COLORADO DEPARTMENT OF AGRICULTURE

Agricultural Chemicals and Groundwater Protection

Lower South Platte – 2010 Groundwater Monitoring Report

The Agricultural Chemicals & Groundwater Protection Program (Program) is responsible for conducting monitoring to detect the presence of commercial fertilizer constituents and pesticide compounds (agrichemicals) in groundwater throughout Colorado. This program has been established to provide current, scientifically valid, groundwater quality data to the Commissioner of Agriculture and the general public.

This report discusses monitoring history in the Lower South Platte network, sample collection and analysis information for the 2010 field season, as well as statistics and maps detailing laboratory results. Any information pertaining to sampling frequency and purpose, sampling network development, laboratory methodology and protocol, Lower South Platte location and character, and long–term history of the Program, is available in greater detail from these documents found on the Program webpage (http://www.colorado.gov/ag/gw):

- Agricultural Chemicals & Groundwater Protection in Colorado 1990–2006
- Long–Term Groundwater Monitoring Strategy and Plan: May 2007
- Agricultural Chemicals & Groundwater Protection Program SOP Manual
- Groundwater Monitoring Database
- Colorado Dept. of Agriculture Groundwater Laboratory Analytical SOPs

Groundwater Quality Monitoring History

Monitoring efforts in the South Platte River Basin, by the Program began with a sampling of 96 domestic wells in 1992. Samples were collected along the South Platte River from just north of Denver–metropolitan to Julesburg. This sampling event resulted in the discovery of nitrate above naturally occurring concentrations in many locations, and helped to indicate key areas of the basin with nitrate concentrations above the U.S. Environmental Protection Agency's (EPA) primary drinking water standard of 10.0 milligrams–per–liter (mg L^{-1}) or parts–per–million (ppm). Of the 96 domestic wells sampled, 34% contained nitrate above the EPA standard and only eight wells resulted in no detection above the nitrate–nitrogen minimum detection limit of 0.5 ppm. The majority of wells above the EPA standard were found in Weld County from just north of Brighton to Greeley and then eastward past Kuner. Another collection of wells with similar properties extended from Masters just east of the Morgan County line eastward to Brush. And finally, multiple wells in Sedgwick County, from Sedgwick to Julesburg were found to be above the EPA nitrate standard.

In 1993, an additional sampling of 47 wells was conducted exclusively in Morgan and Sedgwick counties in order to confirm and further define the nitrate contamination in those areas. Only 21 of the sites were re–samples from the 1992 effort, with the remaining wells serving to improve coverage in both counties. These results confirmed the presence of nitrate contamination in that portion of the aquifer. **Table 1** shows some general statistics for samples collected in 1992 and 1993. The distribution of samples and their corresponding nitrate results are seen in **Figure 1a** (1992) and **Figure 1b** (1993). Weld County was not included in the 1993 sampling because of time and personnel limitations; however, 1992 results confirmed previous studies by the Northern Front Range Water Quality Planning Association and other entities which had documented and delineated agrichemical contamination in Weld County groundwater.

A total of 33 detections of pesticide compounds were discovered in 1992. The most often detected compound was atrazine with 78.8% of all detections ranging in concentration from 0.25 to 1.38 micrograms–per–liter (µg

South Platte Basin Groundwater Nitrate-Nitrogen Results		
	1992	1993
# of Wells Sampled	96	47
Average	9.4	11.3
25th Percentile	3.3	5.1
Median	7.0	9.5
75th Percentile	13.0	15.7
Maximum	37.0	41.0
Standard Deviation	8.0	8.3
# of Wells ≥ 10.0	33	18
# of Wells BDL	8	2

Table 1. Nitrate–nitrogen statistics for samples collected from groundwater in the South Platte River alluvium. BDL is below detection limit.

L^{-1}) or parts–per–billion (ppb). Atrazine is a herbicide commonly used to control broadleaf weeds in corn. As a major corn production region, it is not surprising to see some atrazine contamination in the South Platte River Basin. No atrazine detection was above the EPA drinking water standard of 3.0 ppb. There were also two detections of alachlor, and single detections of benfluralin, DCPA, diazinon, EPTC, and hexazinone. All detected pesticide compounds were herbicides except for the single detection of diazinon which is an insecticide. One location down gradient of agricultural crops and a concentrated animal feeding operation, contained four different herbicides in it: alachlor, atrazine, benfluralin, and EPTC. Alachlor was measured at 3.0 ppb which exceeds the EPA drinking water maximum contaminant level of 2.0 ppb. Alachlor is used in similar fashion to atrazine for broadleaf weed control in corn.

These results indicated that pesticide use was having an impact on South Platte alluvial groundwater quality and encouraged the development of a long–term monitoring well network. Concurrently in 1993, the United States Geologic Survey (USGS) was installing a network of monitoring wells as part of their nationwide evaluation of water quality in the Lower South Platte Alluvial Aquifer from Denver–metropolitan to the confluence of the South Platte and North Platte rivers in North Platte, Nebraska. Other groundwater aquifers throughout the nation were included in their studies conducted under the North America Water Quality Assessment program. Through cooperation with USGS and water conservation districts – Northern Front Range, Central Colorado, Lower South Platte – the Program was allowed access to monitoring wells for sampling. As a result, the Program defined a collection of 20 monitoring wells in Weld County, distributed from near Brighton to north of Greeley, as an annually sampled long–term monitoring well network, and a second set of 20 monitoring wells distributed from around Wiggins eastward to Ovid near the Nebraska state line as its Lower South Platte (LSP) network.

The LSP network was first sampled in 2001 and yielded results similar to those from the earlier work on domestic wells. The fact that the monitoring wells were installed within the defined areas of interest (groups of domestic wells with elevated nitrate or detected pesticides), as well as other locations within the aquifer, facilitate representative sampling of the shallow aquifer every other year.

Nitrate concentrations discovered in the initial sampling of the LSP network showed an average nitrate–nitrogen of 12.3 ppm and a median of 9.6 ppm. Seven wells were above the EPA standard and the maximum concentration discovered was 74 ppm. **Figure 1c** shows the distribution of samples and their corresponding nitrate results. Most of the wells exceeding the EPA standard are in the western half of the LSP. The maximum concentration was found near Brush from a well (LSP–M–004) located in an area with land uses that include irrigated agriculture, industrial power plant facilities, greenhouse operations, rural residential and urban development, and rangeland. The elevated nitrate in Well 4 was believed to be a cumulative effect of some of these land uses impacting the shallow groundwater in the area.

A total of 17 pesticide detections were discovered in 2001 with seven each of atrazine and its degradation product desethyl–atrazine. Concentrations ranged from 0.1 to 1.2 ppb for these compounds, below the EPA standard of 3.0 ppb. Single detections of metalaxyl, metolachlor, and prometon were also discovered. The highest reported concentration was 3.05 ppb of metolachlor which is well below the EPA Lifetime Health Advisory Limit of 70 ppb. The well with the maximum nitrate concentration was also the only well with four different pesticide compounds detected: atrazine, desethyl–atrazine, metalaxyl, and prometon. All of the pesticide compounds reported in 2001, have chemical–physical properties identified in the United States Department of Agriculture – Natural Resources Conservation Service's Win–PST (Windows Pesticide Screening Tool) pesticide database (http://www.wsi.nrcs.usda.gov/products/W2Q/pest/winpest31.html) that give them a high leaching potential risk. Metalaxyl is a fungicide commonly used as a corn seed coating to control water–mold fungi but also has uses in greenhouse applications so its presence in groundwater in the Brush area is understandable. Fortunately, metalaxyl has a low toxicity to human, aquatic, and avian health.

In 2007, the Program created the Long–Term

Groundwater Monitoring Strategy and Plan which designated the sampling frequency for the LSP network to be every other year. The Program implemented this plan in 2008 and 17 of the original 20 wells were sampled. Detected nitrate concentrations were lower than those initially reported in 2001. The median nitrate–nitrogen concentration was 5.4 ppm with a range in concentration from 1.2 to 260 ppm. The well with the maximum concentration was the same well that had the maximum of 74 ppm in 2001 (Well 4). Upon discovery of such a high nitrate concentration the Program investigated the area surrounding Well 4 and found a long, shallow, unlined pond draining to an irrigation canal that leads to a South Platte River tributary, Beaver Creek. Both the pond and sections of the irrigation canal were undergoing significant eutrophication. Eutrophication is a process where water bodies receive excess nutrients that stimulate excessive aquatic plant growth. The most common cause of eutrophication is high nitrogen and phosphorus content. Eutrophication is usually an indicator of poor fertility and/or irrigation management but can also result from naturally occurring heavy precipitation events and flooding of agricultural fields after fertilizing.

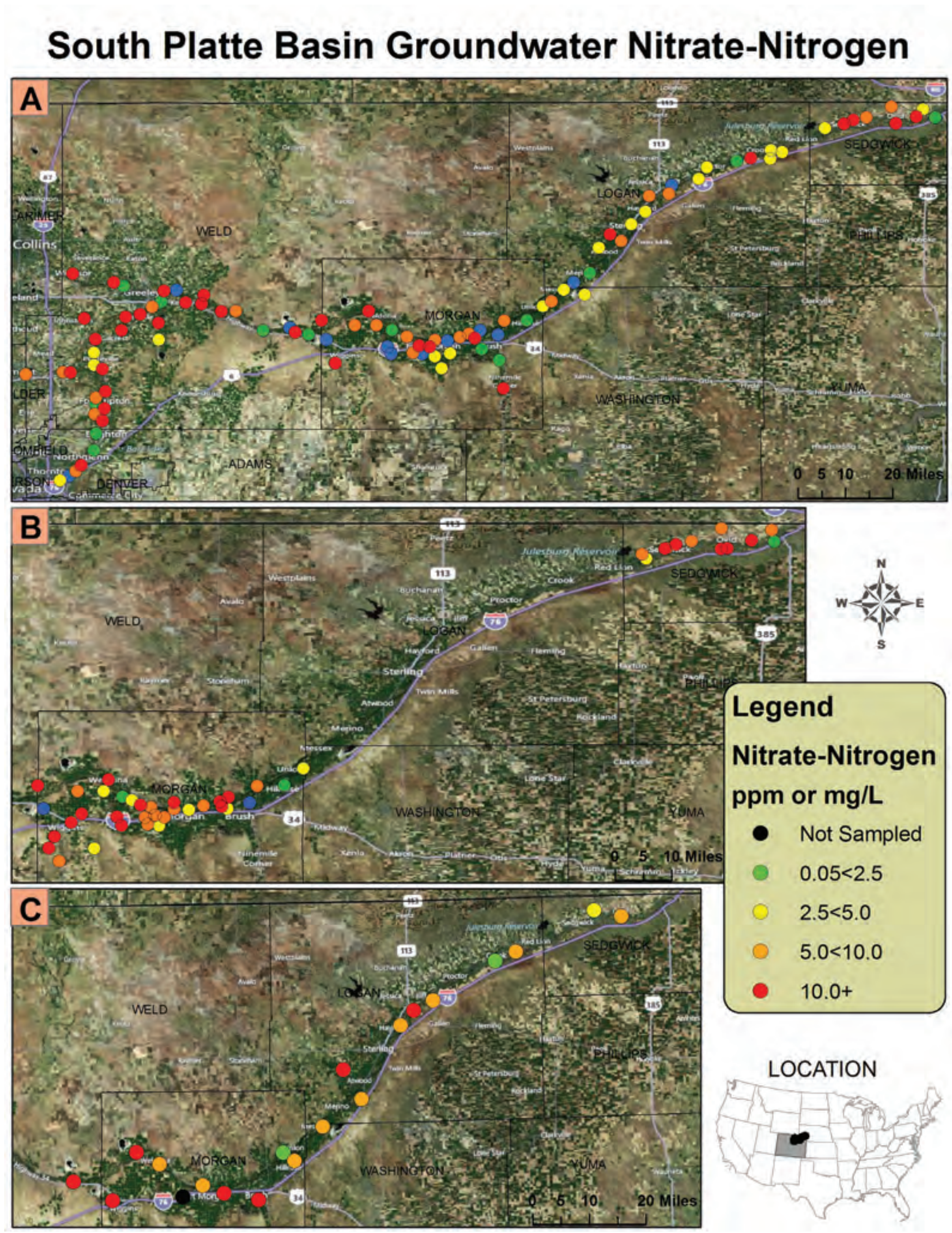

Figure 1. Maps showing sample distribution and nitrate–nitrogen results for South Platte Basin groundwater domestic wells sampled in 1992 (A) and 1993 (B), and for monitoring wells sampled in 2001 (C). 'ppm' is parts–per–million. 'mg/L' is milligrams–per–liter.

Given the exorbitantly high nitrate concentration discovered in Well 4, and the eutrophication seen in a nearby pond, an investigation ensued to determine the source of the water in the pond. A nearby greenhouse operation was found to have a waste stream effluent of 75,000 gal d^{-1}, during peak summer production, which drained into the pond in question. The effluent was measured by the greenhouse operator to contain greater than 300 ppm of nitrate–nitrogen. Although the area up–gradient of the greenhouse and the monitoring well contains hundreds of acres of irrigated agriculture – irrigated corn in particular, which is known to be a potential nitrate leaking system in coarse–textured soils – it is believed the concentrations being measured in the monitoring well were most likely a result of the point source discharge into the pond which is also up–gradient of the monitoring well. These results and findings were provided to the Program's liaison with the Colorado Department of Public Health and Environment (CDPHE) for further action.

Excluding Well 4, the network sample results were comparable to 2001 with higher concentrations occurring in the western half of the LSP. Changes in concentration ranged from a decrease of 8.6 ppm to an increase of 12.9 ppm with five wells above the EPA standard just as was the case in 2001; although not all five wells above the standard were the same each year. All wells had detectable concentrations of nitrate which agrees with the 92% of domestic wells measured in 1992 containing detectable concentrations. With the exception of Well 4, the impact to groundwater quality from nitrate has neither increased nor decreased over the 16 years prior to the 2008 sampling.

Pesticide detections in 2008 were limited, which may be partially attributed to the higher detection limits used by the Program's laboratory that year. In particular, the most commonly detected pesticides in the LSP – atrazine and desethyl atrazine – had minimum detection limits (MDL) of 0.123 ppb whereas historically, the laboratory was consistently achieving lower MDLs over time from a high of 0.5 ppb in 1995 to a low of 0.052 in 2006. With more than a 10–fold increase in the MDL for some pesticides, it is believed that the small number of pesticide detections found in 2008 may not indicate a significant change in groundwater quality in the LSP. Of the five pesticide detections reported, four were in Well 4, which suggests groundwater in the Brush area is very vulnerable to contamination with agrichemicals. No detections were above established EPA drinking water standards; however, it is important to note that very few pesticides actually have standards.

2010 Sampling and Lab Analysis Notes

Sampling of the 19 wells in the LSP network in 2010 took place mostly from August 4–11. However, Well 4 was sampled six times (May 24th thru November 10th), due to a request from CDPHE to monitor the nitrate concentration throughout the growing season. Samples were sent to the Program's Groundwater Laboratory in Denver, CO, where they were screened for concentrations of 102 different pesticide compounds, nitrate and nitrite. In 2010, an opportunity to have an additional sample analyzed qualitatively for 600+ pesticide compounds was pursued and five samples were sent to the Center for Environmental Mass Spectrometry (CEMS) at the University of Colorado in Boulder, CO. A list of all quantitatively determined analytes screened for and their reporting limits is found in **Table 3** at the end of this report. For clarification, qualitative analysis shows the presence or absence of a compound, while quantitative analysis provides the concentration of a detected compound.

2010 Nitrate Results

Nitrate concentration for the LSP network in 2010 showed a median of 8.0 ppm and a range from 1.1 to 128.9 ppm. Excluding Well 4, the maximum is only 21.1 ppm. The average concentration for the six samples collected from Well 4 was 104.8 ppm with a low of 82.4 ppm in May and a high of 128.9 ppm in August. This well also had a detection of nitrite–nitrogen in August at 1.5 ppm and another in September at 2.6 ppm which both exceed the EPA drinking water standard of 1.0 ppm.

There were three wells that were at or near the EPA standard of 10.0 ppm (nitrate–nitrogen) in 2001, but had decreased to concentrations less than 2.2 ppm by

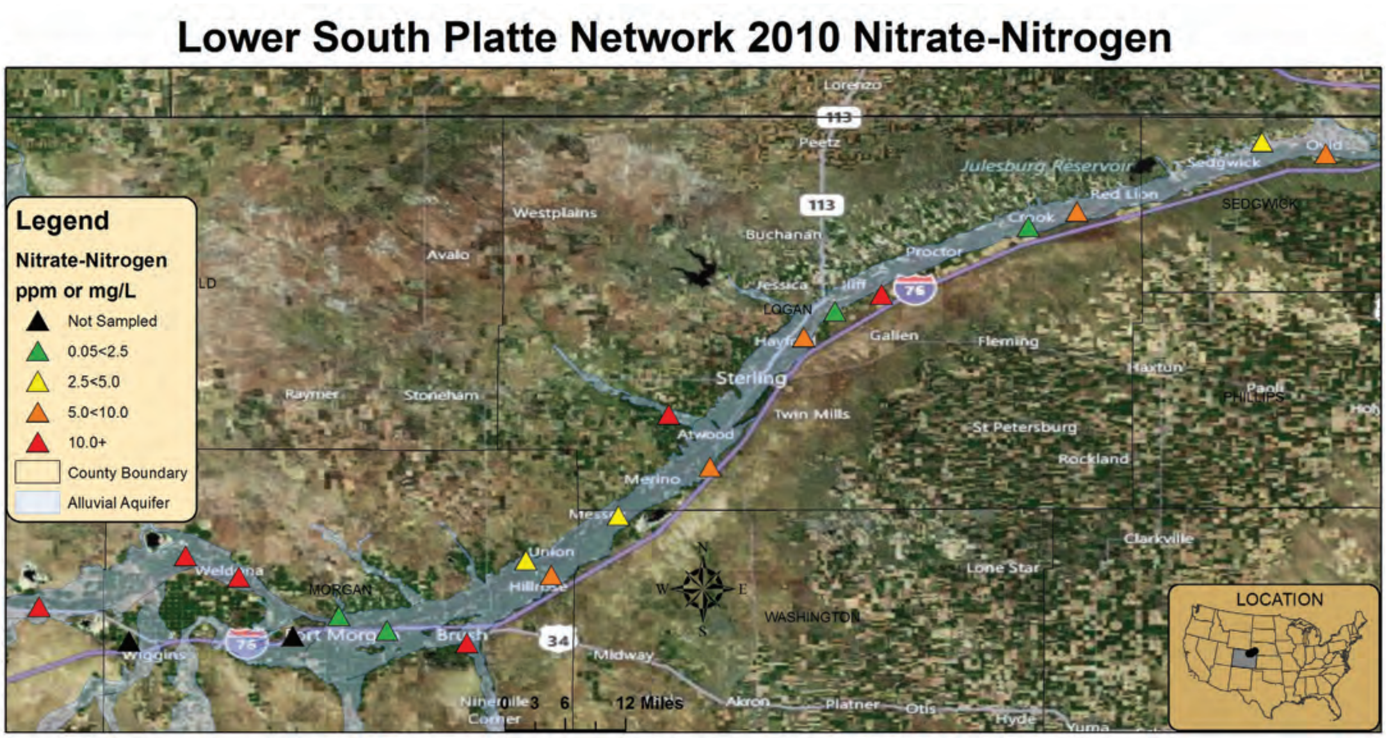

Figure 2. Map showing sample distribution and nitrate–nitrogen results for samples collected in 2010 from the Lower South Platte monitoring well network. Two wells not sampled due to no access or the well being dry. PPM is parts–per–million. mg/L is milligrams–per–liter.

Lower South Platte 2010 Pesticide Detections					
Pesticide	# Detects	Minimum	Median	Mean	Maximum
Metalaxyl	1	0.61			0.61
2,4-D	1	0.25			0.25
Acetochlor ESA*	1	0.26			0.26
Alachlor ESA*	7	0.14	0.48	0.59	1.46
Atrazine	1	0.1			0.1
Desethyl atrazine*	4	0.13	0.31	0.50	1.27
Hydroxy atrazine*	4	0.25	0.36	0.76	2.05
Bromacil	1	0.33			0.33
Imazapyr	1	0.11			0.11
Metolachlor ESA*	16	0.25	0.58	0.86	3.14
Metolachlor OA*	3	0.47	0.59	0.57	0.64
Picloram	1	2.27			2.27
	--------------- 6 Samples From Well 4 (Brush, CO) --------------				
Metalaxyl	6	0.21	0.54	0.46	0.62
Propazine	5	0.28	0.38	0.35	0.43
Alachlor ESA*	4	0.24	0.29	0.29	0.33
Atrazine	6	6.19	9.20	9.73	15.35
Desethyl atrazine*	4	1.06	1.19	1.22	1.43
Desisopropyl atrazine*	4	0.30	0.38	0.38	0.45
Hydroxy atrazine*	4	0.14	0.16	0.17	0.22
Bromacil	6	0.31	0.41	0.42	0.57
Diuron	6	0.34	0.50	0.49	0.64
Imidacloprid	2	0.28			0.44
Metolachlor ESA*	3	0.25	0.40	0.36	0.43

Table 2. Pesticides detected in Lower South Platte monitoring well samples collected in 2010. Results in upper part of the table do not include data from Well 4. Well 4 data is shown by itself in the bottom part of the table. Concentrations are parts–per–billion (ppb). Atrazine, 2,4–D, and picloram have EPA drinking water maximum contaminant levels of 3, 70, and 500 ppb, respectively. Bromacil has an EPA lifetime health advisory level of 90 ppb. '*' indicates a pesticide degradation product compound.

2010. Other wells near or above the EPA standard in 2001, all remained above the EPA standard in 2010 but the increase in concentration in the wells has only ranged from 1.1 to 4.6 ppm since 2001. As historically seen, concentrations are highest on the western side of the LSP network, as seen in the mapped results in **Figure 2**.

2010 Pesticide Results

An assortment of pesticide compounds were detected in the LSP network as a whole in 2010, as seen in **Table 2**. It is important to review the results for Well 4 (bottom of Table 2) apart from the LSP network as a whole (top of Table 2) because of the multiple samples collected from the well. This separation of data is also necessary due to the unusually high number of detections compared to other wells in the LSP.

In six sampling events a total of eleven different pesticide compounds were discovered with each sample containing six to ten pesticide compound detections. Metalaxyl, atrazine, bromacil, and diuron were detected every time. All six atrazine concentrations exceeded the EPA standard of 3.0 ppb ranging from 6.19 to 15.35 ppb. As seen in **Figure 3**, atrazine concentrations steadily rose during the first four measurements and then decreased in the last two indicating a potential plume of contaminated groundwater moving through the area. The ratio of desethyl–atrazine to atrazine (DAR)

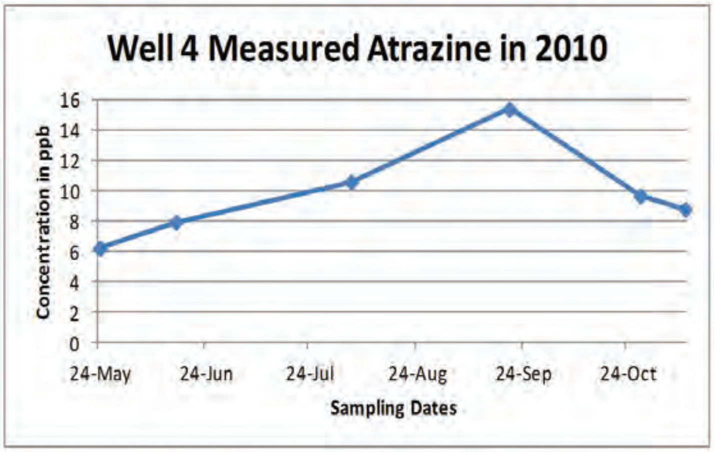

Figure 3. Line graph showing concentrations of the herbicide atrazine discovered over the course of six sampling events, in 2010, in Well 4 of the Lower South Platte network.

is a good indicator of whether contamination is a result of parent compound slowly leaching through a soil profile and being degraded versus migrating through quickly since atrazine has a typical soil half–life of 46 days. All Well 4 samples had DAR values less than one with two samples containing no detectable desethyl atrazine. This indicates that the parent compound had reached groundwater quickly and underwent very little degradation, suggesting a potential point source of contamination.

As can be seen in Table 2 a total of 50 detections were discovered the samples from Well 4, while the other wells in the network accumulated 41 total detections from a single sampling event. The most frequently detected pesticide compound was metolachlor ESA (ethane sulfonic acid), detected in 17 wells. Alachlor ESA was discovered in eight wells. Four wells contained five or more pesticide compounds with 80% of those detections being of degradation products. Nearly half of the detections in the whole network were of metolachlor ESA or OA (oxanilic acid) which is similar to the other networks sampled in Colorado, in 2010. Furthermore, with 68% of network samples consisting of atrazine and metolachlor compounds (including their degradation products), LSP results are similar to results in the South Platte River alluvial system in Weld County.

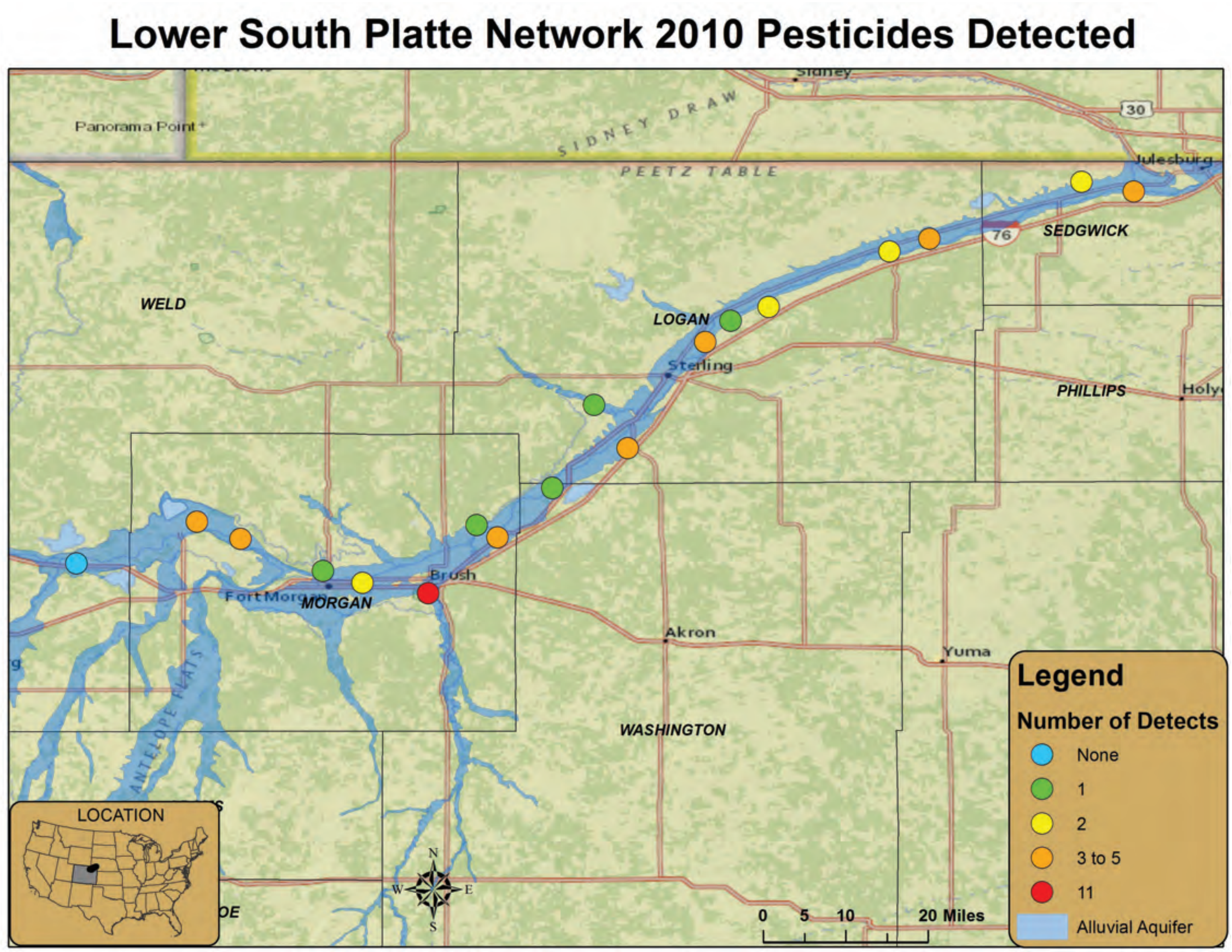

Figure 4. Map showing distribution of pesticide detections in monitoring wells of the Lower South Platte network sampled in 2010.

Other than detections of atrazine in Well 4, no pesticide concentrations were above an established EPA drinking water standard.

Figure 4 shows the distribution of pesticide detections in the Lower South Platte network for 2010. As discussed above Well 4 (red symbol in Figure 4) had the most variety and the highest concentrations of pesticide compounds. Seven other wells contained three to five detections, with atrazine or metolachlor degradation products accounting for most of those. Metolachlor ESA was the compound detected in wells with a single detection at concentrations ranging 0.25–0.81 ppb.

Unlike the results for nitrate concentrations which saw most of the higher concentrations on the west end of the network, pesticide concentrations and types are spread throughout the network. The multiple detections of metolachlor ESA shows that use of metolachlor products has occurred throughout the network. It is surprising that SP–M–30 on the west end of the network had no detectable pesticide compounds but yet contained nitrate–nitrogen above the EPA drinking water standard. This result demonstrates the complexity in interpreting groundwater quality results with respect to agrichemicals.

Summary

Nitrate concentrations in the LSP network have, for the most part, been consistent since sampling began in 2001. Results for 2010 showed one location (Well 4) with nitrate–nitrogen well above the EPA standard. The remainder of the LSP network had several other wells above the EPA standard with a maximum of 21.1 ppm. Nitrate concentrations seem to be highest in the western half of the network. Pesticide results are spread evenly throughout the network in 2010, with the exception of Well 4 which contained atrazine at concentrations five times the EPA standard of 3.0 ppb. Several other pesticide degradation products were discovered with metolachlor ESA showing up in 17 of 18 sampled wells. Degradation products accounted for 85% of the pesticides discovered which indicates a lot of degradation action is occurring, but not enough within the soil and geologic material above the water table to prevent contamination of the groundwater.

Fortunately, aside from Well 4, pesticide concentrations in the remainder of the network remain well below established EPA drinking water standards, at least for those pesticides that have them. This result can be somewhat misleading however given that very few pesticides have had the necessary studies conducted by EPA to determine whether a standard is necessary or not. Therefore, a detected pesticide with no EPA standard is likely no more desirable to consume from groundwater than from groundwater with a detection of a pesticide with a standard. It is not always well known what is good or bad with respect to most of the pesticides analyzed for, and sometimes detected, by the Program.

For questions or comments on this report, or the Program in general, please contact Rob Wawrzynski (303-239-5704, rob.wawrzynski@ag.state.co.us) or Karl Mauch (303-239-5713, karl.mauch@ag.state.co.us).

Table 3. Reporting limits of analytes tested for in 2010 by the Biochemistry Laboratory of the Colorado Department of Agriculture. Concentrations are in micrograms per liter (µg L^{-1}) for fungicide, herbicide, nematicide and insecticide analyte types. Concentrations for inorganic analytes are in milligrams per liter (mg L^{-1}).

Reporting Limits for Analytes Tested - Sampling Year 2010

Analyte	Tradename[1]	Use	Reporting Limit	Analyte	Tradename	Use	Reporting Limit
Nitrate as nitrogen (mg L^{-1})			0.05	3-Hydroxy carbofuran	Metabolite	Insecticide	0.25
Nitrite as nitrogen (mg L^{-1})			0.05	Halofenozide	Mach 2	Insecticide	0.10
Acetochlor	Harness	Herbicide	0.20	Halosulfuron methyl	Permit	Herbicide	0.10
Acetochlor (ESA)	Metabolite[2]	Herbicide	0.10	Hexazinone	Velpar	Herbicide	0.20
Acetochlor (OA)	Metabolite	Herbicide	0.25	Hydroxy Atrazine	Metabolite	Herbicide	0.10
Acifluorfen	Storm	Herbicide	0.10	Imazamethabenz methyl ester	Assert	Herbicide	0.10
Alachlor	Lasso	Herbicide	0.20	Imazamox	Raptor	Herbicide	0.10
Alachlor (ESA)	Metabolite	Herbicide	0.10	Imazapic	Plateau	Herbicide	0.10
Alachlor(OA)	Metabolite	Herbicide	0.10	Imazapyr	Arsenal	Herbicide	0.10
Aldicarb	Temik	Insecticide	0.50	Imazethapyr	Pursuit	Herbicide	0.10
Aldicarb sulfone	Metabolite	Insecticide	0.25	Imidacloprid	Admire	Insecticide	0.25
Aldicarb sulfoxide	Metabolite	Insecticide	0.10	Isoxaflutole	Balance	Herbicide	0.10
Aminopyralid	Milestone	Herbicide	0.50	Kresoxim methyl	Cygnus	Fungicide	0.25
Atrazine	Aatrex	Herbicide	0.10	Lindane	Gammexane	Insecticide	0.20
Azoxystrobin	Amistar	Fungicide	0.10	Linuron	Afalon	Herbicide	0.20
Bentazon	Basagran	Herbicide	0.50	Malathion	Malathion	Insecticide	0.20
Bromacil	Hyvar X	Herbicide	0.10	MCPA	MCPA	Herbicide	0.10
Carbofuran	Furadan	Insecticide	0.20	MCPP	Kilprop	Herbicide	0.10
Chlorantraniliprole	Durivo	Insecticide	0.10	Metalaxyl	Allegiance	Fungicide	0.20
Chlorimuron ethyl	Classic	Herbicide	0.25	Metconazole	Caramba	Fungicide	0.10
Chlorothalonil	Bravo	Fungicide	0.20	Methomyl	Lannate	Insecticide	0.10
Chlorsulfuron	Glean	Herbicide	0.10	Metolachlor	Bicep	Herbicide	0.20
Clopyralid	Lontrel	Herbicide	0.50	Metolachlor (ESA)	Metabolite	Herbicide	0.25
Cyanazine	Bladex	Herbicide	0.20	Metolachlor (OA)	Metabolite	Herbicide	0.25
Cyproconazole	Alto	Fungicide	0.10	Metribuzin	Lexone	Herbicide	0.20
Cyromazine	Larvadex	Insecticide	0.25	Metsulfuron methyl ester	Ally	Herbicide	0.10
2,4-D	Weed B Gone	Herbicide	0.10	Nicosulfuron	Accent	Herbicide	0.10
2,4-DB	Butyrac	Herbicide	0.50	Norflurazon	Solicam	Herbicide	0.20
DCPA	Dacthal	Herbicide	0.20	Picloram	Tordon K	Herbicide	0.50
Deethyl atrazine	Metabolite	Herbicide	0.10	Prometon	Pramitol	Herbicide	0.20
Deisopropyl atrazine	Metabolite	Herbicide	0.25	Propazine	Milo-Pro	Herbicide	0.20
Dicamba	Banvel D	Herbicide	0.50	Propoxur	Baygon	Insecticide	0.10
Dichlobenil	Casoron	Herbicide	0.20	Prosulfuron	Peak	Herbicide	0.25
Dichlorprop	Patron	Herbicide	0.10	Pyrimethanil	Distinguish	Fungicide	0.10
Diflufenzopyr	Distinct	Herbicide	0.10	Quinclorac	Drive	Herbicide	0.10
Dimethenamid	Frontier	Herbicide	0.10	Simazine	Primatol S	Herbicide	0.20
Dimethenamid (ESA)	Metabolite	Herbicide	0.25	Sulfentrazone	Spartan	Herbicide	0.50
Dimethenamid (OA)	Metabolite	Herbicide	0.50	Sulfometuron methyl ester	Oust	Herbicide	0.10
Dimethoate	Cygon	Insecticide	0.10	Sulfosulfuron	Certainty	Herbicide	0.10
Dinotefuran	Safari	Insecticide	0.20	Tebuconazole	Elite	Fungicide	0.10
disulfoton	Disyston	Insecticide	0.20	Tebufenozide	Confirm	Insecticide	0.10
disulfoton sulfone	Metabolite	Insecticide	0.20	Tebuthiuron	Graslan	Herbicide	0.10
disulfoton sulfoxide	Metabolite	Insecticide	0.20	Thiamethoxam	Cruiser	Insecticide	0.25
Diuron	Karmex	Herbicide	0.25	Triadimefon	Amiral	Fungicide	0.10
Ethofumesate	Solera	Herbicide	0.25	Triallate	Avadex BW	Herbicide	0.25
Ethoprop	Mocap	Insecticide	0.20	Triasulfuron	Amber	Herbicide	0.10
Fenamiphos	Nemacur	Nematicide	0.20	Trichlorfon	Dylox	Insecticide	0.20
Fenamiphos sulfone	Metabolite	Nematicide	0.20	Triclopyr	Garlon	Herbicide	0.50
Flufenacet	Axiom	Herbicide	0.10	Triticonazole	Charter	Fungicide	0.10
Flumetsulam	Broadstrike	Herbicide	0.10	Vinclozolin	Curalan	Fungicide	0.20

1 - Tradenames used are strictly examples of products containing a particular analyte and does not suggest analysis of a specific product.
2 - 'Metabolite' is a degradation product of a parent pesticide.