TABLE OF CONTENTS

1 OVERVIEW 1
FORMATION 1
BOARD 1
OPERATION 1
CONTROL POLICY 1
OBJECTIVES 1

2 1999 BOARD OF TRUSTEES 2

3 1999 MOSQUITO CREW 2

4 ANNUAL BUDGET 3

5 NARRATIVE REPORT 4

5.1 General Mosquito Issues 4

5.2 Complaints 4

5.3 Education 4

5.4 Retention Ponds 4

5.5 Future Project 4

6 MOSQUITO CITIZEN COMPLAINTS 5

7 1999 COMPLAINT STATISTICS 6

8 CONTROL AGENTS 7

8.1 History 7

8.2 Clark County Today 7

9 GENERAL INFORMATION 9

9.1 Mosquito Control In and Around the Home 9

9.2 Premise Control 10

9.3 Mosquito Trivia 11

10 MOSQUITO INFORMATION AND REPORTING COMPLAINTS 12

10.1 Web Sites 12

10.2 Reporting Mosquito Complaints 12

10.3 How To Contact Us 12

1 Overview

FORMATION

Chapter 17.28 revised Code of Washington State sets the procedures for formation and operation of a Mosquito Control District. The Clark County Mosquito Control District includes all of Clark County and was formed by the voters at the General Election on November 1982 by a 63.8% favorable vote.

BOARD

Board of Trustee members are appointed by each city, and three are appointed by the County Commissioners for the county at large.

OPERATION

The Board of Trustees establishes policy, prepares and establishes the annual budget, and approves expenditures for the Mosquito Control District. The Board contracts with Southwest Washington Health District for operation of the control activities. Southwest Washington Health District is located at:

P.O. Box 1870
Vancouver, Washington 98668
1950 Fort Vancouver Way
Vancouver, Washington 98663
Telephone: (360) 397-8428

CONTROL POLICY

The Board of Trustees has an adopted control policy to control the mosquito population while striving to use organic control methods which will have the least adverse effect on people, wildlife, and the environment. A great deal of progress has been made to use control agents specific to mosquitoes. A copy of the complete adopted policy is available upon request.

OBJECTIVES

Primary objective of mosquito control:
To provide a means of controlling mosquito-borne illness transmission through reduction of the Clark County mosquito population.

Secondary objectives are:
1. Freedom from mosquito annoyance in homes and workplaces.
2. Increased efficiency of employees in outdoor occupations.
3. Increased use and enjoyment of outdoor recreational activities.

2 1999 Board of Trustees

Position	Name	Jurisdiction
President	Martin Anderson	District 1 – Commissioner Morris
Vice-President	Mark Rees	District 3 – Commissioner Pridemore
Secretary/Treasurer	Dean Lindgren	City of Washougal
	Bill Barnhart	City of La Center
	Jack Burkman	City of Vancouver
	Michael Macy	District 2 – Commissioner Stanton
	Raul Moreno	City of Ridgefield
	Debra Smith	Town of Yacolt
	Woody Woodruff	City of Camas
Staff Assistants	Louis A. Dooley, R.S. MPH	Southwest Washington Health District
	Sandi Brownell	Southwest Washington Health District
	Steve Kessler	Mosquito Crew Supervisor

3 1999 Mosquito Crew

1999 total man-hours – 4,394

Crew Supervisor: Steve Kessler

1. Sam Adams
2. Chris Lines
3. Jim Martin
4. Ken McMillan
5. Duane Schuman
6. Chuck Skov
7. Dale Smith
8. Warren Wyant

4 Annual Budget

BUD 1P *2000 Budget Planning*

Organization: SW WASHINGTON HEALTH DISTRICT
Division: ENVIRONMENTAL HEALTH SERVICES
Program: MOSQUITO CONTROL
Program # 6540-302-880-562-550-xxx

LINE ITEM:		1998 6 Mo. Actual	1998 Yr-End Actual	1999 BUDGET	1999 6 Mo. Actual	1999 End of Yr. Est.	2000 BUDGET	PERCENT DIFF.
110	Salaries	15,425	28,705	19,886	11,002		19,320	-2.85%
120	Part-Time Salaries	29,161	52,136	66,511	36,149		68,200	2.54%
199	Premium	-	-	-	-		-	
***Subtotal* - Salary**		44,586	80,841	86,397	47,151		87,520	1.30%
210	Fringe	6,544	11,956	13,717	6,538		13,331	-2.81%
***Subtotal* - Fringe**		6,544	11,956	13,717	6,538		13,331	-2.81%
***Subtotal* - Personnel Costs**		51,130	92,797	100,114	53,688		100,851	0.74%
315	Supplies: Office	151	460	363	71		292	-19.56%
318	Purchases < $5,000	-	-	1,294	-		1,347	4.10%
322	Laundry	-	-	-	-		-	
323	Drugs, Chemicals, Biologicals	-	-	10,600	3,246		13,600	28.30%
329	Supplies: Operating	11,285	12,137	2,200	5,540		2,310	5.00%
351	Minor Equipment & Tools	1,566	1,566	1,294	-		1,347	4.10%
362	Gasoline	37	1,290	2,368	334		2,486	4.98%
***Subtotal* - Supplies**		13,039	15,452	18,119	9,192		21,382	18.01%
415	Printing & Reproduction	76	114	211	110		174	-17.54%
416	Data Processing	-	-	-	-		-	
417	Temporary Services	-	-	1,035	-		1,090	5.31%
419	Fees for Service	352	6,128	23,000	-		36,490	58.65%
421	Communications	194	719	711	165		212	-70.18%
422	Postage	260	339	184	22		107	-41.85%
433	Travel: Local	18	112	400	51		420	5.00%
444	Sub-Agent Advertising	45	155	200	78		210	5.00%
454	Rentals: Buildings	528	1,011	808	416		716	-11.39%
455	Rentals: Equipment	186	186	12	111		-	
459	Rentals: Other	-	-	-	-		-	
464	Insurance	16,000	16,647	11,617	-		12,410	6.83%
470	Utilities	240	489	-	247			
482	Repairs & Maintenance	727	1,752	4,537	1,539		6,038	33.08%
495	Taxes	-	-	-	-			
496	Educational Travel & Expenses	550	5,505	8,502	570		10,600	24.68%
499	Miscellaneous	-	-	100	-		100	0.00%
***Subtotal* - Services & Charges**		19,176	33,157	51,317	3,308		68,567	33.61%
***Subtotal* - Operating Budget**		83,345	141,406	169,550	66,188		190,800	12.53%
510	Administrative Costs	12,835	21,765	26,111	10,100		27,201	4.17%
511	Divisional Indirect	-	-	-	-		-	
531	Transfers	-	-	-	-		-	
900	Contingency	-	-	-	-		-	
***Subtotal* - Indirect**		12,835	21,765	26,111	10,100		27,201	4.17%
620/40	Capital Outlay	-	-	10,000	46,782			
TOTAL Program Budget		96,180	163,171	205,661	123,070		218,001	6.00%

5 Narrative Report

5.1 General Mosquito Issues

1999 was an interesting year for the district. It was another fairly wet year so mosquitoes flourished. The contract with Multnomah County Health District – Vector Control for mosquito surveillance was continued. *Aedes sticticus* and *Aedes vexans* were the most commonly found mosquitoes in our areas. These species present quite a nuisance due to their aggressive biting habits. *Culex* and *Anopheles* mosquitoes were produced in lower numbers throughout the summer, but are noteworthy because they are able to spread diseases.

5.2 Complaints

A lower number of complaints were received this year; however, the level of concern voiced in those complaints was high. Ridgefield and Washougal zipcodes were again high in percentage of complaints, representing 40% of the calls (see pages 5-6). Mosquitoes breeding on U.S. Fish and Wildlife refuges, where access and treatment have been limited, heavily impacted both areas. Meetings are scheduled to address issues with refuge personnel to seek authorization for proper treatment.

An email address (mosquito@swwhd.wa.gov) has been made available to the public to allow greater access for information and service requests.

5.3 Education

Additional time and resources were dedicated to increasing public and policy-maker knowledge about mosquito control and the operations of the District. Staff continues to work with Vancouver Cable TV to develop additional educational resources. Clark County Mosquito Control District Board members attended the annual Northwest Mosquito and Vector Control Association Conference and committed to additional resources for educational and informational materials. Visits were made to the Ridgefield and Washougal city council meetings to apprise them of mosquito issues in those cities.

5.4 Retention Ponds

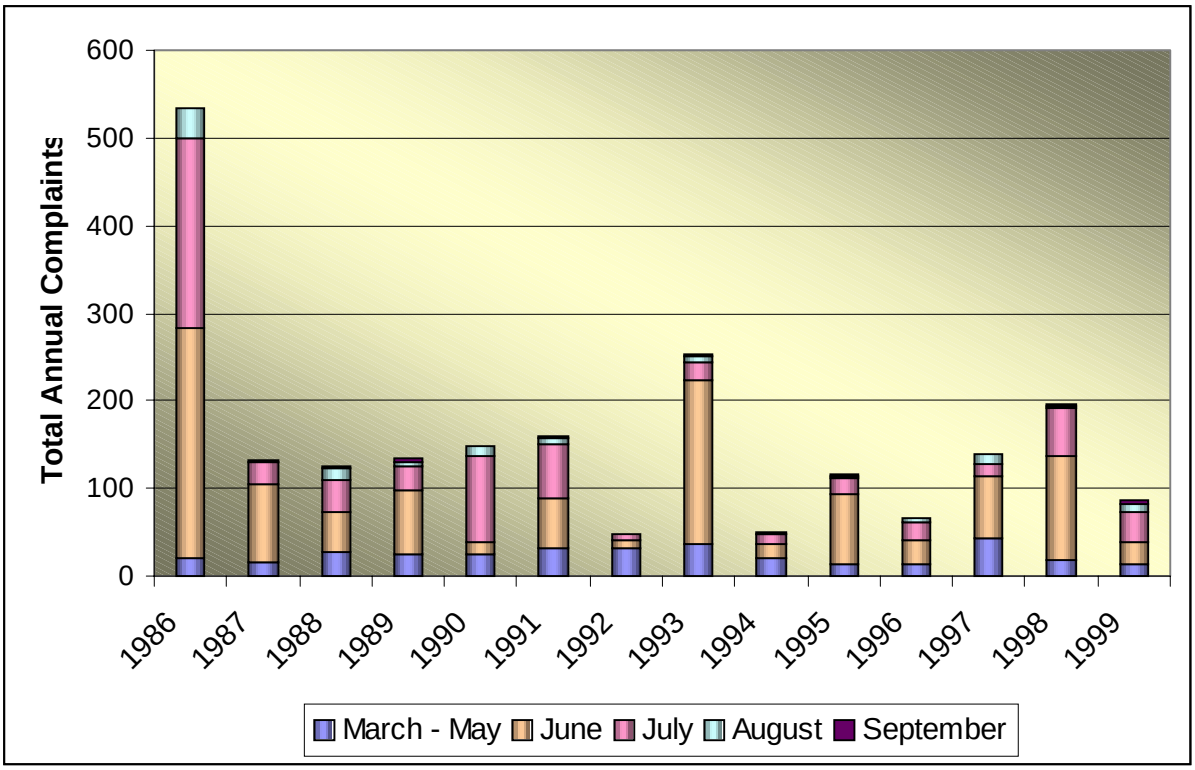
In 1999, City / County Agencies, City Planning, and Southwest Washington Health District coordinated efforts to locate and document retention ponds. Agencies approving the placement of ponds have begun informing the District of new development and thus allow the District to assess mosquito impacts.

5.5 Future Project

District staff met with representatives of counties along the Columbia River to develop an area-wide aerial treatment program. Working together would allow more efficient and affordable application of mosquito control technology.

6 Mosquito Citizen Complaints

	March - May	June	July	August	September	Annual Totals
1986	20	263	217	34	0	534
1987	16	88	26	2	0	132
1988	27	46	36	14	2	125
1989	25	74	26	6	4	135
1990	26	13	99	10	0	148
1991	32	58	61	7	2	160
1992	31	11	6	1	0	49
1993	37	187	20	8	1	253
1994	21	15	11	3	0	50
1995	14	80	17	4	2	117
1996	14	27	21	4	1	67
1997	43	72	12	12	1	140
1998	18	120	53	3	2	196
1999	13	26	33	11	3	86
Monthly Totals	337	1080	638	119	18	**2192 To Date**
Monthly Average	*24*	*77*	*46*	*9*	*1*	*157*



7 1999 Complaint Statistics

City	Number of Complaints	Percent
Battle Ground	3	3%
Brush Prairie	1	1%
Camas	14	16%
La Center	1	1%
Ridgefield	21	24%
Vancouver	46	53%
Washougal	0	0%
Woodland	0	0%
Unknown	0	0%
Total	**86**	**100%**

Zip Code	Number of Complaints	Percent
98604	3	3%
98606	1	1%
98607	14	16%
98629	1	1%
98642	21	24%
98660	1	1%
98661	2	2%
98662	3	3%
98664	1	1%
98665	8	9%
98668	1	1%
98683	3	3%
98684	2	2%
98685	20	23%
98686	3	3%
Unknown	2	2%
Totals	**86**	**100%**

8 Control Agents

8.1 History

Historically, toxic chemicals such as DDT were used to control mosquito populations throughout the United States. DDT was developed in 1873, but it wasn't until 1939 that the effectiveness of DDT as an insecticide was discovered. The use of DDT increased enormously on a worldwide basis after World War II, primarily because of its effectiveness against the mosquito that spreads malaria and lice that carry typhus. The World Health Organization estimates that during the period of its use, approximately 25 million lives were saved. DDT seemed to be the ideal insecticide as it was cheap and of relatively low toxicity to mammals. However, problems related to extensive use of DDT began to appear in the 1940's. Many species of insects developed resistance to DDT and DDT was also discovered to have a high toxicity toward fish. Due to short residual time and having such large areas to treat, malathion is no longer used by the District. [1]

The mosquito control programs then began to use Malathion, a low toxicity chemical with a 3-day residual. Due to short residual time and having such large areas to treat, Malathion is no longer used.

8.2 Clark County Today

Altosid

Altosid is a long-term, cost-effective, and environmentally responsible larvacide that prevents mosquito larvae from becoming breeding, biting adults. **Altosid** contains an insect growth regulator that interferes with normal mosquito development. It will not upset the food chain or impact fish and other non-target species. [2]

Bti *(Bacillus thuringiensis var. israeliensis)*

The Mosquito District is now using **Bti,** an approved strain of bacteria affecting only mosquito and black fly larvae thus sparing other insects. It is a biological control method and only effective in the early stages of mosquito larvae development, so timing is critical. **Bti** is considered harmless to non-target fauna, humans, and the environment. It is the only control agent used on wildlife reservations.

Goldenbear Oil *(GBO) (GB-1111)*

Goldenbear Oil is a special thin oil used to control mosquito larvae. It is sprayed onto the water surface when mosquito larvae are found. The oil spreads rapidly over the water surface, forming a thin monomolecular surface film. The larvae are then unable to break the water surface with their breathing tube, thus suffocating the larvae. **Goldenbear Oil** is effective for all stages of mosquito larvae. A few days after **Goldenbear Oil** is applied, the film will have dissipated from the water by evaporation. **Goldenbear Oil** does not have a long-lasting control period and must be reapplied as needed. It is not used in water containing fish.

Scourge (Resmethrin)

Scourge is used to control the adult mosquito population. It is sprayed early in the morning when the mosquito is actively seeking a blood meal. The active ingredient in **Scourge** breaks down in less than four hours in sunlight. [3]

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[1] www.chem.ox.ac.uk/mom/ddt/ddt.html
[2] www.altosid.com
[3] www.ultranet.com/~ncmcp/scourge.htm

1999 Clark County Control Agent Usage Statistics

Area	**Altosid** *(lbs)*	**BTI** *(lbs)*	**Scourge** *(oz)*	**GBO** *(gal)*	**Acres Treated**	**Mosquitoes Eliminated**
Vancouver	18	145	0	.3	37	223,000,000
Camas	0	140	690	3.3	128	296,000,000
Battle Ground	0	0	0	.5	4	8,000
La Center	0	5	0	8	20	19,000,000
Ridgefield	44	364	516	3	357	626,000,000
Washougal	90	176	0	43	78	1,000,000,000
North County	0	70	0	3	15	88,000,000
Totals	**134**	**900 lbs**	**1206 oz**	**61 gal**	**639 acres**	**2,252,008,000**

9 General Information

9.1 Mosquito Control In and Around the Home [4]

Mosquito control is both a public and private responsibility. The District policy is to control large populations of moquitoes, but it is impossible to eliminate mosquitoes entirely. Therefore, individuals and families will find it necessary at times to use their own control methods. The following suggestions are made to help you with this.

Several repellants that can be applied to the skin are effective against mosquitoes. These agents do not kill mosquitoes, but make them avoid biting people. Persons working or playing in mosquito-infested areas should use repellants containing ingredients such as diethyl phthalate, diethyl carbamate, diethyl toluamide (DEET), and ethyl hexanediol. Check the label for these active ingredients. Repellants are formulated and sold as aerosols, creams, solids (sticks), and liquids. Use caution if applying them to small children. Follow instructions on the label.

Oil of citronella is another type of mosquito repellant for space repelling. Oil of citronella is the active ingredient in many of the candles, torches, or coils, which may be burned to produce a smoke, which repels mosquitoes. These products should be used outdoors only, and under windless conditions. Their effectiveness is somewhat less than repellants applied to the body or clothing. Follow instructions on the label.

Space sprays may be used to kill mosquitoes present at the time of treatment. The major advantage of space treatment is immediate knockdown, quick application, and relatively small amounts of materials required for treatment. Space sprays are most effective *indoors*. Outdoors, the insecticide particles disperse rapidly and may not kill many mosquitoes. The major disadvantage of space spraying is that it will not manage insects for long periods of time. Follow instructions on the label.

Mosquitoes can be killed *inside* the house by using **household aerosol space spray** containing *synergized pyrethrum* or *synthetic pyrethroids* (allethrin, resmethrin, etc.). Only insecticides labeled for flying insect management should be sprayed into the air. Best results are obtained if doors and windows are kept closed during spraying and for 5-10 minutes after spraying. Follow directions on the label.

Homeowners may use **hand-held foggers** or **fogging attachments** on tractors or lawn mowers for temporary relief from flying mosquitoes. *Pyrethrins* or *5% malathion* can be fogged outdoors. Follow instructions on fogging attachments for application procedure.

You can cover windows and doors with screens if they are going to be left open during the mosquito season.

[4] www.mosquito.org

9.2 Premise Control [5]

The most effective way to control mosquitoes is to find and eliminate their breeding sites. Eliminating large breeding areas such as swamps, or sluggishly moving streams or ditches may require community-wide effort. Homeowners can take the following steps to prevent mosquito breeding on their own property:

1. Destroy or dispose of tin cans, old tires, buckets, plastic sheeting or other containers that collect and hold water. Do not allow water to accumulate at the base of flowerpots or in pet dishes for more than 2 days.

2. Clean debris from rain gutters and remove any standing water under or around structures, or on flat roofs. Check around faucets and air conditioner units; repair leaks or puddles that remain for several days.

3. Change water in birdbaths and wading pools at least once a week.

4. Fill or drain puddles, ditches, and swampy areas and either remove, drain, or fill tree holes and stumps with mortar.

5. Eliminate seepage from cisterns, cesspools, and septic tanks.

6. Eliminate standing water around animal watering troughs.

7. Irrigate lawns and gardens carefully to prevent water from standing for several days.

8. Livestock water troughs are a big contributor in the rural areas and need to be checked regularly. To prevent problems draining the trough or treating with Bti is recommended.

[5] www.mosquito.org

9.3 The Ten Most Frequently Asked Questions About Mosquitoes [6] [7]

1. How many species of mosquitoes are in the world?
   About 2,700

2. How much blood does a female mosquito drink per serving?
   About 5-millionths of a quart (for an Aedes aegypti).

3. What is the average number of mosquito bites a person receives before taking action (going indoors or putting on a personal repellant)? *3*

4. How do mosquitoes find new hosts?
   By sight (they observe movement); by detecting infrared radiation emitted by warm bodies; and by chemical signals (mosquitoes are attracted to carbon dioxide and lactic acid, among other chemicals).

5. How fast can a mosquito fly?
   An estimated 1 to 1.5 miles per hour.

6. A female mosquito passes contractible diseases, such as malaria, yellow fever, dengue fever, and encephalitis to her eggs. Once a mosquito ingests infected blood, she will contract the disease within 10 days.

7. How far away can a mosquito smell you, or a cow, or another host?
   20-35 yards.

8. What color clothing should be worn in mosquito-infested areas? *Light colors should be worn because mosquitoes are attracted to dark colors.*

9. What is the most effective protection against biting insects?
   The most effective treatment is a repellent containing DEET.

10. How well do bug zappers work?
    Forget about bug zappers! Scientific studies show that bug zappers actually attract more mosquitoes into your backyard. In fact, many beneficial insects are killed. Bug zappers may provide some psychological relief and gratification, but they'll also run up your electric bill without controlling your mosquito problem.

[6] whyfiles.news.wisc.edu/016skeeter/skeeter_facts.html
[7] www.mosquitoes.com

10 Mosquito Information and Reporting Complaints

Would you like to find out more about mosquitoes? Check out the following websites.

10.1 Web Sites

www.nwmvca.org Northwest Mosquito & Vector Control Association

www.mosquitoes.com

www.mosquito.org

www.whyfiles.news.wisc.edu/016skeeter/skeeter_facts.html

10.2 Reporting Mosquito Complaints

When reporting a mosquito complaint it is very important to give complete information. This allows for timely response by the Clark County Mosquito Control crew. Please have the following information when reporting a complaint:

1. Your name
2. Your mailing address
3. Contact telephone with best times to call
4. Fax number, if available
5. Email address, if available
6. Location of the problem
7. Description of the problem

Once our office has received your complaint, material will be sent to your home for your review. You will also be asked to draw a map locating the problem site and return it to our office.

10.3 How To Contact Us

1. Mosquito Complaint Hot-Line (March 1-October 1) (360) 397-8430

2. Southwest Washington Health District -Environmental Health (360) 397-8428

3. Fax (Attn: Mosquito Control) (360) 397-8084

4. Email: mosquito@swwhd.wa.gov