
0
1994
1996
1998
2000
2002
2004
2006
Year
ES

Potential Repeal of PAs
(ATCP 30.375)

- DATCP is tracking 143 wells that led to the creation of 102 Atrazine Prohibition Areas
- 58 *wells* currently meet repeal condition 1
- 21 *Prohibition Areas* currently meet condition 1
- 25 wells have been abandoned during the course of the program

Evaluating Condition 2 of the Repeal Process

Sampling Other Private Wells in PAs

Evaluating Condition 3 of the Repeal Process

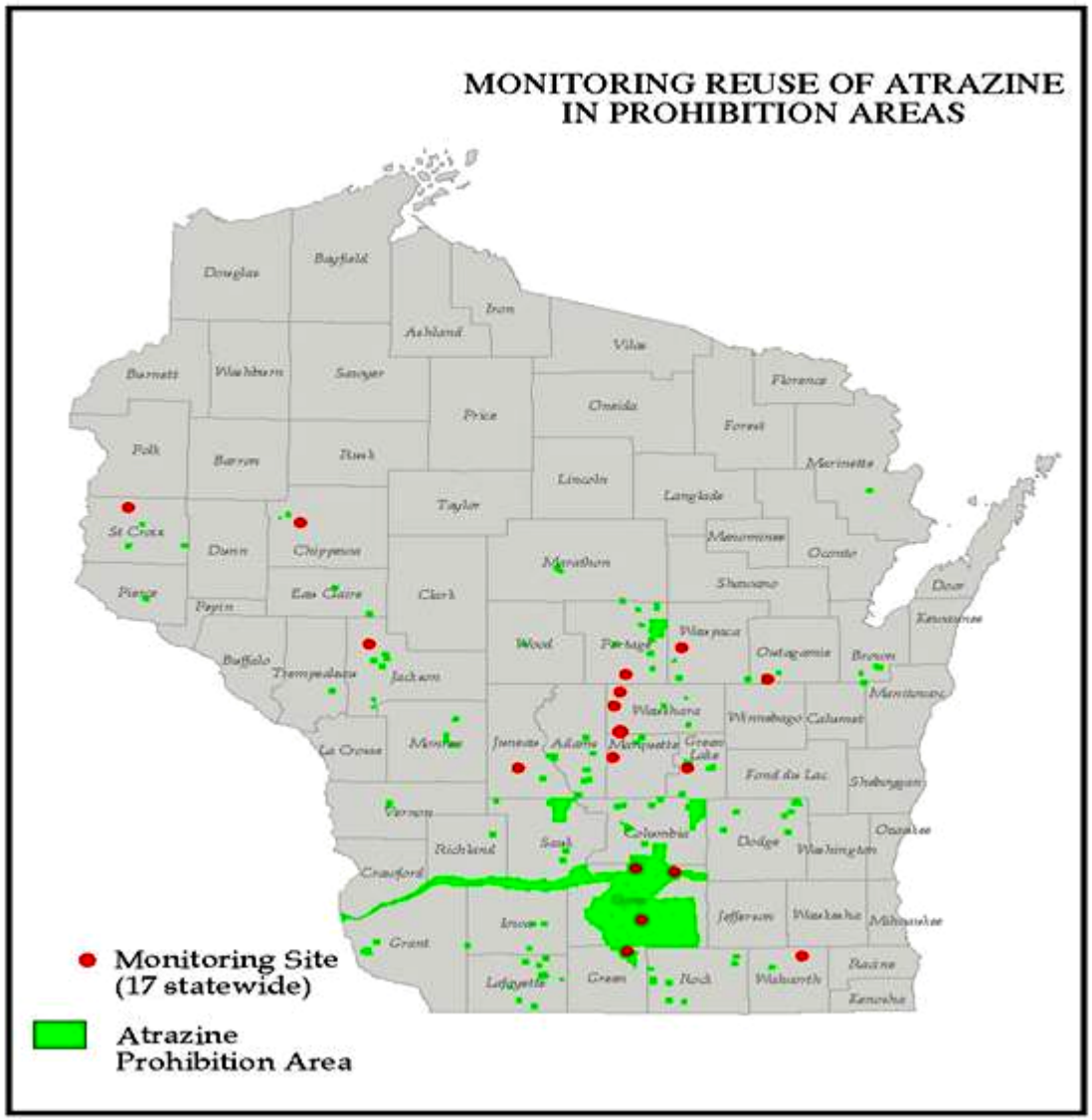
DATCP Atrazine Reuse Study

Atrazine Reuse Study

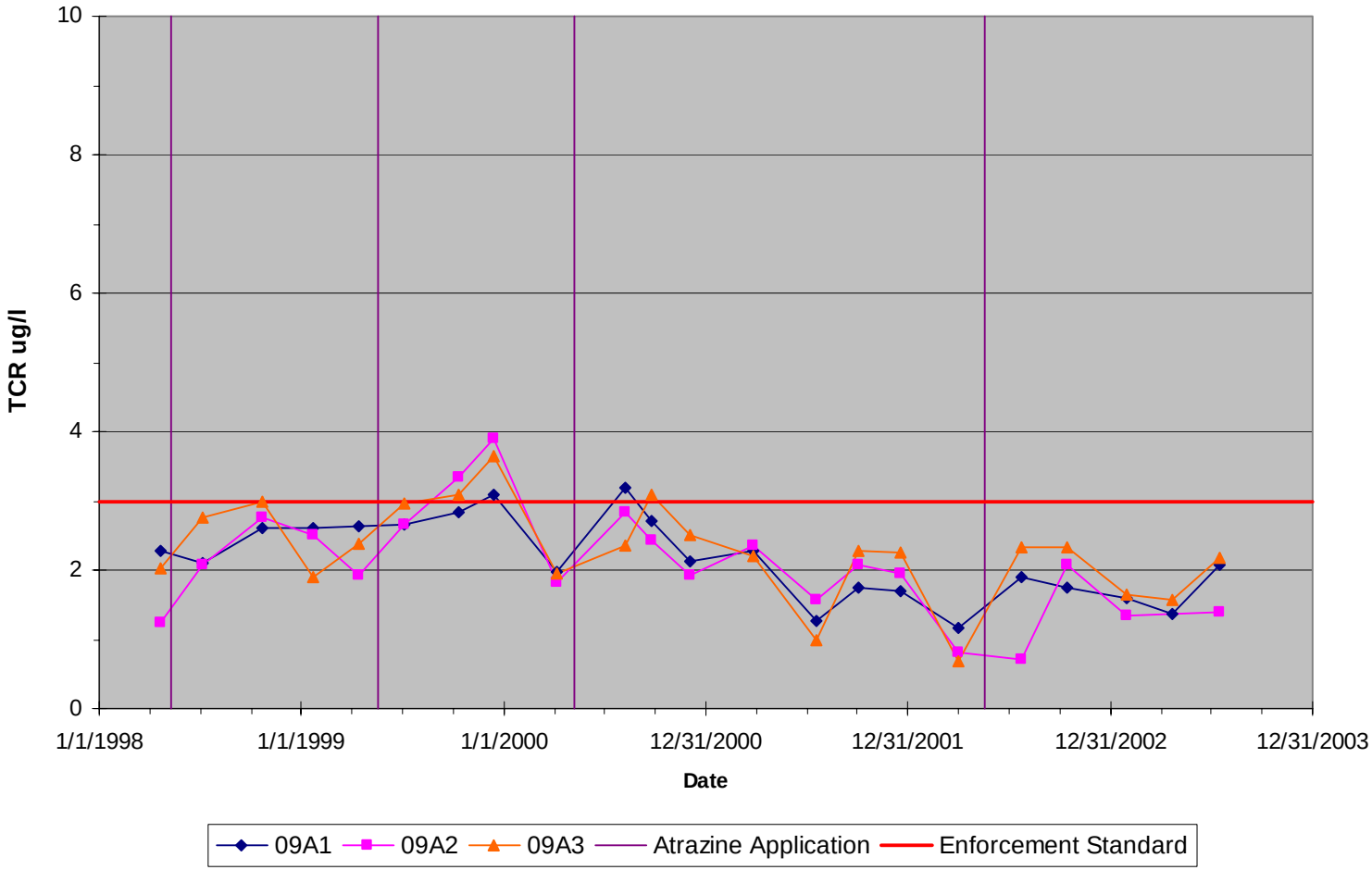
- The Atrazine Reuse Study was performed to help answer the third rule condition
- The results of the study were meant to represent other similar settings in the state
- The intent was ***not*** to require a monitoring well study in each PA before considering repeal

Design of the Atrazine Reuse Study

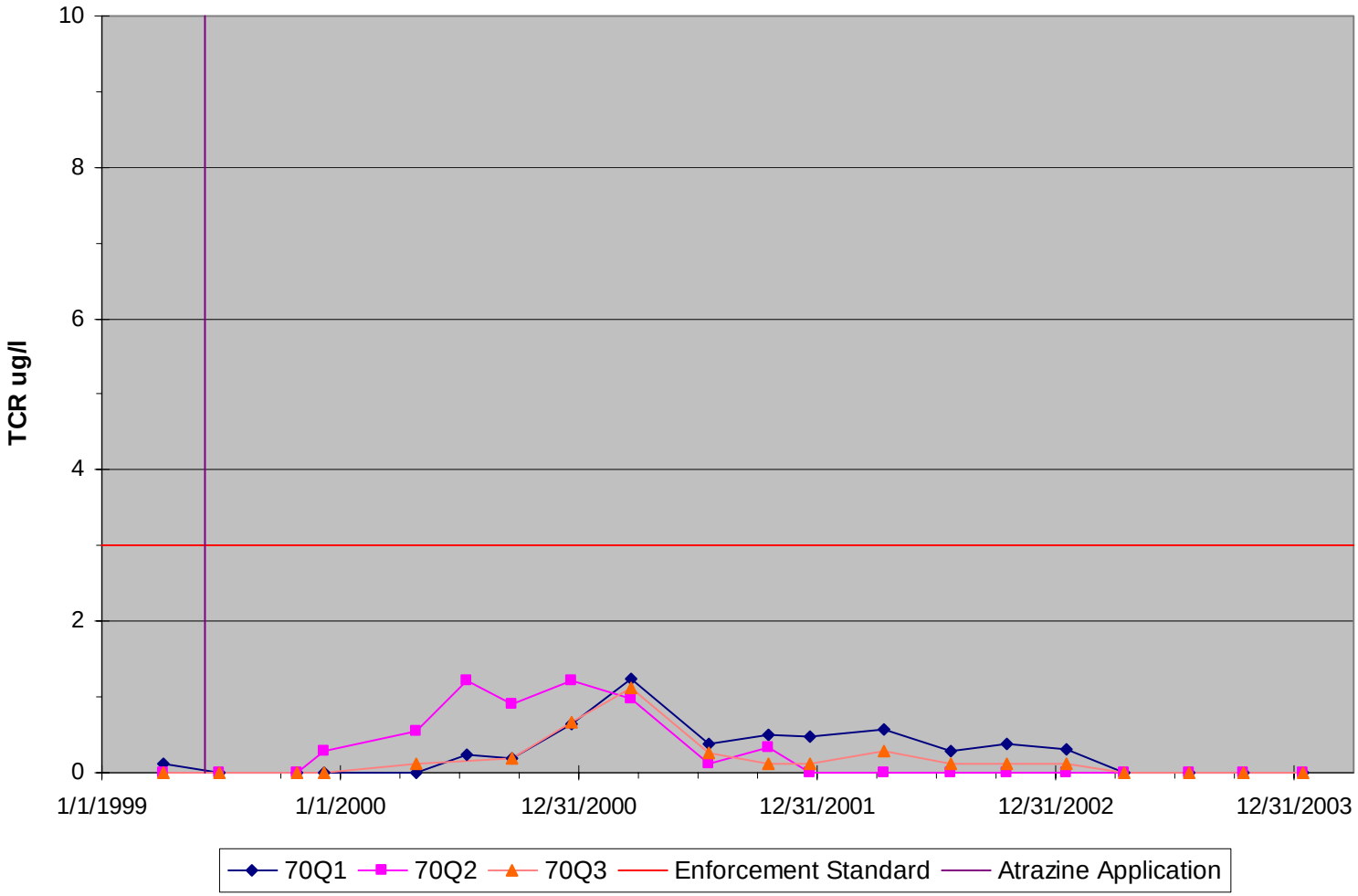
Goal	What We Got
21-24 sites	17 sites
In oldest PAs (1993)	In PAs 1995 and earlier
Coarse, medium and fine texture	Coarse and medium
10 – 20 acre fields	9.7 – 39 acre fields
3 wells in middle of field	3 in-field wells plus one field edge
Sample wells quarterly	Sampled wells quarterly
Atrazine applied at least 3 times	3 or more times at 10 sites
Minimum of 5 years of sampling	5 – 7 years of sampling


MONITORING REUSE OF ATRAZINE
IN PROHIBITION AREAS
Douglas
Bayfield
Iron
Ashland
Vilas
Florence
Burnett
Washburn
Sawyer
Price
Oneida
Forest
Polk
Barron
Rusk
Lincoln
Langlade
Marinette
Taylor
St Croix
Dunn
Chippewa
Menominee
Oconto
Marathon
Shawano
Door
Pierce
Pepin
Eau Claire
Clark
Kewaunee
Wood
Portage
Waupaca
Outagamie
Brown
Buffalo
Trempealeau
Jackson
Manitowoc
Waushara
Winnebago
Calumet
La Crosse
Monroe
Juneau
Adams
Marquette
Green Lake
Fond du Lac
Sheboygan
Vernon
Columbia
Ozaukee
Richland
Sauk
Dodge
Washington
Crawford
Jefferson
Waukesha
Milwaukee
Iowa
Grant
Lafayette
Green
Rock
Walworth
Racine
Kenosha
Monitoring Site
(17 statewide)
Atrazine
Prohibition Area

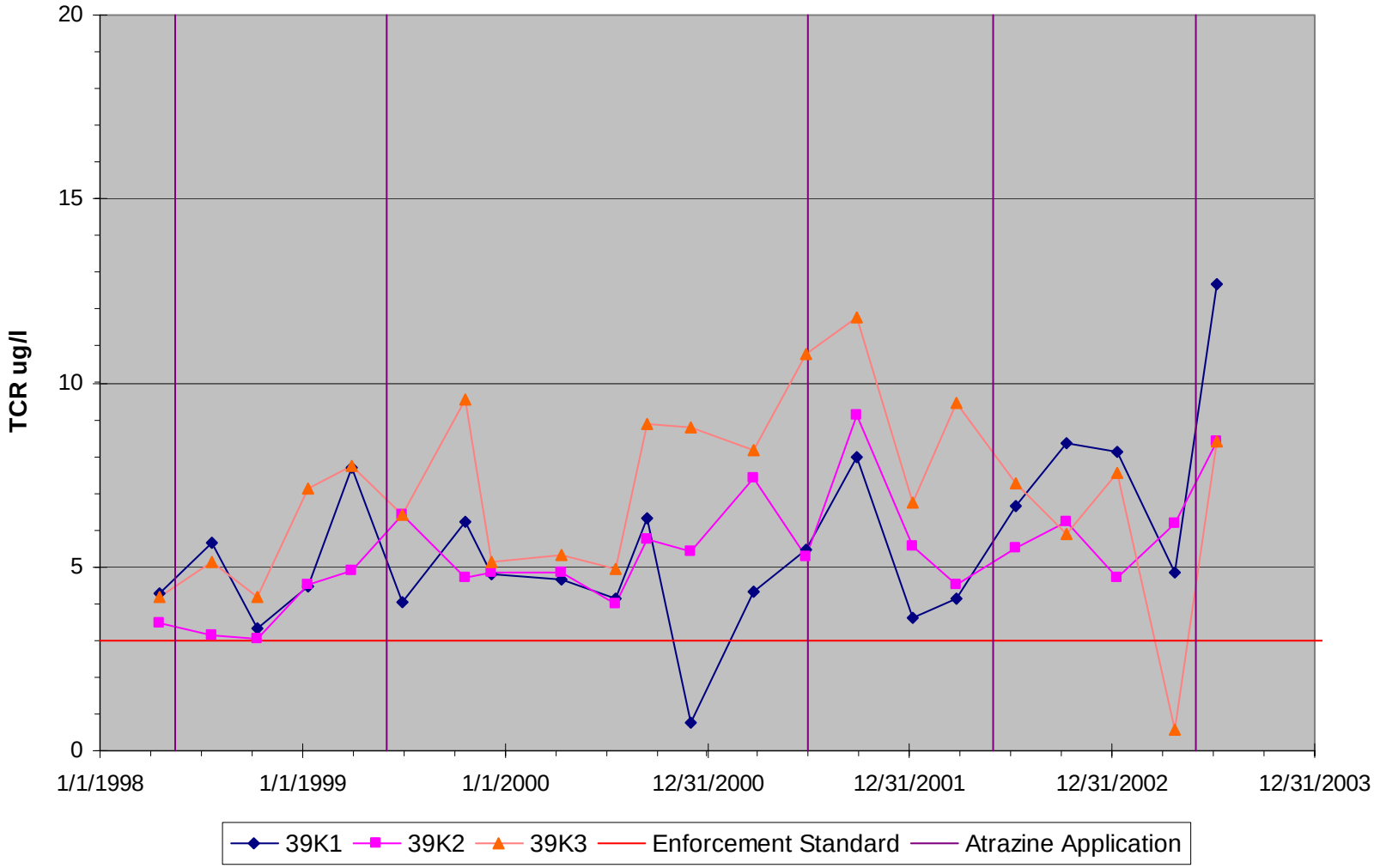
Site 09A - Medium Soil Texture (soil test coarse)
In Prohibition Area Since 1995
Scott Lake loam (soil test sandy loam) 2.1% OM



Site 70Q - Coarse Texture Soil
In Prohibition Area Since 1993
Irrigated Plainfield sand 1.0% OM



Site 39K - Coarse Texture Soil
In Prohibition Area Since 1993
Briggsville sandy loam 1.6% OM



Results Summary by Site

9 Sites with three or more applications of atrazine	
Criteria	Result
At least one well over the ES	9 of 9
All wells start below the ES, one or more later exceed the ES	4 of 4
7 sites with one or two applications of atrazine	
At least one well over the ES	3 of 7
All wells start below the ES, one or more later exceed the ES	1 of 5

Results Summary by Well

9 Sites (27 wells) with three or more applications of atrazine	
Criteria	Result
Wells that start below the ES and later exceed the ES	9 of 16
Wells that start above ES and later increase by more than the ES	9 of 11
Wells in medium texture soil that start below the ES and later exceed the ES	6 of 11
Wells in coarse texture soil that start below the ES and later exceed the ES	3 of 5

Results Summary by Well

7 Sites (21 wells) with one or two applications of atrazine	
Criteria	Result
Wells that start below the ES and later exceed the ES	5 of 19
Wells that start above ES and later increase by more than the ES	1 of 2
Wells in medium texture soil that start below the ES and later exceed the ES	3 of 5
Wells in coarse texture soil that start below the ES and later exceed the ES	2 of 14

Atrazine Technical Advisory Committee Input

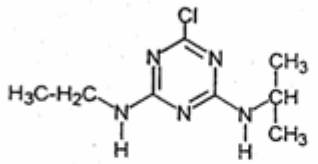
- Eight of the eleven members concluded that that the department should not move forward to repeal PAs at this time
- Two of the members concluded that this study along with other information supports repealing PAs and suggested a five year trial basis of repealing entire PAs
- One member was undecided

Departmental Recommendation

- Based on this study the department recommends maintaining the 102 existing PAs and not moving forward with the repeal process at this time

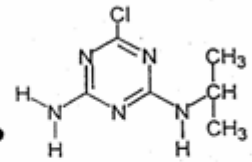
Common Metabolites of Triazine Herbicides: A Complicating Factor

Common Metabolites of s - Triazines



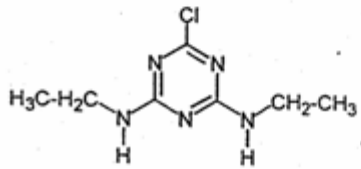
2-chloro-4-ethylamino-6-isopropylamino-*s*-triazine

ATRAZINE



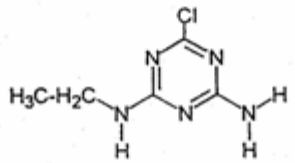
2-chloro-4-amino-6 isopropylamino-*s*-triazine

DEETHYL ATRAZINE



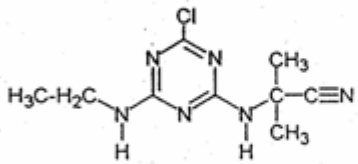
2-chloro-4,6-diethylamino-*s*-triazine

SIMAZINE



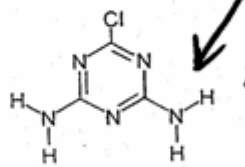
2-chloro-4-amino-6-ethylamino-*s*-triazine

DEISOPROPYL ATRAZINE



2-chloro-4-ethylamino-6-nitriloisopropylamino-*s*-triazine

CYANAZINE



2-chloro-4,6-diamino-*s*-triazine

DIAMINO ATRAZINE

Triazine use prior to the start of the Reuse Study

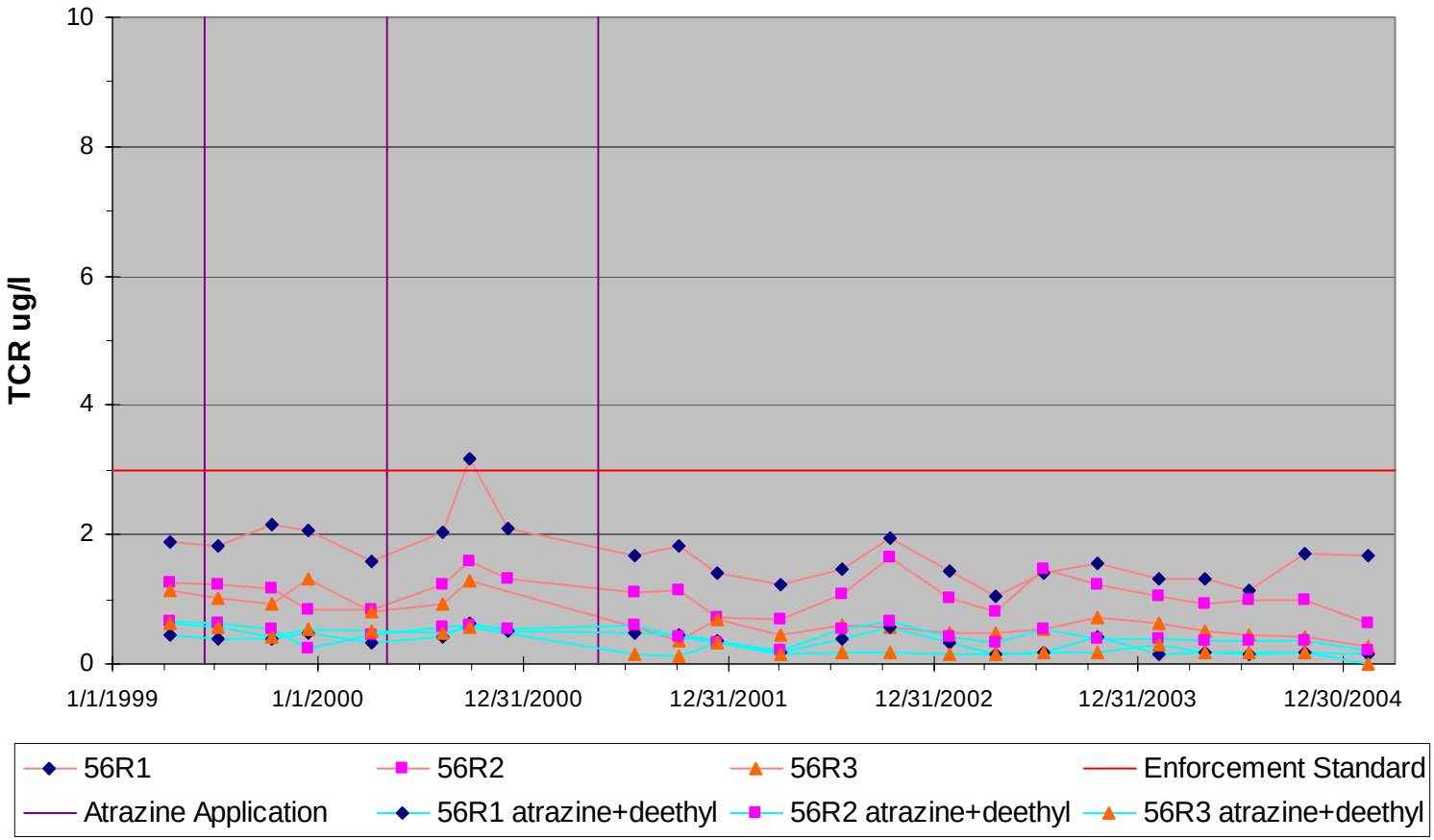
- Cyanazine (Bladex) used at five sites
- Simazine (Princep) used at two sites
- Cyanazine and simazine used at one site
- Triazine use at 8 of 16 sites prior to study

How can we deal with this issue?

- We can look at the data for just atrazine + deethyl atrazine, which we know can only come from atrazine
- This is a very conservative approach because we know it underestimates the total contribution from atrazine

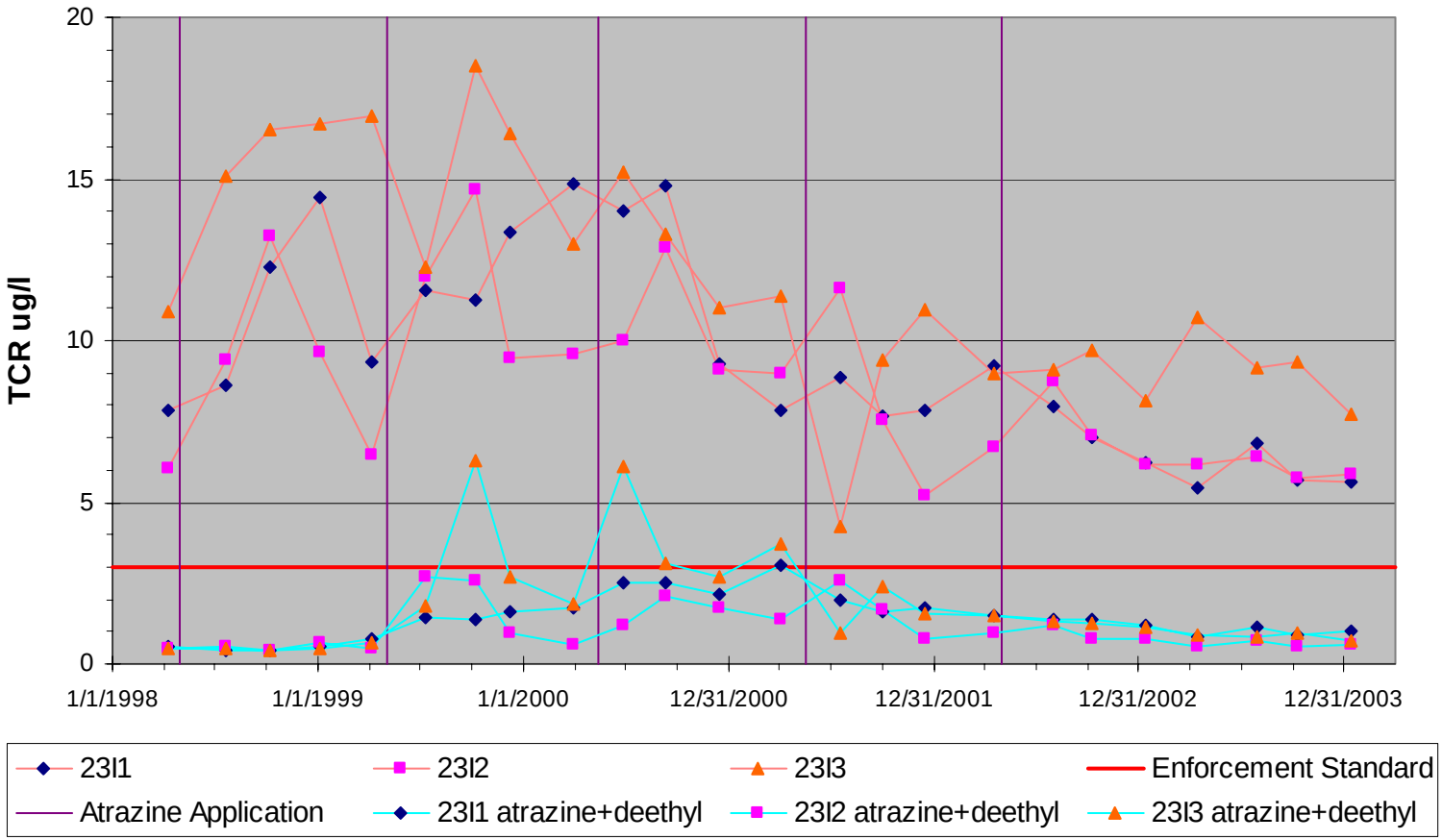
Site 56R - Medium Texture Soil
In Prohibition Area Since 1994
Sattre silt loam 3.0% OM

No prior cyanazine or simazine



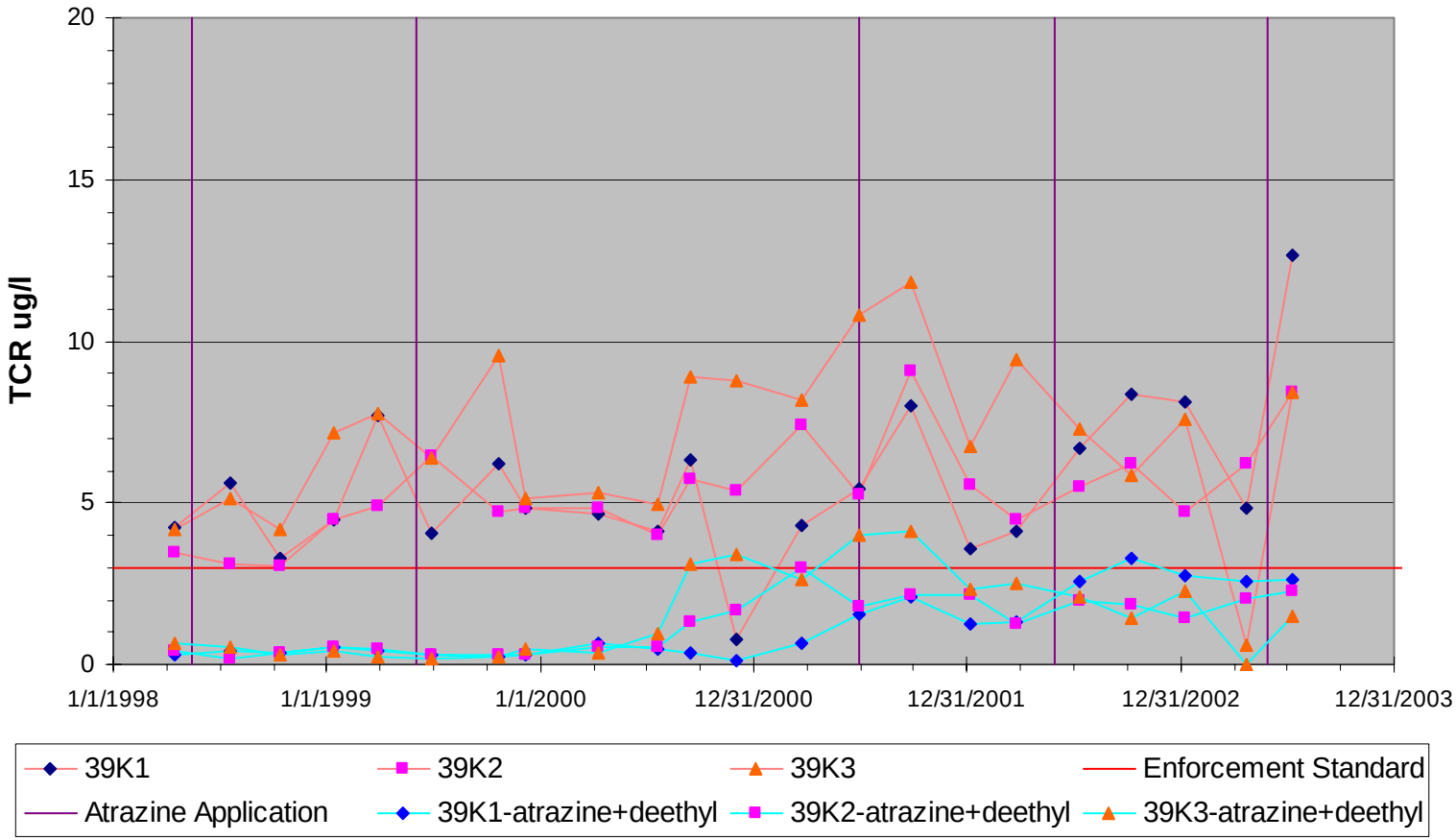
Site 23I - Medium Texture Soil
In Prohibition Area Since 1996
Irrigated Ockley loam 1.6% OM

Prior cyanazine use

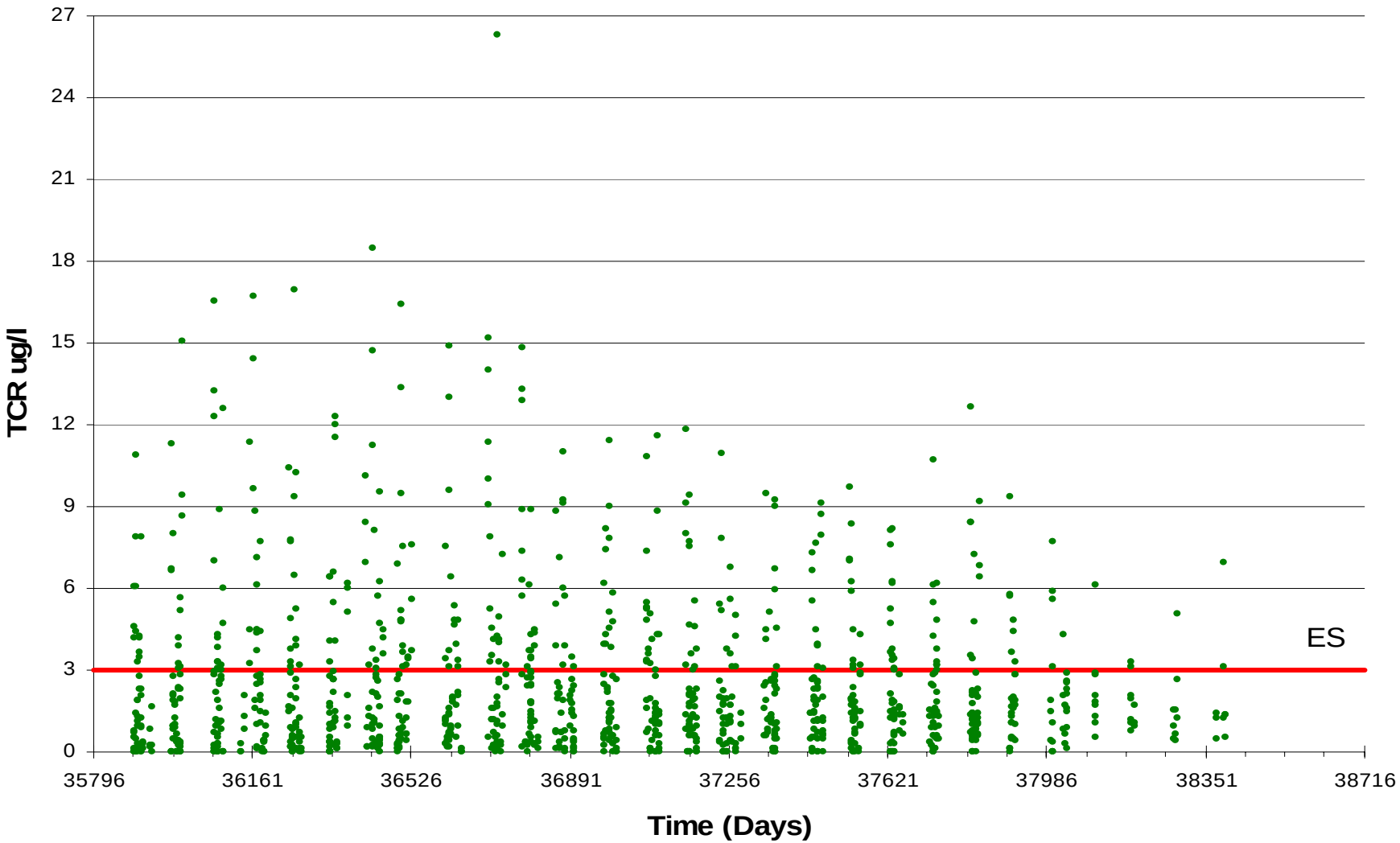


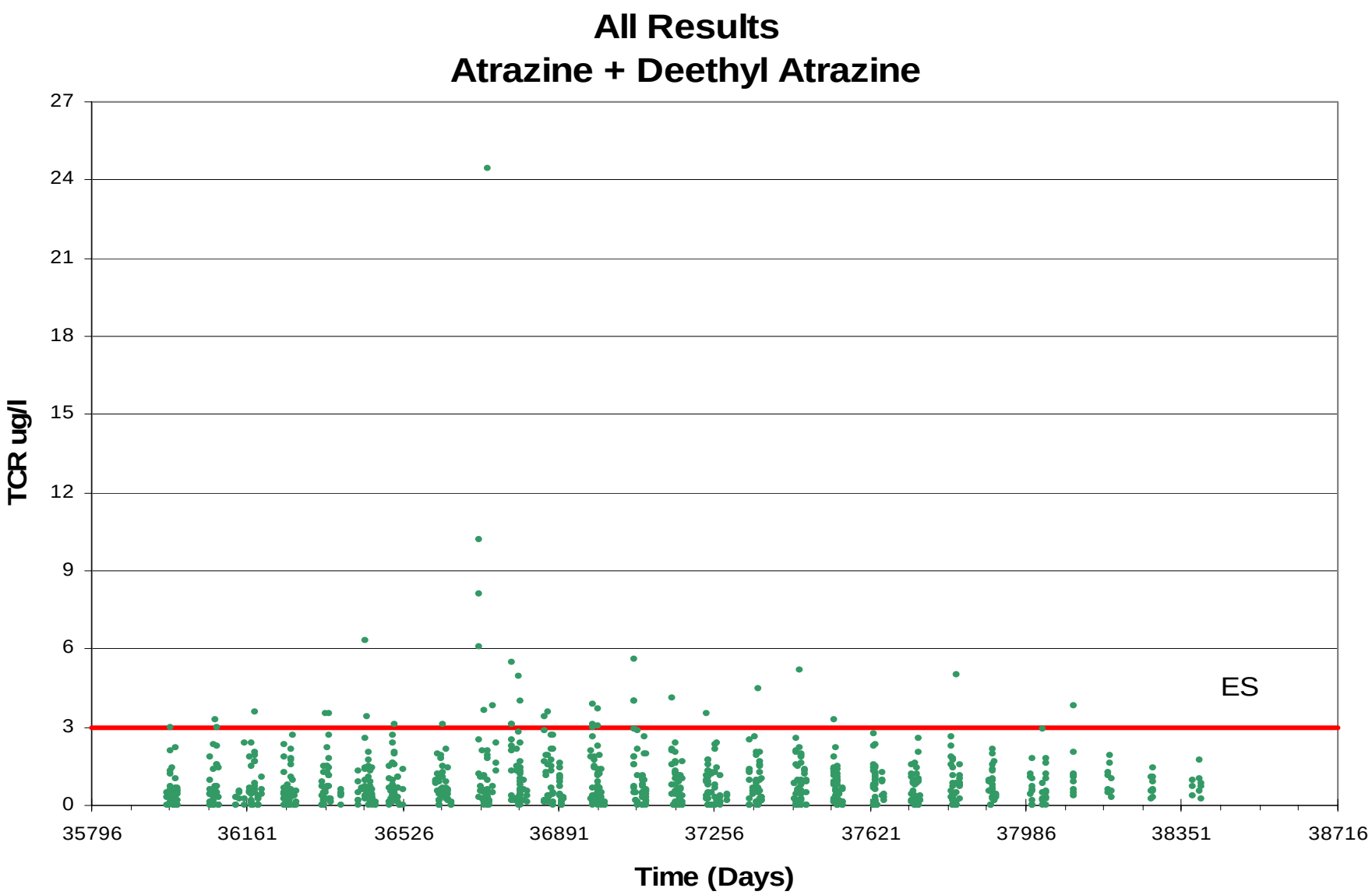
Site 39K - Coarse Texture Soil
In Prohibition Area Since 1993
Briggsville sandy loam 1.6% OM

Prior cyanazine use



All TCR Results




All Results
Atrazine + Deethyl Atrazine
TCR ug/l
27
24
21
18
15
12
9
6
3
0
ES
35796
36161
36526
36891
37256
37621
37986
38351
38716
Time (Days)

Summary of Triazine Interactions

- It would be great to have sites with no previous use of triazine herbicides…
- Looking at just atrazine + deethyl atrazine, we see exceedences and increasing concentrations at some sites
- We need to recognize this issue and continue with the interpretation of the data

Why do some wells start out over ES?

- Other triazine herbicide use at sites before the study began (Bladex or Princep)
- Persistence (long half-life) of atrazine in soil