

# ATTACHMENT ONE

## Permethrin in Clothing Wastewater Load Estimates

### Pretreated clothing available at outdoor stores

Estimate for first and second wash only, based on information provide by U.S. EPA

#### Amount applied

Information from U.S. EPA: Adult men clothing light 1.61 g, heavy 5.4 g permethrin per clothing item  
This would be about the typical amount of fabric for one adult shirt or one pair of adult pants.

|                              |            |
|------------------------------|------------|
| Clothing a.i. amount (light) | 1.61 grams |
| Clothing a.i. amount (heavy) | 5.4 grams  |

#### Wash-off rate

From U.S. EPA: 33% of a.i. removed in first wash, 6% of remaining a.i. removed in second wash.

|                            |              |
|----------------------------|--------------|
| Loss in first wash, light  | 0.531 grams  |
| Loss in first wash, heavy  | 1.78 grams   |
| Loss in second wash, light | 0.0647 grams |
| Loss in second wash, heavy | 0.217 grams  |

#### Wastewater treatment plant removal

No data available on POTW removals, so used data from wastewater treatment at pesticide manufactures.

Three manufacturers using granular activated carbon and resin adsorption had removals of 52%, 75%, and 94%.

Average removal was therefore taken as 74%.

|                    |                          |
|--------------------|--------------------------|
| Light, first wash  | 0.138 grams in effluent  |
| Heavy, first wash  | 0.463 grams in effluent  |
| Light, second wash | 0.0168 grams in effluent |
| Heavy, second wash | 0.0564 grams in effluent |

#### Water quality criteria

From California Department of Fish & Game, calculated with standard U.S. EPA methods

|             |           |
|-------------|-----------|
| Fresh Water | 0.03 ppb  |
| Salt Water  | 0.001 ppb |

#### Weight of a million gallons of water

|                 |                  |
|-----------------|------------------|
| Million gallons | 8345300 Pounds   |
| Million gallons | 3785364656 grams |

#### Amount of permethrin to get 1 million gallons to water quality criteria

|             |               |
|-------------|---------------|
| Fresh Water | 0.114 grams   |
| Salt Water  | 0.00379 grams |

#### Estimated million gallons of wastewater effluent brought to water quality criteria from laundering one garment

Assumes no other sources of permethrin in wastewater.

|                    | Fresh Water | Salt Water          |
|--------------------|-------------|---------------------|
| Light, first wash  | 1.2         | 36 million gallons  |
| Heavy, first wash  | 4.1         | 122 million gallons |
| Light, second wash | 0.15        | 4.4 million gallons |
| Heavy, second wash | 0.50        | 15 million gallons  |

#### Estimated frequency of clothing items washed to exceed water quality criteria

Assumes 100 gallons per person per day of wastewater produced.

Assumes no other sources of permethrin in wastewater.

Assumes no dilution credit on POTW effluent.

|                    | Fresh water               |               |
|--------------------|---------------------------|---------------|
| Light, first wash  | 1 item washed per day per | 12,164 people |
| Heavy, first wash  | 1 item washed per day per | 40,799 people |
| Light, second wash | 1 item washed per day per | 1,482 people  |
| Heavy, second wash | 1 item washed per day per | 4,970         |

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|                    |                           |                  |
|--------------------|---------------------------|------------------|
| Salt Water         |                           |                  |
| Light, first wash  | 1 item washed per day per | 364,927 people   |
| Heavy, first wash  | 1 item washed per day per | 1,223,977 people |
| Light, second wash | 1 item washed per day per | 44,455 people    |
| Heavy, second wash | 1 item washed per day per | 149,103          |