Monitoring of Pesticides at WSSC

Montgomery County Water Quality Advisory Group Meeting

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Monitoring of Pesticides at WSSC

- WSSC regularly monitors for ~53 pesticides in the tap and source waters (monthly or quarterly)
- Reported annually in the Tap Water Analysis Reports (available on our website)
- Also, measured other pesticides for special monitoring studies and for the Unregulated Contaminants Monitoring Rule

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Regular Monitoring of Pesticides in Raw & Tap Water

1,2,3-Trichlorobenzene	Butachlor	Hexachlorobenzene
1,2,3-Trichloropropane	Carbaryl	Hexachlorocyclopentadiene
1,2-Dibromoethane (EDB)	Carbofuran	Lindane
1,3-Dichlorobenzene	Chlorate	Methiocarb
1,3-Dichloropropane	Chlordane	Methomyl
2,2-Dichloropropane	cis-1,3-Dichloropropene	Methoxychlor
2,4,5 TP (Silvex)	Dalapon *	Metolachlor
2,4-D	Dimethyl tetrachloroterephthalate	Metribuzin
2-Chlorotoluene	Dibromochloropropane (DBCP)	Nitrobenzene
3-Hydroxycarbofuran	Dicamba	Oxamyl (vydate)
Alachlor	Dieldrin	Paraquat
Aldicarb	Dinoseb	Pentachlorophenol (PCP)
Aldicarb sulfone	Diquat	Picloram
Aldicarb sulfoxide	Endothall	Propachlor
Aldrin	Endrin	Simazine
Atrazine	Glyphosate	Toxaphene
Baygon	Heptachlor	trans-1,3-Dichloropropene
Bromomethane	Heptachlor epoxide	

Regular Monitoring of Pesticides in Raw & Tap Water

Parameter	Frequency	EPA Limit (µg/L)	Detection Level (µg/L)
1,2,3-Trichlorobenzene	Monthly	n/a	0.5
1,2,3-Trichloropropane	Monthly	n/a	0.5
1,2-Dibromoethane (EDB)	Monthly	0.05	0.5
1,3-Dichlorobenzene	Monthly	n/a	0.5
1,3-Dichloropropane	Monthly	n/a	0.5
2,2-Dichloropropane	Monthly	n/a	0.5
2,4,5 TP (Silvex)	Quarterly	50	4
2,4-D	Quarterly	70	4
2-Chlorotoluene	Monthly	n/a	0.5
3-Hydroxycarbofuran	Quarterly	n/a	0.5
Alachlor	Monthly	2	1
Aldicarb	Quarterly	3	0.5
Aldicarb sulfone	Quarterly	2	0.5
Aldicarb sulfoxide	Quarterly	4	0.5
Aldrin	Monthly	n/a	1
Atrazine	Monthly	3	1
Baygon	Quarterly	n/a	0.5
Bromomethane	Monthly	n/a	0.5
Butachlor	Monthly	n/a	1
Carbaryl	Quarterly	n/a	0.5
Carbofuran	Quarterly	40	0.5
Chlordane	Monthly	2	1
cis-1,3-Dichloropropene	Monthly	n/a	0.5
Dalapon *	Quarterly	200	1
DCPA (Dimethyl tetrachloroterephthalate)	Quarterly	n/a	4
Dibromochloropropane (DBCP)	Monthly	0.2	0.01

Parameter	Frequency	EPA Limit (µg/L)	Detection Level (µg/L)
Dicamba	Quarterly	n/a	1
Dieldrin	Monthly	n/a	1
Dinoseb	Quarterly	7	4
Diquat	Quarterly	20	0.4
Endothall	Quarterly	100	20
Endrin	Monthly	2	1
Glyphosate	Quarterly	700	6
Heptachlor	Monthly	0.4	0.2
Heptachlor epoxide	Monthly	0.2	0.1
Hexachlorobenzene	Monthly	1	0.2
Hexachlorocyclopentadiene	Monthly	50	1
Lindane	Monthly	0.2	0.1
Methiocarb	Quarterly	n/a	0.5
Methomyl	Quarterly	n/a	4
Methoxychlor	Monthly	40	1
Metolachlor	Monthly	n/a	1
Metribuzin	Monthly	n/a	1
Nitrobenzene	Monthly	n/a	5
Oxamyl (vydate)	Quarterly	200	0.5
Paraquat	Quarterly	n/a	2
Pentachlorophenol (PCP)	Quarterly	1	0.8
Picloram	Quarterly	500	4
Propachlor	Monthly	n/a	1
Simazine	Monthly	4	1
Toxaphene	Quarterly	3	0.5
trans-1,3-Dichloropropene	Monthly	n/a	0.5

* Measured at tap only n/a – not applicable µg/L - equivalent of one minute in 2,000 years or one penny in $10 million.

Other special studies that monitored pesticides

- June 2002 - USGS/NASA - Herbicides, Pharmaceuticals, Wastewater Products, and Other Emerging Contaminants in Maryland and D.C.
  - Some herbicides measured at trace ppb level. Only measured source water. Regardless, no regulated human health maximum contaminant levels (MCLs) were violated.

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Other special studies – June 2002

Acetochlor	Flufenacet
Acetochlor ESA	Flufenacet ESA
Acetochlor OXA	Flufenacet OXA
Acetochlor SAA	Metolachlor *^
Alachlor *	Metolachlor ESA ^
Alachlor ESA ^	Metolachlor OXA ^
Alachlor OXA	Metribuzin *
Alachlor SAA	Pendimethalin
Ametryn	Prometon
Atrazine *^	Prometryn
Cyanazine	Propachlor *
Cyanazine amide	Propachlor EOXA
Deethylatrazine ^	Propachlor ESA
Deisopropylatrazine ^	Propazine
Dimethenamid	Simazine *^
Dimethenamide ESA	Terbutryn
Dimethenamide OXA	

** Continue to monitor monthly*

^ Detected at trace ppb levels

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Other special studies that monitored pesticides

- 2008 – MWCOG regional trace compounds study
  - 19 compounds selected and tested in source and tap water.
  - 4 pesticides studied: atrazine, lindane, linuron, methoxychlor. All but linuron continue to be monitored regularly.
  - Of the compounds tested, only 1 herbicide (atrazine) was detected.

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Other special studies that monitored pesticides

- UCMR 1 (Oct. 2001 – Aug. 2002)
  - Pesticides monitored quarterly for one year: Acetochlor, DCPA* mono acid, DCPA di acid, 4,4'-DDE, EPTC, molinate, nitrobenzene*, and terbacil

All Below Detection

**Continues to be monitored quarterly or monthly*

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Other special studies that monitored pesticides

- UCMR 2 (Jan-Oct. 2008)
  - Pesticides and degradates monitored quarterly for one year:

Dimethoate
Terbufos sulfone
Acetochlor
Alachlor
Metolachlor
Acetochlor ethane sulfonic acid (ESA)
Acetochlor oxanilic acid (OA)
Alachlor ethane sulfonic acid(ESA)
Alachlor oxanilic acid (OA)
Metolachlor ethane sulfonic acid(ESA)
Metolachlor oxanilic acid (OA)

All Below Detection

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Other special studies that monitored pesticides

- UCMR 3 (July 2013 - ongoing)
  - Pesticides monitored quarterly: 1,2,3-trichloropropane, bromomethane, and chlorate
  - **NO detection** of 1,2,3-trichloropropane and bromomethane.

    Very small concentration of chlorate - *detection limit of 20 µg/L; results between non-detect and 44 µg/L in 2014; USEPA Health Reference Level of 210 µg/L for chlorate*

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Summary of detections in 2014-2015

	Patuxent WFP Tap (µg/L)			Potomac WFP Tap (µg/L)			EPA Limit (µg/L)	Detection Limit (µg/L)
Parameter	**Annual Avg**	**Max**	**Min**	**Annual Avg**	**Max**	**Min**		
Atrazine	<1	1.66	n/d	n/d	<1	n/d	3	1
Chlorate	n/d	n/d	n/d	22	44	n/d	210 (HRL)	20
Dalapon	n/d	<1	n/d	n/d	<1	n/d	200	1
Metolachlor	n/d	<1	n/d	n/d	n/d	n/d	n/a	1
Simazine	<1	1.24	n/d	n/d	n/d	n/d	4	1

HRL – Health Reference Level, US EPA
n/a – not applicable
n/d – not detected
µg/L - equivalent of one minute in 2,000 years or one penny in $10 million.

Atrazine, metolachlor, and simazine monitored monthly. Chlorate and dalapon measured quarterly.

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