

Pesticide Testing in the City of Boise 2007 and 2008

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In 2007, the Idaho State Department of Agriculture (ISDA) Ground Water Program was awarded a grant by the Environmental Protection Agency (EPA) to test ground water for pesticides in areas of the state having little or no previous pesticide testing. The grant provided resources to conduct initial testing of pesticides at 24 wells in the city of Boise (Figure 1) including 16 privately owned domestic wells, seven city park irrigation wells, and one city golf course irrigation well. The testing was undertaken to develop a better understanding of impacts from urban lawn and tree care pesticides on the shallow aquifer system in Boise.

The hydrogeology in the study area has been divided into two aquifers: a shallow system and a deep system that are separated by a thick blue clay layer. This project focused on the water quality of the shallow system. The shallow system is called the Treasure Valley Shallow Aquifer and is composed of unconsolidated gravels and coarse grained sands of the Snake River Group (Neely and Crockett, 1998). Land use within the project area (i.e., residential, golf course, parks, etc.) was characterized utilizing information from the city of Boise (City of Boise, 2006). Domestic wells in residential areas and green spaces (parks, golf course, etc.) were targeted for this project.

In 2007, 16 privately owned domestic wells were sampled for 54 different pesticides that are registered in Idaho for urban uses. In 2008, seven city park irrigation wells and one city golf course irrigation well were tested for the same 54 pesticides as well as 14 additional pesticides labeled for urban uses. Nine wells of the 24 wells sampled (38%), had one or more pesticide detected in the ground water.

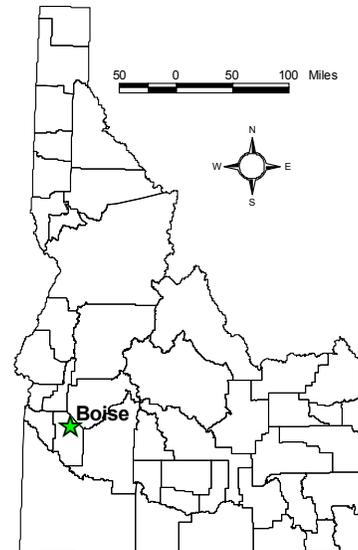


Figure 1. Location of Boise, Idaho.

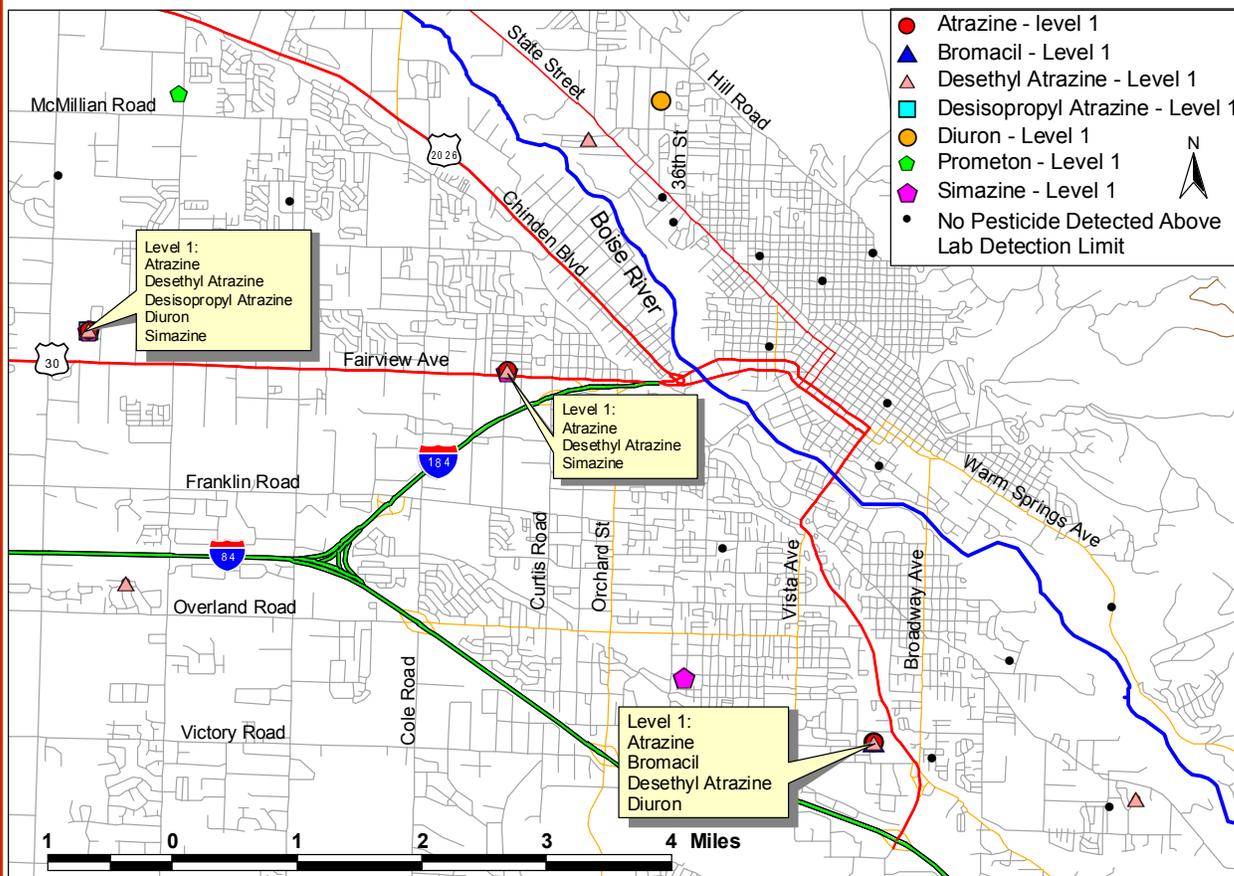


Figure 2. Pesticide results from ISDA 2007 and 2008 sampling of the Boise Urban Project.

Desethyl atrazine, a breakdown product of atrazine, was detected in six wells, or 25% of the wells sampled (Figure 2). Atrazine, diuron, and simazine were each detected in three wells. Bromacil, desisopropyl atrazine (breakdown product of atrazine or simazine), and prometon were detected in one well each. All detections were below any Idaho or EPA health standard and within the Level 1 category established by the Idaho PMP Rule (less than 20% of the associated health standard). All of the detections were found in privately owned domestic wells. No pesticides were detected in the city irrigation wells.

The pesticides detected in the Boise Urban Project are summarized in Table 1, along with common trade names and common non-agricultural use information.

Table 1. Summary of pesticides detected by ISDA 2007 and 2008 sampling of the Boise Urban Project.

Pesticide	No. of Detections out of 24 Wells	Range (µg/L)	Reference Point (µg/L)	Common Trade Names	Common Non-Agricultural Uses
Atrazine	3 (13%)	0.064 - 0.084	3 (MCL) ¹	Drexel [®] , Atrazine 90DF [®] , Aatrex Nine-O [®]	Systemic triazine herbicide labeled for use on golf courses, lawns and roadsides.
Bromacil	1 (4%)	0.39	70 (HAL) ²	Hyvar [®] X, Krovar [®] I DF, Barren [®]	Herbicide labeled for use on paved areas, storage yards, and right of ways for highway, pipeline, and railroad.
Deisopropyl Atrazine	1 (4%)	0.031	---- ³	---- ³	---- ³
Desethyl Atrazine	6 (25%)	0.035 - 0.093	---- ³	---- ³	---- ³
Diuron	3 (13%)	0.051 - 0.17	21 (RfD) ⁴	Krovar [®] I DF, Karmex [®] IWC	Herbicide labeled for use on fence rows, right of ways for highway, pipeline, and railroad.
Prometon	1 (4%)	0.3	100 (HAL)	Pramitol [®] , Sonora [®]	Non-selective bare-ground herbicide labeled for walks, driveways, graveled areas, parking lots, around buildings and recreational areas, patios, along fence rows, and curbs.
Simazine	3 (13%)	0.025 - 0.059	4 (MCL)	Pramitol [®] , Princep [®]	Chlorinated triazine selective herbicide registered for residential use on turfgrass, including both commercial use on recreational lawns (such as golf courses) and commercial or homeowner use on home lawns.

¹MCL – EPA Maximum Contaminant Level. ²HAL – EPA Lifetime Health Advisory Level. ³Breakdown product of Atrazine, MCL of 3 µg/L for atrazine is used.

⁴RfD – EPA Reference Dose.

The Boise City Parks and Recreation Department uses integrated pest management (IPM) as a strategy of dealing with weeds, insects, and other pests in the city parks. The active ingredients most commonly used on the city parks are 2,4-D, clopyralid, and triclopyr (Holt, 2008). None of these active ingredients were found in any of the wells. No pesticides were detected in any city park or golf course irrigation wells, which suggests the City of Boise Parks and Recreation Department IPM program is a success. The sample set of park irrigation wells was small (8 wells), but this data could be an indicator that turf maintenance at parks is not a ground water concern for pesticides if proper management is used.

Lawn and green space maintenance practices potentially contribute to the pesticide detections in the ground water in the City of Boise, such as applications to residential lawns, business properties, and recreation areas (golf courses, athletic fields, and parks). Roadside and other non-crop area application of pesticides are also potential sources of the pesticide detections. Some of the pesticide detections could potentially be the result of historic applications from agricultural practices in areas that have been converted from farm land to residential areas in southeast, southwest, and west Boise. However, with proper management strategy such as IPM, lawn care maintenance can be achieved without contamination of the ground water, as suggested by the data from the City of Boise park and golf course wells.

REFERENCES

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