**Exposure Assessment Worksheet**

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| Chemical Name: | Oxyfluorfen | |
| [CAS number:](http://toxnet.nlm.nih.gov/index.html) | 42874-03-3 | |
| Review Type: | CEC |  |
| Nomination Info  (who/when/why) | MDH-HRA nominated due to presence on UCMR4 list and upcoming water monitoring results in 2019.  For CECs, refer to [nominations tracking table](file:///O:\ESA\ESA_Units_Programs\HRA\Guidance\Water\Screening\Nominations) (link is under “Date of Nomination.”)  Chemical status is in the [Chemical tracking Table.](file:///O:\ESA\ESA_Units_Programs\HRA\Admin\Tracking\ChemicalProjectTracking\) | |
| Exposure Score  (calculate [here](file:///O:\ESA\ESA_Units_Programs\HRA\Guidance\Water\Screening\ScoringRanking\Exp_ScreeningScoring\_Exposure%20Scoring%20Sheet.xlsx)) |  | |

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| **Some useful links:** | | |
| **General** | [PubMed (NIH/NLM)](http://www.ncbi.nlm.nih.gov/pubmed/) (search for journal articles)  [Google Scholar](https://scholar.google.com) (search for journal articles)  [EPA CompTox Chemistry Dashboard](https://comptox.epa.gov/dashboard/)—Fate/transport, exposure estimates, chemical uses, and more  [PubChem](https://pubchem.ncbi.nlm.nih.gov) (chemical data)  [ATSDR](http://www.atsdr.cdc.gov/) (Tox profiles, often include exposure information as well)  [TOXNET](http://toxnet.nlm.nih.gov/index.html) (Chemical data; go to HSDB for chemical properties and related info.)  EPA Clu-In fact sheets and info: <https://clu-in.org/>  EPA Federal Facility Contaminant Fact Sheets: https://www.epa.gov/fedfac/emerging-contaminants-and-federal-facility-contaminants-concern#706 | |
| **Physical/Chemical properties** | [TOXNET](http://toxnet.nlm.nih.gov/index.html) (Chemical data; go to HSDB for chemical properties and related info.)  NLM ChemID Plus (good for chemical identity and properties): <http://chem.sis.nlm.nih.gov/chemidplus/> | |
| **Chemical Use** | Pesticide registration status and documentation: <http://www.epa.gov/opp00001/reregistration/status.htm>  Pharmaceutical label information: <http://dailymed.nlm.nih.gov/dailymed/about.cfm>  Food additives: <https://www.accessdata.fda.gov/scripts/fdcc/?set=FoodSubstances>  Cosmetics and Fragrances: <http://www.cir-safety.org/> | |
| **Exposure Information** | USDA Pesticide Data Program (PDP) (pesticide data, including food residues): <http://www.ams.usda.gov/AMSv1.0/pdp> | |
| **Monitoring Data** | General  (also see section 4) | Occurrence studies by USGS and others: See [O:\ESA\ESA\_Units\_Programs\HRA\Resources\ExposureOccurenceReports](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports) |
| Pharmaceuticals | NOAA – monitoring of pharmaceuticals in the environment - <http://products.coastalscience.noaa.gov/peiar/> |
| Pesticides | MDA monitoring and Assessment of Agricultural Chemicals in the Environment (including annual monitoring reports): <https://www.mda.state.mn.us/pesticide-fertilizer/monitoring-assessment-agricultural-chemicals-environment> |
| **Release Information** | [EPA Toxics Release Inventory](http://www.epa.gov/triexplorer/) (industrial chemical releases) NOTE (Jan 2019) the popup window for selecting chemicals is glitchy. Only Firefox opened the window properly (regardless of popul settings) and it was necessary to reload the URL inside the popup top make the selection function work. | |

**1. Chemical Identity.**

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| **Chemical Synonyms** | IUPAC = 2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene; Benzene, 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)-; |
| **Chemical Uses** |  |
| **Industrial/Commercial** |  |
| **Agricultural** | Herbicide. |
| **Consumer (personal care)** |  |
| **Consumer (pharmaceutical)** |  |
| **Consumer (food)** |  |
| **Consumer (other)** | nonag herbicide uses for forestry, residential |
| **Are uses in Minnesota comparable to uses in other states?** | As tree, fruit, nut, and vine crops are listed before ‘field’ crops, use may be lower in Minnesota. Less than 1,000 pounds per year are sold according to MDA. |
| **Are there differences in consumer product use patterns by race and/or ethnicity?** | unknown |
| **1a. Any major new or expanded uses that could increase exposure? (recent or future changes)** | Sales data from MDA generally trending downward |
| **1b. Any anticipated decreases in exposure due to recent or upcoming decreased use or regulations/bans?** | None known. |
| **Production Data** | Sometimes available here: [EPA CompTox Chemistry Dashboard](https://comptox.epa.gov/dashboard/) |
| **Naturally Occurring?** | No |
| **Manufacturing** | None listed in MN on TRI inventory. |
| **Processing** | None in MN identified. |
|  |  |
| **Key messages for Information Sheet** | **Chemical Identity, Chemical Uses**  Oxyfluorfen is an herbicide used in both agriculture and non-agricultural settings. |
| **Potential Issues/Concerns or Unresolved Questions** |  |
| **Secondary Reviewer questions/observations** | (note any disagreements/additions/corrections) |

**2. Chemical Data.**

**(key source:** [**TOXNET/HSDB**](https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm)**)**

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| --- | --- | --- | --- | --- |
| **Parameter** | **Value** | **Units** | **Source** |  |
| **2.1 Koc (log)**  Low mobility : log Koc>4.  Medium :log Koc 2 to 4.  High : log Koc<2 | 3.95 | log | HSDB | Can be estimated from Kow : see below.  Discuss sorption to sludge/soil/sediment. |
| **2.11 Kow** | 4.73 | log | HSDB | Can estimate log Koc from log Kow using equation in Apdx B of EPA RSEI document: <http://www.epa.gov/opptintr/rsei/pubs/tech_app_b.pdf>  Equation on page B-4 (originally from Lyman et al 1990, Handbook of Chemical Estimation Properties):  **log (Koc) = 0.544 × log (Kow) + 1.377**   |  |  | | --- | --- | | **Enter log Kow below** | **Highlight # below and press F9 to calculate log Koc** | | **4.73** | **3.95** | |
| **2.2 Biodegradation half-life**  Low: <2 days  Medium: 2 days – 2 mos.  High: >2 months | 12 – 27 day half-lives listed on HSDB. | | | |
| **2.3 Soil/Water/Sed. half-life (abiotic)**  Low: <60 days  Medium: 60 – 180 days  High: >180 days | stable to hydrolysis. | | | |
| **2.4 Solubility in Water**  Negligible: <1e-3 mg/L  Low: 1E-3 to 1 mg/L  Medium: 1 to 1000 mg/L  High: >1000 mg/L | 0.116 | mg/L | HSDB |  |
| **2.5 Henry’s Law const.**  Nonvolatile (<3 E-7 atm m3/mol)  Low (3E-7 to 1E-5 atm m3/mol)  Mod. (1E-5 to 1E-3 atm m3/mol)  High (>1E-3 atm m3/mol) | 8.2  x10-7 | atm m3/mol | HSDB | **Volatility class: LOW** |
| **2.6 WWTP removal**  Low concern: >90%  Medium concern: 10 to 90%  High concern: <10% |  | | | |
| **Molecular weight** | 361.7 | g/mol |  |  |
| **2.7 Vapor Pressure**  Negligible: below 1E-08 mm Hg  Low: 1E-8 to 1E-4 mm Hg  Moderate: 1E-4 to 1 mm Hg  High: >1 mm Hg | 2.0  x10-7 | mm Hg | HSDB |  |
| **2.8 BCF**  Not bioaccum: <1000  Moderate: 1000-5000  High: >5000 | 880 (HSDB) | | | |
| **Breakdown Products** |  | | | |
| **Key messages for Information Sheet** | **Persistence and Mobility in the Environment**  Low solubility. Expected to be immobile in soil (HSDB), volatilization is not expected. Aquatic organism bioconcentration has high potential. Biodegradation in water may be important. | | | |
| **Potential Issues/Concerns or Unresolved Questions** |  | | | |
| **Secondary Reviewer questions/observations** |  | | | |

**3. Chemical Emissions and Disposal.**

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| **3.0. Key Data Sources.**  **WW=wastewater; DW=drinking water; SW=surface water; GW=groundwater.**  **Check any boxes that apply, then provide details in Sections 3.1, 4.1, 4.2, 4.3, and 4.4.**  **(NOTE some links below are broken due to the ongoing O drive reorganization. For the MDA-MPCA-USGS-EPA-NPS reports, look** [**here**](file:///\\DATA3FB\EH\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports)**.)** | **Checked?** | **3.1**  WW | **4.1** Finished DW | | **4.2** Source DW | | **4.3**  Non Source SW | **4.4**  Non Source GW |
| **Meta-databases** |  |  | **SW** | **GW** | **SW** | **GW** |  |  |
| USGS database ([Access db](file:///O:\HRA\COMMON\DWCEC\Special%20Projects\USGS%20Database%20part%20II); [field descriptions](file:///O:\HRA\COMMON\DWCEC\Special%20Projects\USGS%20Database%20part%20II\Deliverables%202-27-2018\CEC_Compilation_Update%20Feb%202018\ReferenceFile_Update%20Feb%202018.xlsx)) |  |  |  |  |  |  |  |  |
| [Water Quality Portal](http://waterqualitydata.us/portal/) (use [summarizer](file:///O:\ESA\ESA_Units_Programs\HRA\Guidance\Water\Screening\Templates\Occurrence%20data%20analysis) to calculate statistics) |  |  |  |  |  |  |  |  |
| [Water Quality Portal](http://waterqualitydata.us/portal/) (OUTSIDE MINNESOTA) |  |  |  |  |  |  |  |  |
| **Individual data sources** |  |  |  |  |  |  |  |  |
| [MNDWIS](file:///C:\Users\greenc1\Desktop\MNDWIS.lnk)\* (use the [summarizer](file:///O:\ESA\ESA_Units_Programs\HRA\Guidance\Water\Screening\Templates\Occurrence%20data%20analysis) to calculate max/mean) |  |  |  |  |  |  |  |  |
| UCMR 4 ([chem list](file:///\\\\data3fb\\eh\\ESA\\ESA_Units_Programs\\HRA\\Projects\\UCMRAnalysis\\UCMR4\\_UCMR4%20chem%20list.png)) ([data](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Projects\UCMRAnalysis\UCMR4\_UCMR4%20chem%20list.png)) **Oxyfluorfen is on UCMR 4** |  |  |  |  |  |  |  |  |
| UCMR 4 (OUTSIDE MN) |  |  |  |  |  |  |  |  |
| UCMR 3 ([chem list](file:///\\\\data3fb\\eh\\ESA\\ESA_Units_Programs\\HRA\\Projects\\UCMRAnalysis\\UCMR3\\_UCMR3%20chem%20list.xlsx)) ([data](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Projects\UCMRAnalysis\UCMR3\)) |  |  |  |  |  |  |  |  |
| UCMR 3 (OUTSIDE MN) |  |  |  |  |  |  |  |  |
| UCMR 2 ([chem list](file:///O:\\ESA\\ESA_Units_Programs\\HRA\\Resources\\ExposureOccurenceReports\\EPA\\UCMR\\UCMR%202\\UCMR2%20chemical%20list.png)) ([data](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\EPA\UCMR\UCMR%202\UCMR2%20chemical%20list.png)) |  |  |  |  |  |  |  |  |
| UCMR 2 (OUTSIDE MN) |  |  |  |  |  |  |  |  |
| UCMR 1 ([chem list](file:///O:\\ESA\\ESA_Units_Programs\\HRA\\Resources\\ExposureOccurenceReports\\EPA\\UCMR\\UCMR1\\ucmr1_list1and2chem_final.xls)) ([data](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\EPA\UCMR\UCMR1\ucmr1_list1and2chem_final.xls)) |  |  |  |  |  |  |  |  |
| UCMR 1 (OUTSIDE MN) |  |  |  |  |  |  |  |  |
| [MDA 2017 WQ Monitoring Report](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2017_WQMReport.pdf) |  |  |  |  |  |  |  |  |
| [MDA 2016 WQ Monitoring Report](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2016_WQMReport.pdf) |  |  |  |  |  |  |  |  |
| [MDA 2015 WQ Monitoring Report](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2015_WQMReport.pdf) |  |  |  |  |  |  |  |  |
| [MDA 2014 WQ Monitoring Report](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2014_WQMReport.pdf) |  |  |  |  |  |  |  |  |
| [MDA 2013 WQ Monitoring Report](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2013_WQMReport.pdf) |  |  |  |  |  |  |  |  |
| [MDA 2012 WQ Monitoring Report](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2012_WQMReport.pdf) |  |  |  |  |  |  |  |  |
| [MDA-MDH 2015 Recon Study Community Public Water Supply Wells](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA-MDH_2015_ReconPublicWellsStudy.pdf) |  |  |  |  |  |  |  |  |
| [MDA 2014 Pesticides Lakes](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MDA\MDA_2014_PesticidesLakesReport.pdf) |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| [MPCA 2017 Pharms and Chems of Concern in Rivers](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2017_PharmaCECsInRivers_OccurBiologEffects.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2015 Pharms PCPs and EAC Monitoring Lakes and Rivers 2013](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2015_PharmPCPsEDCs_MonitoringInLakesRivers.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2013 Pharms PCPs Rivers and Streams 2010](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2013_PharmaPCPs_MonitoringRiversStreams.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2013 Pharms and EACs in Lakes](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2013_PharmaEDCs_MonitoringLakes.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2013 Condition of MN Groundwater 2007-2011](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\AmbientGroundwater\MPCA_2013_ConditOfMNGW_2007-2011.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2012 EACs and CECs in MN Groundwater 2009-2010](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\AmbientGroundwater\MPCA_2012_EDCsCECsInMinnGW_2009-2010.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2012 EAC Monitoring MN Lakes 2009-2011](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2012_EDCs_MN%20LakeStudy.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2011 WWTP EDC Mon Study](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2011_WWTPandEDCsMonitoring%20Study.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2010 WWTP EDC Mon Study](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2010_EDCsInWWTP\MPCA_2010_EDCsInWWTP.pdf) (link to [data](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2010_EDCsInWWTP\MPCA_2010_EDCsInWWTP_DataReport.pdf)) |  |  |  |  |  |  |  |  |
| [MPCA 2010 Statewide EDC Mon Study 2007-2008](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2010_StatewideEDCMonitoring_2007-2008.pdf) |  |  |  |  |  |  |  |  |
| [MPCA 2008 EDCs Report to Legislature](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\MPCA\MPCA_Reports\SurfaceWater\MPCA_2008_EDCsInMNforLeg.pdf) |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| [National Park Service 2017 Regional Assessment of CECs](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\NationalParkService\Elliott&VanderMeulen_2017_RegionalAssessOfCECsMidwestNationalParks.pdf) |  |  |  |  |  |  |  |  |
| [National Park Service 2015 CECs National Parks](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\NationalParkService\VanderMeulen_2015_CECsSWinNPs.pdf) |  |  |  |  |  |  |  |  |
| [National Park Service 2013 Analytical Report](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\NationalParkService\NPS_2013_AnalyticalResultsMNStudy.pdf) (and [summary stats](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\NationalParkService\2013_NPSStudy_DetectioSummary.xlsx)) |  |  |  |  |  |  |  |  |
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| [EPA/USGS DWTP study 2017](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\EPA\EPA_USGS%20DWTP%20study\) (multiple documents) |  |  |  |  |  |  |  |  |
| [USGS SIR2014-5154 Overview Pesticides Streams Rivers USA 1992-2011](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\USGS\USGS_Reports\USGS_2014_ComparPestMonitInStreamsRivers_1992-2011.pdf) |  |  |  |  |  |  |  |  |
| [USGS SIR2014-5139 Organics in Source Water USA 2002-2010](file:///O:\\ESA\\ESA_Units_Programs\\HRA\\Resources\\ExposureOccurenceReports\\USGS\\USGS_Reports\\USGS_2014_OrganicsSWinCWSs2002-2010.pdf) |  |  |  |  |  |  |  |  |
| [USGS SIR2014-5135 Pesticide Trends US Rivers 1992-2010](file:///O:\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\USGS\USGS_Reports\USGS_2014_PesticidesUSWaters1992-2010.pdf) |  |  |  |  |  |  |  |  |
| [USGS SIR2011-5229 WQ Asmt Aquifers Northern Midwest](file:///O:\\ESA\\ESA_Units_Programs\\HRA\\Resources\\ExposureOccurenceReports\\USGS\\USGS_Reports\\USGS_2011_WQAssessOfCambrianAquiferInNorthMidWest.pdf) |  |  |  |  |  |  |  |  |
| [USGS (2013) DS878 Pharms shallow GW Minnesota](file:///\\data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\USGS\USGS_Reports\USGS-MPCA_2013_PharmaShallowGWNonAg) |  |  |  |  |  |  |  |  |
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| Also check for data submitted with the nomination. See link provided in the [nominations tracking table](file:///O:\ESA\ESA_Units_Programs\HRA\Guidance\Water\Screening\Nominations) (link is under “Date of Nomination.”) |  |  |  |  |  |  |  |  |

\* *As of May 2017, MNDWIS will truncate Excel outputs to 16,384 rows. If your data set is longer, you will need to split it up by date into sections that are each less than 16,383 records (plus one row for the headers.) UPDATE Fall 2018—this appears to have been fixed without any announcement, but you should continue to check your outputs.*

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| **3.1 Wastewater Conc.**  Low: <1 ug/L (effluent)  Medium: 1 to 10 ug/L (effluent)  High: >10 ug/L (effluent)  no data  **3a. WW detection frequency (MN)**  Zero: no known detections  Low: 0%<freq< 20%  High: ≥20%  no data  **3b. WW detection freq. (non MN)**  Zero: no detections  Low: 0%<freq< 25%  High: ≥25%  no data | **[USGS db codes WI (untreated) and WE (treated)]** |
| **Landfill Leachate: [USGS db code LFLCH]** |
| **Feedlot Lagoons: [USGS db code FLLAG]** |
| **Storm Sewer: [USGS db code FA-STS]**  **36 FA-STS, 35 non-detect (0.5 ug/L threshold), one sample with remark code “E” and results lower than other detection threshold (0.147 ug/L listed).** |
| **3.2 Down-the-Drain Disposal**  Low: <10,000 lbs/yr  Medium: 10,000-1M lbs/yr  High: >1M lbs/yr |  |
| **3.3 Landfill disposal**  Low: <10,000 lbs/yr  Medium: 10,000-1M lbs/yr  High: >1M lbs/yr |  |
| **3.4 Pesticide/fertilizer Releases to Land**  Low: <1,000 lbs/yr  Medium: 1,000-10,000 lbs/yr  High: >10,000 lbs/yr | Over 1,000 pounds used in 2012, less than 1,000 pounds in all following years. Highest use 1998 = ~27,000 pounds.  Is there a trend up or down in recent years? Down. |
| **3.5 Pesticide/fertilizer Releases to Water**  Low: <1,000 lbs/yr  Medium: 1,000-10,000 lbs/yr  High: >10,000 lbs/yr | Low solubility plus high affinity for soil is reason for marking ‘low’ here. |
| **3.6 Industrial Releases to Water**  **(Mfg., Processing, or Use)**  Low: <100 lbs/yr PER SITE  Medium: 100-1000 lbs/yr PER SITE  High: >1000 lbs/yr PER SITE | No data. Likely in low category? |
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**4. Chemical Occurrence in Environment, Drinking Water, and Food.**

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| **4.1 Finished Drinking Water**  Low: <0.01 ug/L  Medium: 0.01 – 1 ug/L  High: >1 ug/L  no data  **4a. DW detection frequency (MN)**  Not present: 0%  Low: 0%<freq<5%  High: ≥5%  no data  **4b. DW detection freq. (non MN)**  Not present: 0%  Low: 0%<freq<10%  High: ≥10%  no data | **Minnesota [USGS db codes DWF-SW (finished water-surface) and DWF-GW (finished water-ground)]**  **12 DWF-GW samples, all non-detect (0.5 threshold)**  **156 samples in MNDWIS, all non-detect (RL 0.5 ug/L)** | |
| **Outside Minnesota**  **(In general, non-MN data are only needed if there is little or no Minnesota data.)**  UCRM4 will be gathering data here. | |
| **4.2 Pretreatment Source Water**  **(Groundwater or Surface)**  Low: <0.01 ug/L  Medium: 0.01 – 1 ug/L  High: >1 ug/L  no data  **4c. PTSW detection frequency (MN)**  Not present: 0%  Low: 0%<freq<5%  High: ≥5%  no data  **4d. PTSW detection freq. (non MN)**  Not present: 0%  Low: 0%<freq<10%  High: ≥10%  no data | **Minnesota [USGS db codes DWR-SW (source water-surface) and DWR-GW (source water-ground)]** | |
| **Outside Minnesota**  **(In general, non-MN data are only needed if there is little or no Minnesota data.)**  USGS, 2014 Anthropogenic Compound Study has 221 samples in groundwater, 128 surface water, all nondetects. | |
| **4.3 Non-Source Surface Water**  Low: <0.01 ug/L  Medium: 0.01 – 10 ug/L  High: >10 ug/L  **4e. SW detection frequency (MN)**  Not present: 0%  Low: 0%<freq<10%  High: ≥10%  no data  **4f. SW detection freq. (non MN)**  Not present: 0%  Low: 0%<freq<15%  High: ≥15%  no data | **Minnesota USGS db codes:**   |  |  | | --- | --- | | **LK** | **Sample collected from a lake** | | **LKDW** | **Sample collected from a lake with a nearby wastewater effluent discharge** | | **ST** | **Sample collected from a stream** | | **STRDW** | **Sample collected from a stream intentionally located downstream of wastewater effluent discharge** |   2 STRDW samples, non-detect at 0.01 threshold | |
| **Outside Minnesota**  **(In general, non-MN data are only needed if there is little or no Minnesota data.)** | |
| **4.4 Non-Source Groundwater**  Low: <0.01 ug/L  Medium: 0.01 – 10 ug/L  High: >10 ug/L  **4g. NSGW detection frequency (MN)**  Not present: 0%  Low: 0%<freq<5%  High: ≥5%  no data  **4h. NSGW detection frequency**  **(non MN)**  Not present: 0%  Low: 0%<freq<5%  High: ≥5%  no data | **Minnesota USGS db codes:**   |  |  | | --- | --- | | **GW** | **Sample collected from groundwater** | | **GWCS** | **Sample collected from groundwater underlying an urban residential area served by a central sewer system** | | **GWFL** | **Sample collected from groundwater underlying feedlot** | | **GWIC** | **Sample collected from groundwater underlying urban/industrial/commercial land use** | | **GWISTS** | **Sample collected from groundwater in individual septic system drain field** | | **GWLF** | **Sample collected from groundwater underlying landfill or dump** | | **GWSR** | **Sample collected from groundwater underlying an urban residential area served by individual septic systems** | | **GWUN** | **Sample collected from groundwater underlying an undeveloped area such as a forest or park within an urban area** | | |
| **Outside Minnesota**  **(In general, non-MN data are only needed if there is little or no Minnesota data.)** | |
| **4i. USGS Tier (WATER)**  Tier 1  Tier 2  Tier 3  Not Rated  Not on List | Tier 1  Is the chemical a USGS Tier 1, 2, or 3 chemical for water? ([link to database](file:///\\Data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\USGS\USGS_Reports\USGS_2012_PriorityMonitoringWaterSedimentTiers\USGS_2012_NTASdatabase.xlsx))  (This is used for screening/ranking.) | |
| **4j. USGS Tier (SEDIMENT)**  Tier 1  Tier 2  Tier 3  Not Rated  Not on List | Tier 1  Is the chemical a USGS Tier 1, 2, or 3 chemical for sediment? ([link to database](file:///\\Data3fb\eh\ESA\ESA_Units_Programs\HRA\Resources\ExposureOccurenceReports\USGS\USGS_Reports\USGS_2012_PriorityMonitoringWaterSedimentTiers\USGS_2012_NTASdatabase.xlsx))  (This is used for screening/ranking.) | |
| **Minnesota Groundwater** | **Looked for? Yes** | **This is included for HRL Rule requirements. Groundwater studies are described above, under source water or non-source groundwater.**  **(Add comments here if necessary, i.e., refer back to GW detections reported above)** |
| **Detected? No** |
| **Air and Dust** |  | |
| **Food** | Could be found as residue on food products (fruits, nuts, vines). | |
| **Soil/Sediment** |  | |
| **Sludge/Biosolids** |  | |
| **Key messages for Information Sheet** | **Environmental Detections in Minnesota**  Rarely found in water in Minnesota. Little agricultural use in Minnesota. Seems very unimportant for Minnesota.    **Environmental Releases**    **Exposure Routes**  No evidence that drinking water is an exposure route in Minnesota. | |
| **Potential Issues/Concerns or Unresolved Questions** |  | |
| **Secondary Reviewer questions/observations** |  | |

**5. Human Exposure.** For each item, briefly summarize available data. For spaces in the table left blank, explain where you looked and indicate that no data were found.

|  |  |
| --- | --- |
| **Exposure Screening** | **Screening Assessment of *Exposure Potential***  **5a:** **Presence in consumer products**  Known: Reliable data indicating intentional use in consumer products (taken internally, applied to body, or present in the home environment). Some possible sources: [HSDB](http://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm), IUR, [NLM household products database](http://householdproducts.nlm.nih.gov/index.htm), or other (by design or as a contaminant)  Possible: Less conclusive information on presence in consumer products at home.  Unlikely: Looked for in consumer products, but not found. ***Skip to step 5c.***  No information found. ***Skip to step 5c.***  **5b: Individual direct exposure potential – Consumer products**  Known: Reliable data indicating that exposure occurs; deliberate intake via ingestion, inhalation or dermal contact > 1 hr.  Possible: VP>1 mm Hg; Solubility > 1000 mg/L; dermal contact 3 min to 1 hour  Unlikely: VP<1 mm Hg; water solubility<1000 mg/L; skin contact <3 min  **5c: Present in food or drinking water**  Known: Reliable data indicating deliberate use in food, food contact applications, or drinking water. Sources: FDA [Substances Added to Food (formerly EAFUS)](http://www.accessdata.fda.gov/scripts/fcn/fcnnavigation.cfm?rpt=eafuslisting); also see [FDA Food Additive Status List](https://www.fda.gov/Food/IngredientsPackagingLabeling/FoodAdditivesIngredients/ucm091048.htm)  Possible: data from HSDB, IUR, NLM household products database, or other sources indicating presence in food or drinking water (by design or as a contaminant)  Unlikely: Looked for in food/drinking water, but not found.  No information found.  **5d: Individual exposure potential – Food/Drinking Water**  If presence in food/DW (5c) is known or possible, consumption is assumed.  If presence in food/DW (5c) is unlikely or “no information,” consumption is not assumed.  **Screening Assessment of *Measured Human Exposures***  **5e: General population (non-occupational) exposure measurements**  1. Detected in [NHANES](https://www.cdc.gov/exposurereport/) or other biomonitoring studies? [PubMed (NIH/NLM)](http://www.ncbi.nlm.nih.gov/pubmed/)  2. [Biomonitoring California](https://biomonitoring.ca.gov/chemicals/chemical-index): *Designated Chemical* (link goes to index for all 3 CA lists)  3. Biomonitoring California: *Priority Chemical*  4. Biomonitoring California: *“Chemicals Monitored” list*  5. CDC: [National Biomonitoring Study](http://www.cdc.gov/biomonitoring/biomonitoring_summaries.html)  6. [temporarily removed outdated data element (VCCEP)]  7. EPA [“Safer Ingredients”](https://chemview.epa.gov/chemview) list (go to link and select “safer chemical ingredients list” under Chemical Group to see list) |
|  |  |
|  |  |
| **Exposure Assessment** | (not a priority during screening, but add any info if found during screening.) |
| **Tested in the human body? (blood, urine, etc.)** |  |
| **Has exposure been measured or estimated?**  **Dermal**  **Inhalation**  **Drinking Water**  **Food**  **Incidental Ingestion** |  |
| **Have average daily doses been estimated?** | Chemistry Dashboard has exposure estimates listed. |
| **Relative Source Contribution** | (based on available estimates of exposure, is the “standard” RSC of 0.2 & 0.5 a reasonable assumption?)  (This section is completed during full review, not during screening.) |
| **Are there any populations (children, elderly, etc.) who are a special concern for this chemical?** |  |
|  |  |
| **Key messages for Information Sheet** | **Drinking Water Concerns**  None. But UCMR4 may find detections that change this current estimation.  **Risk Potential from Known Exposures**  **How to Reduce Exposure** |
| **Secondary Reviewer questions/observations** | (note any disagreements/additions/corrections) |

**6. Review History and Contacts**

|  |  |
| --- | --- |
| **Screening Reviewer, Date** | James Jacobus, April 9, 2019 |
| **Primary Reviewer, Date** |  |
| **Secondary Reviewer, Date** |  |
| **MDH staff with an interest in this chemical** | Unknown. |
| **MDH and other state agency staff with information on this chemical** | MDA/Raj? |
| **Other state agencies to be contacted** | MDA would be an interested party. |
| **Potential MDH actions for this chemical** | Possible full review by CEC Initiative. |
| **Record of contacts** | (keep a list of correspondence, items that need follow-up, questions asked, etc.) |

[PubMed (NIH/NLM)](http://www.ncbi.nlm.nih.gov/pubmed/)

**References**

(Common references listed; add others as needed)

Hazardous Substances Data Bank. 2019. Results for “Oxyfluorfen.” From https://toxnet.nlm.nih.gov/cgi-bin/sis/search2/f?./temp/~yso6Da:1 Accessed 4/9/2019.

Minnesota Drinking Water Information System (MNDWIS). 2019 Accessed by MDH staff May, 2019.

National Water Quality Monitoring Council. 2016. Water Quality Portal (https://www.waterqualitydata.us). Accessed April, 2019.

U.S. Environmental Protection Agency. Chemistry Dashboard. https://comptox.epa.gov/dashboard/DTXSID7024241 (accessed Apr 9th, 2019), Oxyfluorfen