2017 Annual Report
Town of Johnstown
Mosquito Control Program

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Town of Johnstown
Mosquito Management Operations

Annual Report For 2017

Table of Contents

Program Objectives

Vector Disease Control International, LLC (VDCI) completed its 14th year of cost-effective Integrated Mosquito Management (IMM) for The Town of Johnstown in 2017. The primary objective of Johnstown's IMM Program is to monitor and reduce mosquito populations through the use of specific, environmentally sound, control techniques in order to protect its residents from the threat of mosquito-borne diseases. VDCI prioritizes the detection and elimination of larval mosquitoes in aquatic habitats, in conjunction with the monitoring of adult mosquito populations through routine surveillance, in order to assess West Nile virus vector species abundance in the area.

Open communication is maintained by VDCI between the HOA Residents, Property Management Companies, the Weld and Larimer County Departments of Health & Environment and surrounding municipalities to ensure that the highest level of mosquito control and epizootic response is achieved. This diligent and cooperative communication is important to the Town of Johnstown mosquito management program and provides significant benefit to public health throughout the entire area.

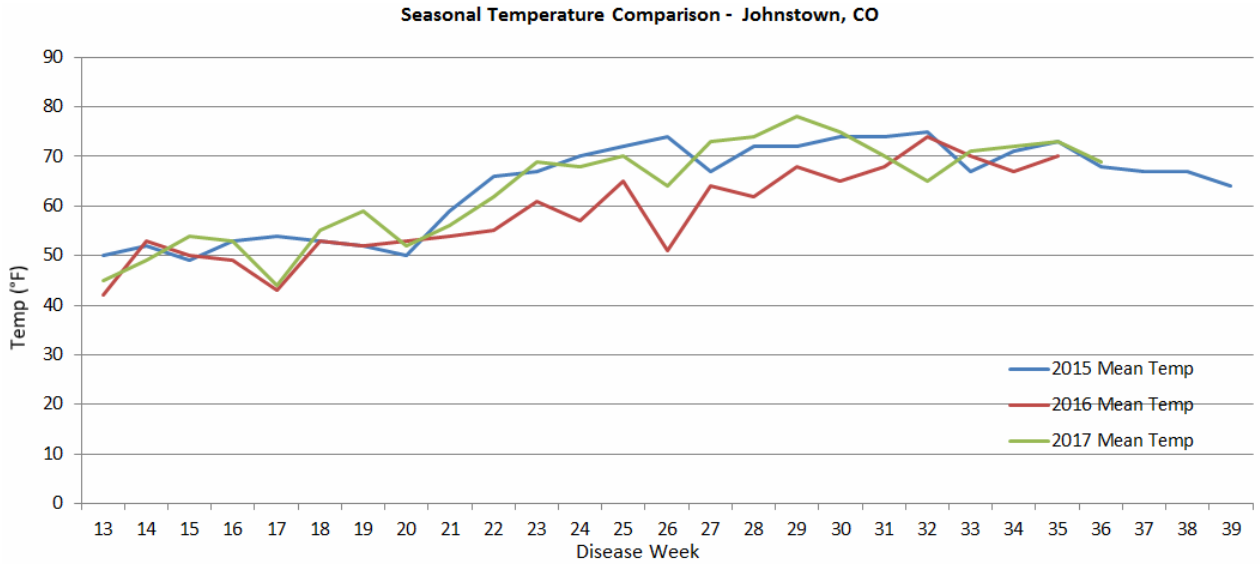
VDCI's Commitment

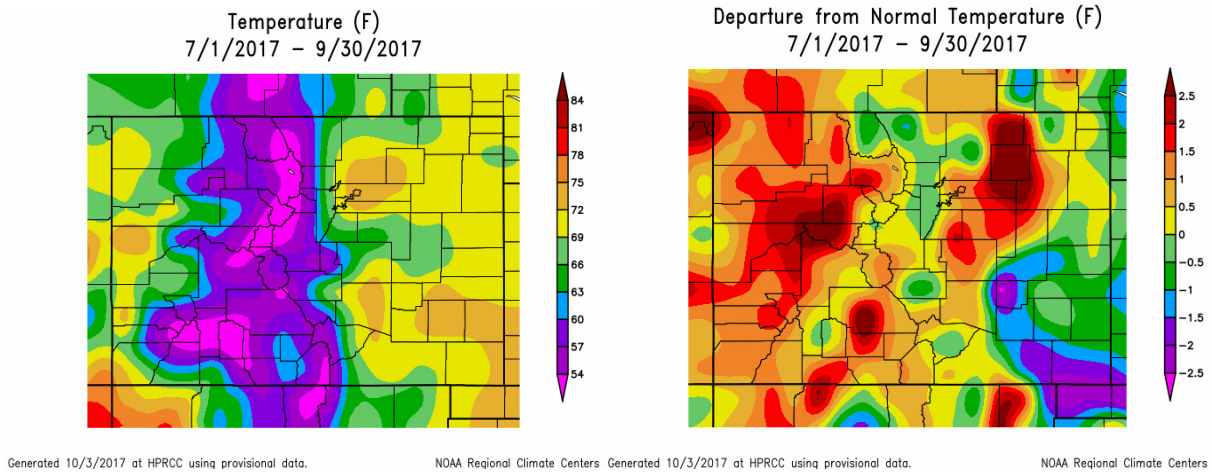
Vector Disease Control International is a company built on the foundations of public health, ethics, professionalism, and technical expertise. VDCI is committed to providing our customers with scientifically based, environmentally sensitive and technologically advanced Integrated Mosquito Management (IMM) programs of the highest quality. All of our employees are committed to excellence in vector control and public health and strive to improve the quality of human life in communities through public education and the control of mosquitoes and the diseases they can transmit. VDCI currently has programs across the state of Colorado, providing services for towns, cities, counties, homeowners associations, and encephalitis surveillance monitoring programs for county health departments.

Vector Disease Control International, as the contractor for The Town of Johnstown, will continue to use proven scientific Integrated Mosquito Management techniques to survey and control local mosquito populations using biorational larval controls and limited low-toxicity insecticide applications. All of the methods and materials used have been reviewed and registered by the US Environmental Protection Agency, the Centers for Disease Control, the Colorado Department of Agriculture and the American Mosquito Control Association.

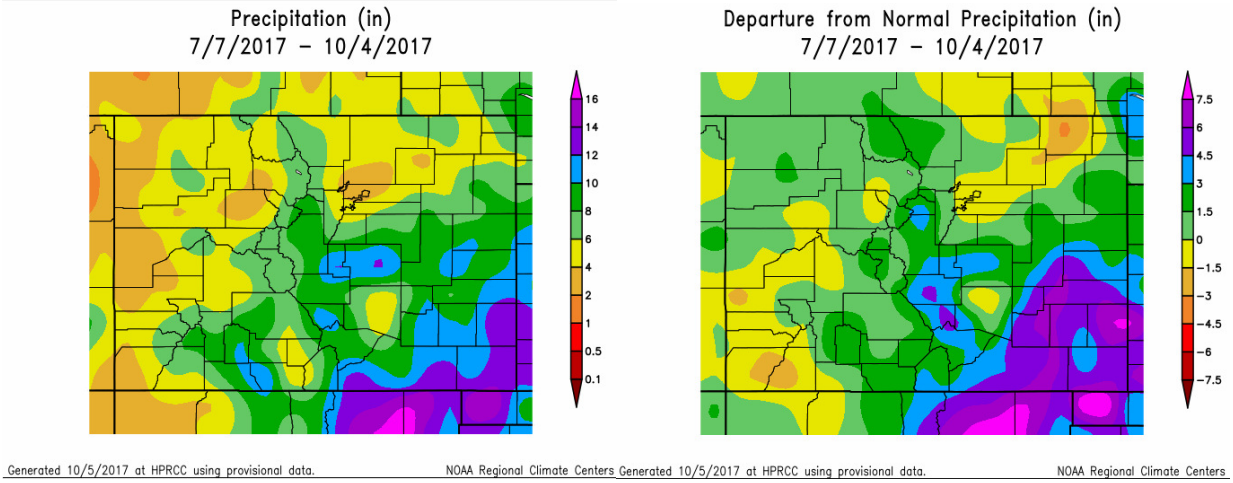
2017 Season Perspective

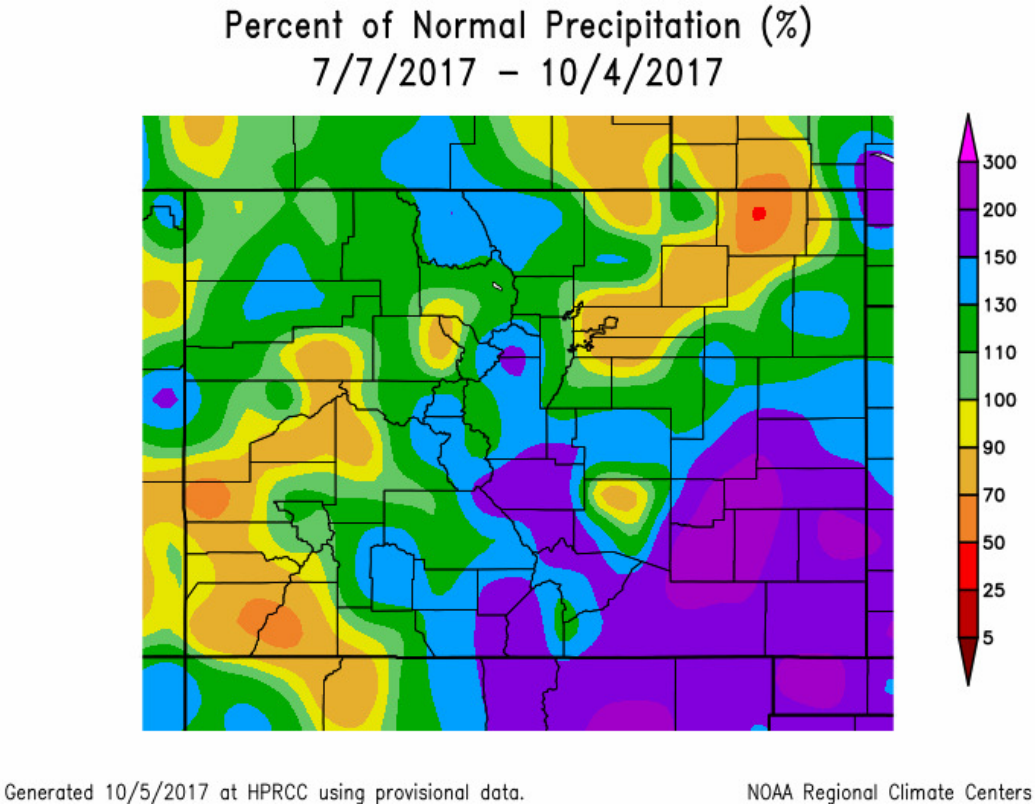
At VDCI we have come to expect each Colorado summer to present a unique set of temperature, precipitation, irrigation, and human interactions that combine to create new and different challenges in both mosquito control and mosquito-borne disease proliferation. The late-spring and early summer of 2017 started off with a higher than average amount of snowpack, with the South Platte River Basin measuring approximately 209% above normal snowpack. Combined with above average precipitation in May, mosquito abundance remained above historical averages for most of the season. However, West Nile virus activity in both mosquito and human populations remained below average throughout the summer.





Both Larimer and Weld County experienced higher than average precipitation during the summer of 2017 with an uncharacteristic snow in early May and sporadic rainfall throughout the summer. As is typical in Northern Colorado there were weeks with no measurable rainfall followed by those with extremely high moisture and temporary flooding.





West Nile Virus Activity

Since the introduction of West Nile virus to the United States in 1999, the virus has made a complete westward expansion to the West Coast. Starting in the Northeastern parts of the United States, the virus steadily spread through the South, the Midwest, the Rocky Mountain region and to the Western States. This extensive distribution is due to the ability of WNv to establish and persist in the wide variety of ecosystems present across the country. WNv has been detected in 65 different mosquito species in the U.S., though it appears that only a few *Culex* species drive epizootic and epidemic transmission (WNv Guidelines CDC 2013). Although West Nile virus has been endemic to the United States since 1999, researchers continue to seek an understanding for some of the factors which contribute to region specific spikes in vector abundance and human risk. We still do not understand why some humans develop West Nile fever while other infections develop into more serious West Nile encephalitis or West Nile meningitis cases. Additionally, physicians and researchers continue to seek answers to the variable recovery times and occurrence of deaths that result with some infections. WNV has expanded to the point that it can now be found in all 48 contiguous states and has produced two additional, large nationwide epidemics in 2003 and 2012 (WNv Guidelines CDC 2013).

As of October 3, 2017, a total of 47 states and the District of Columbia have reported West Nile virus infections in people, birds, or mosquitoes in 2017. Overall, 1,175 cases of West Nile virus disease in people have been reported to CDC. Of these, 741 (63%) were classified as neuroinvasive disease (such as meningitis or encephalitis) and 434 (37%) were classified as non-neuroinvasive disease.

West Nile Virus Activity by State – United States, 2017 (as of October 3, 2017)

Colorado 2017

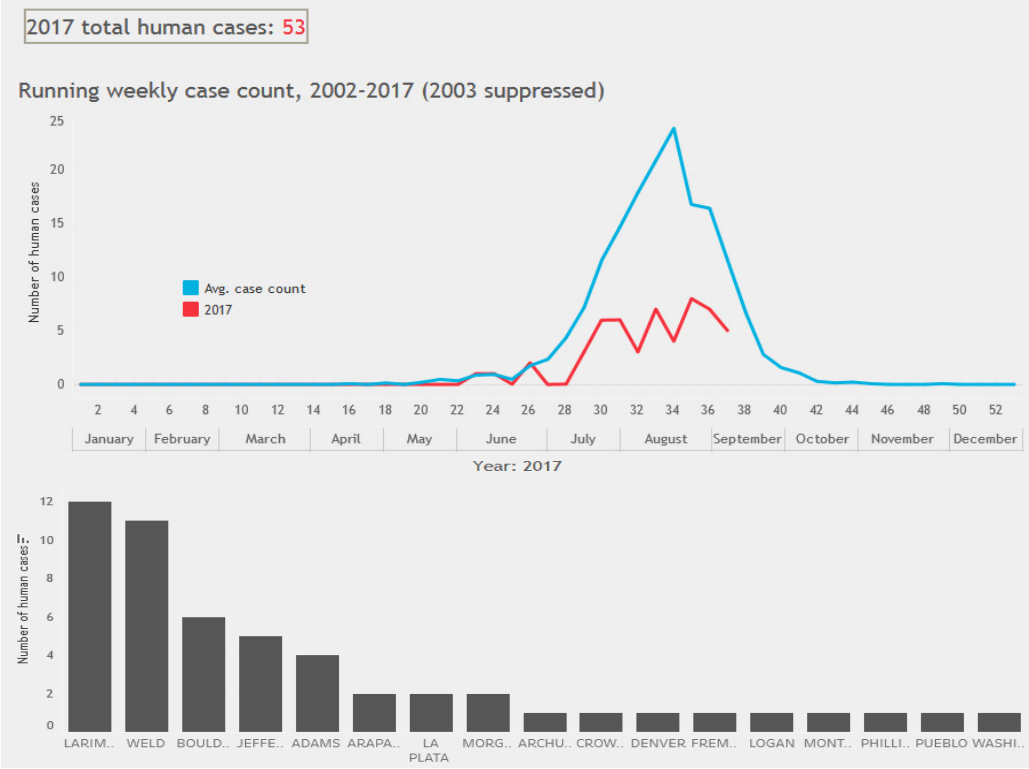
As of October 3rd the Centers for Disease Control has reported 43 cases of human West Nile virus (WNv) infections in the state of Colorado. Seventeen of these cases were neuroinvasive including symptoms of meningitis or encephalitis (including meningoencephalitis), and 26 are non-neuroinvasive which includes cases where individuals are non-symptomatic or present with fever and other minor symptoms. There have been two deaths associated with West Nile virus infections from Colorado in 2017.

West Nile Virus Disease Cases* and Presumptive Viremic Blood Donors
2017 (as of October 3, 2017)

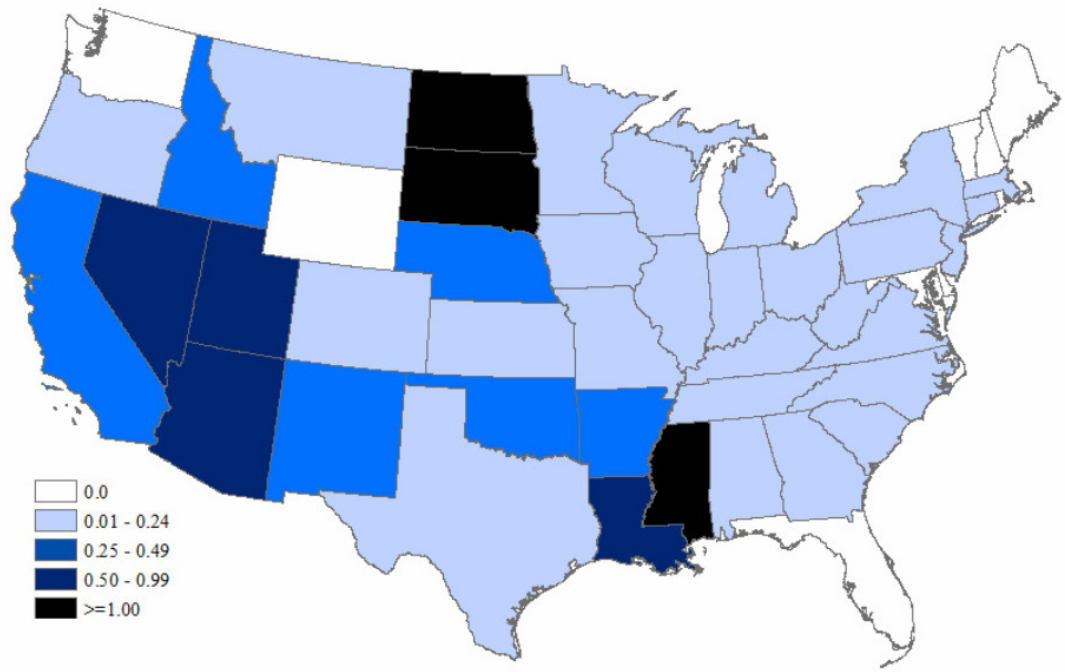
State	Neuroinvasive Disease Cases*	Non-neuroinvasive Disease Cases	Total cases	Deaths	Presumptive viremic blood donors‡
Colorado	17	26	43	2	3

(https://www.cdc.gov/westnile/statsmaps/preliminarymapsdata2017/disease-cases-state.html)

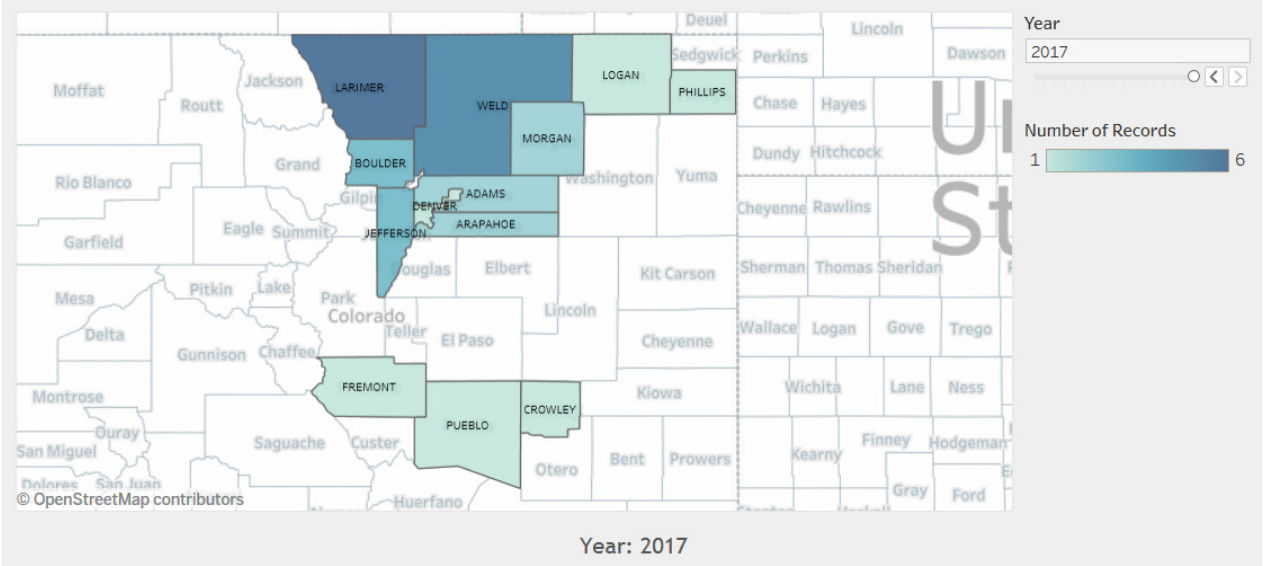
To date the Colorado Department of Health and Environment reports a total of 53 human cases of West Nile virus infection from the state of Colorado. Many of these human cases are concentrated in Northern Colorado with 12 human cases reported from Larimer County, 11 from Weld County and 6 from Boulder County.



West Nile Virus Neuroinvasive Disease Incidence by State – United States, 2017 (as of September 19, 2017)



This map shows the incidence of human West Nile virus neuroinvasive disease (e.g., meningitis, encephalitis, or acute flaccid paralysis) by state for 2017 with shading ranging from 0.01–0.24, 0.25–0.49, 0.50–0.99, and greater than 1.00 per 100,000 population.



Source: https://www.colorado.gov/pacific/cdphe/west-nile-virus-data

Larval Mosquito Control

Larval mosquito control is the foundation of the Town of Johnstown's Mosquito Control program and can be an extremely effective way to manage mosquitoes, thereby reducing the number of potential disease vectors and annoyances associated with biting adults. Years of research and practical experience have shown that the most effective way to control mosquito populations is through an aggressive Integrated Mosquito Management (IMM) approach. This approach aims at using a variety of concepts, tools, and products to reduce a pest population to a tolerable level.

Pre-season larval control work involved ground truthing GIS maps and remapping areas where new development or flooding had altered the landscape. VDCI began larval site inspections in many areas mid-April. Hiring of seasonal field technicians began in March and continued into May. VDCI's Annual Field Technician Classroom Training Day took place on May 22nd with over 50 new and returning field technicians in attendance. Field training by VDCI management and veteran employees lasted through May and full time field activities were in force by mid-May.

In 2017 Vector Disease Control International performed 397 larval site inspections, of which 363 sites (91.4%) were wet upon inspection and 202 (55.4%) were producing mosquito larvae in the Town of Johnstown. VDCI applied 1,191.8 lbs. of VectoBac (Bti), and 4.8 gallons of BVA mineral oil to 130.1 acres of lands in the Town of Johnstown.

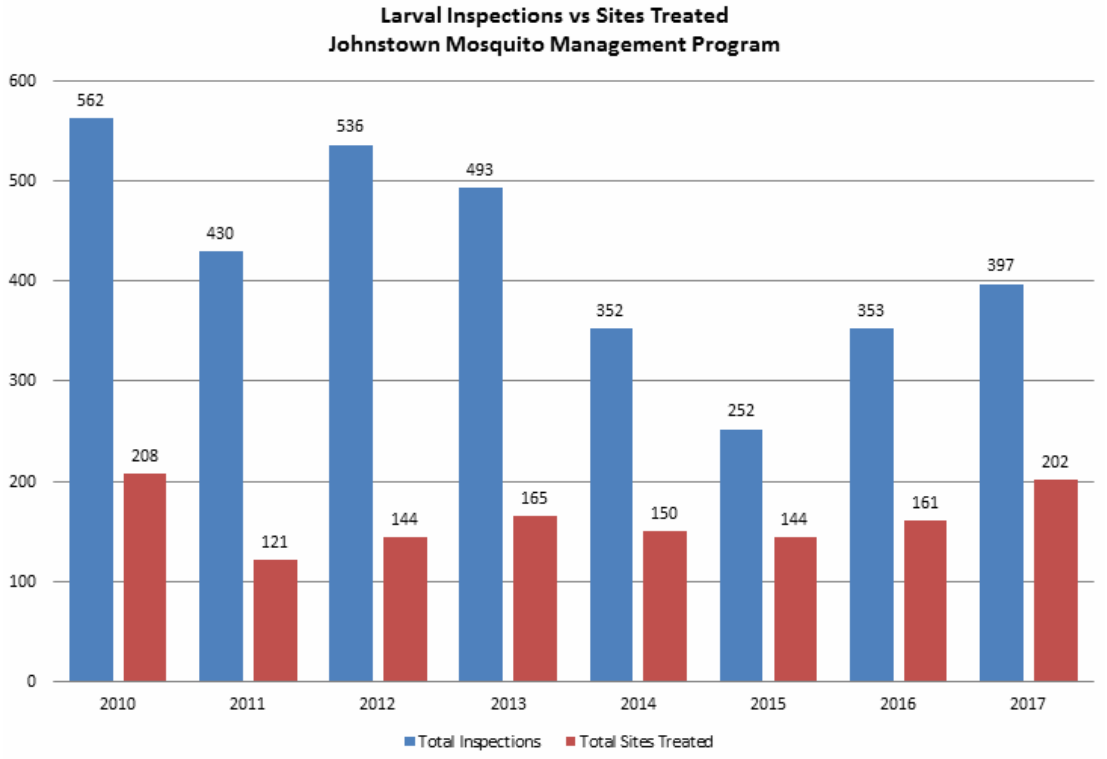
In 2016 Vector Disease Control International performed 353 larval site inspections, of which 285 sites (80.7%) were wet upon inspection and 161 (56.5%) were producing mosquito larvae in the Town of Johnstown. VDCI applied 945 lbs. of VectoBac (Bti), and 2.8 gallons of BVA mineral oil to 152.3 acres of lands in the Town of Johnstown.

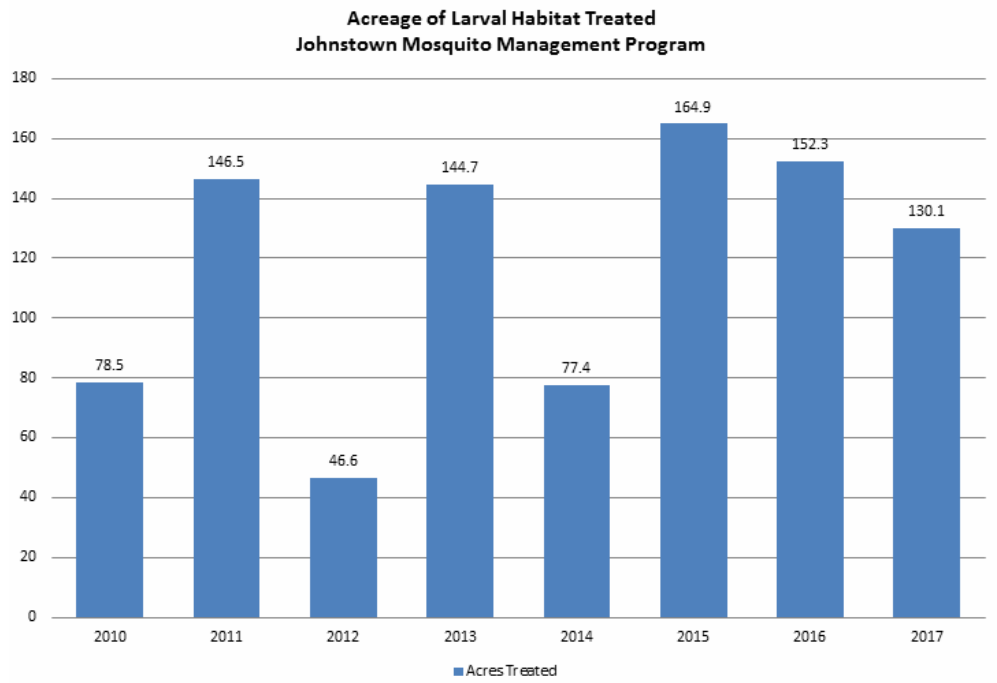
In 2015 Vector Disease Control International performed 252 larval site inspections, of which 218 sites (86.5%) were wet upon inspection and 144 (65.6%) were producing mosquito larvae in the Town of Johnstown. VDCI applied 1,187.9 lbs. of VectoBac (Bti), 154.5 lbs. of Vectolex (Bs) and 16.4 gallons of BVA mineral oil to 164.9 acres of lands in the Town of Johnstown.

Larval mosquito control can be achieved in several ways including biological, biochemical, chemical, and mechanical means. No single larvicide product will work effectively in every habitat where mosquito larvae are found, so a variety of products and methods should be employed. Additionally, although there are a variety of methods for reducing larval populations, some may have negative consequences that outweigh their benefits. Mechanical or physical habitat modification is a technique which VDCI uses on relatively small scale projects, as the area to be modified must be carefully reviewed.

VDCI's favored method of larval mosquito control is through the use of bacterial bio-rational products. The main product used by VDCI is a variety of bacteria (*Bacillus thuringiensis var. israeliensis*). *Bti*, as it is known, has become the cornerstone of mosquito control programs throughout the world. The benefits include its efficacy and lack of environmental impacts. When used in accordance with its label, successful control of mosquito larvae can be achieved without impact to non-target species such as other aquatic invertebrates, birds, mammals, fish, amphibians, reptiles, or humans. A broad label allows for the use of the product in the majority of the habitats throughout the service area. Another bacterial product closely related to *Bti* is *Bacillus sphaericus (Bs)*. *BS* provides similar benefits to *Bti* while also providing residual control of certain species of mosquitoes. It is used specifically in difficult to treat areas where *Culex* are the predominant species due to its limitations and high cost.

Other larval control products include the insect growth regulator methoprene (Altosid), and light mineral oils (BVA 2 larvicide oil). Methoprene is a synthetic version of a juvenile growth hormone in larval mosquitoes. The hormone prevents the normal development of larval mosquitoes into pupae and adults, eventually causing death. VDCI limits the use of chemical larvicides to areas with little biodiversity, such as road side ditches, or areas that chronically produce high mosquito populations. They are only used after a thorough assessment has been made of any habitat where their use is being considered. Mineral oil is the only product effective in controlling mosquito pupae and therefore is an essential tool when pupae are present.





VDCI Surveillance Laboratory

Information about mosquito abundance and species diversity is essential to integrated program. Vector Disease Control International employs two kinds of traps to monitor mosquito populations. The most commonly used is the CDC light trap which uses carbon-dioxide from dry ice as bait to attract female mosquitoes seeking a blood meal from a breathing animal. Once attracted by the CO_2, the mosquitoes are lured by a small light to a fan that pulls them into a net for collection. The second type of trap VDCI uses is called a gravid trap. Gravid traps use a tub of highly-organic water as bait to attract female mosquitoes that are looking for a place to lay their eggs. A fan placed close to the water surface forces mosquitoes that come to the water into a collection net. Once back in the laboratory, the contents of the trap nets are counted and speciated by trained technicians.

In 2017, Vector Disease Control International monitored a statewide network of hundreds of weekly trap sites, collecting 759,180 adult mosquitoes that were counted and identified to species by the VDCI Surveillance Laboratories. While individual traps provide only limited information, trap data is interpreted in the context of historical records for the same trap site, going back in time more than a decade. Individual traps are also compared to other traps from around the region that were set on the same night and therefore exposed to similar weather conditions. Technicians working in the Surveillance Laboratories at Vector Disease Control International are trained to provide accurate species-level identification of both larval and adult mosquitoes.

Additionally, the VDCI Surveillance Laboratory conducts an intensive larval identification program with larval mosquito samples collected by I&L technicians prior to larviciding being identified to species. This information is now invaluable in targeting mosquito control efforts as we gain a greater understanding of the habitat types preferred by Colorado mosquito species and the seasonality of these habitats as sites for mosquito development.

Specimens and data collected from these traps and larval identification are used in:

- Determining the effect of larval control efforts. Each mosquito species prefers specific kinds of habitats for larval development. If a trap includes large numbers, it could indicate the presence of an unknown larval habitat and, based on the species identification and known habitat preference for that species, direct field technicians as to possible sources of the mosquitoes collected.

- Determining larval and adult mosquito species. This helps to illustrate the threat of mosquito-borne disease amplification and transmission because different mosquito species can vector different diseases to people and animals.

- Determining where adult control efforts were necessary. While mosquito eradication is impossible, significant population reduction is achievable. In places where larval control is insufficient, such as neighborhoods where adult mosquitoes have migrated in from outside of the control area, it may be necessary to use adulticide methods, such as ULV truck fogging or barrier sprays of harborage areas. Trap counts that exceed an acceptable threshold for an area may trigger adult control measures.

- Surveillance for Mosquito-borne Disease. Historically, VDCI efforts were targeted primarily at controlling mosquito nuisance problems with limited disease surveillance. However, since the arrival of the West Nile virus in Colorado in August of 2002, the paradigm has shifted toward disease prevention and control. Accurate species identification of the mosquitoes in the traps is important when monitoring species population trends. It also is necessary for evaluating whether a population spike represents an actual increase in disease transmission potential or only an increased nuisance level.

SURVEILLANCE LIGHT TRAP DATA

In 2017, an average of 5 surveillance light traps monitored adult mosquito populations within the Town of Johnstown on a weekly basis. Surveillance trapping began the week of June 1st and full scale trapping was concluded on August 31st. There were 65 CDC light surveillance traps set within the Town of Johnstown, which collected a total of 15,847 mosquitoes. This year there was an average of 244 mosquitoes caught per trap per night and an average 60 *Culex* mosquitoes per trap per night. The composition of mosquitoes collected was 24.6% (3,905) *Culex spp.*, 75.2% (11,922) *Aedes/Ochlerotatus spp.*, and less than 1% (16) *Culiseta spp.* Please refer to the Light Trap Genus Summary for a weekly breakdown of mosquitoes collected by trap location.

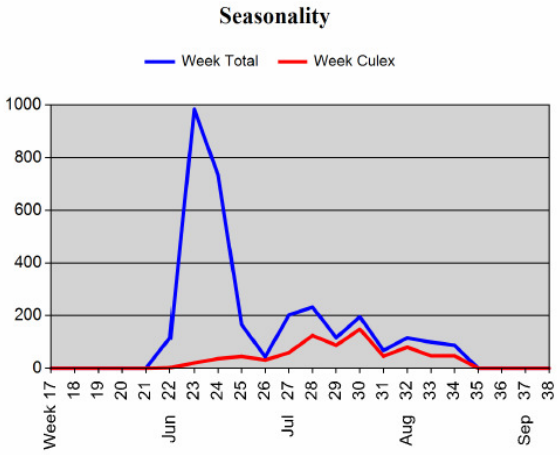
By comparison, in 2016, an average of 5 surveillance light traps monitored adult mosquito populations within the Town of Johnstown. Surveillance trapping began the week of June 1st and full scale trapping was concluded on August 28th. There were 59 CDC light surveillance traps set within the Town of Johnstown, which collected a total of 6,588 mosquitoes. There was an average of 112 mosquitoes caught per trap per night and an average 55 *Culex* mosquitoes per trap per night. The composition of mosquitoes collected was 49.7% (3,273) *Culex spp.*, 50.1% (3,298) *Aedes/Ochlerotatus spp.*, and less than 1% (16) *Culiseta spp.*

2017 Johnstown CDC Trap Composite Data

Total number of trap/nights set:	65
Total number of mosquitoes collected:	15,847
Average mosquitoes per trap/night:	244
Average Culex per trap/night:	60

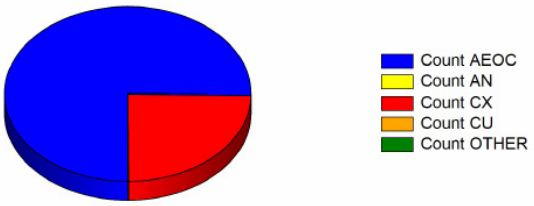
Species collected and abundance:

Aedes (Oc.) dorsalis	342	2.2 %
Aedes (Oc.) melanimon	59	0.4 %
Aedes (Oc.) trivittatus	19	0.1 %
Aedes vexans	11502	72.6 %
Coquillettidia perturbans	4	0.0 %
Culex pipiens	782	4.9 %
Culex salinarius	153	1.0 %
Culex tarsalis	2970	18.7 %
Culiseta inornata	16	0.1 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	11,922	75.2 %
Anopheles	0	0.0 %
Culex	3,905	24.6 %
Culiseta	16	0.1 %
Other	4	0.0 %



In 2017 Weld County traps collected a total of 171,150 mosquitoes. A total of 16 species were represented. The graphs show that the majority of mosquitoes in Weld County are floodwater species resulting from above average snowpack, precipitation, and floodwater irrigation throughout the season.

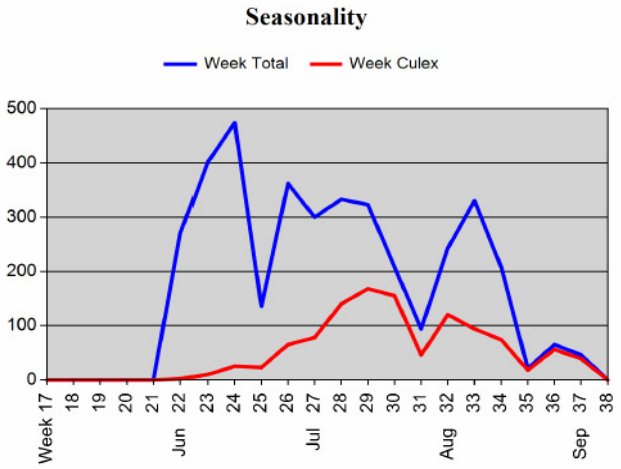
By comparison Weld County traps collected a total of 121,968 mosquitoes in 2016, 199,847 mosquitoes in 2015, and 167,722 mosquitoes in 2014.

2017 Weld CDC Trap Composite Data

Total number of trap/nights set:	593
Total number of mosquitoes collected:	171,150
Average mosquitoes per trap/night:	289
Average Culex per trap/night:	78

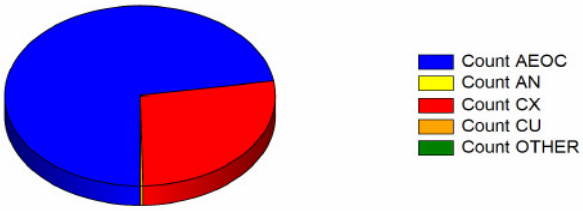
Species collected and abundance:

Aedes (Oc.) campestris	2	0.0 %
Aedes (Oc.) dorsalis	17818	10.4 %
Aedes (Oc.) fitchii	4	0.0 %
Aedes (Oc.) hendersoni	8	0.0 %
Aedes (Oc.) increpitus	505	0.3 %
Aedes (Oc.) melanimon	14480	8.5 %
Aedes (Oc.) nigromaculis	62	0.0 %
Aedes (Oc.) spencerii idahoensis	24	0.0 %
Aedes (Oc.) trivittatus	1633	1.0 %
Aedes cinereus	4	0.0 %
Aedes vexans	89447	52.3 %
Aedes/Ochlerotatus spp	11	0.0 %
Anopheles hermsi	7	0.0 %
Coquillettidia perturbans	13	0.0 %
Culex erythrothorax	21	0.0 %
Culex pipiens	8711	5.1 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	123,998	72.5 %
Anopheles	7	0.0 %
Culex	46,538	27.2 %
Culiseta	594	0.3 %
Other	13	0.0 %



WEST NILE VIRUS MOSQUITO SAMPLE TESTING RESULTS

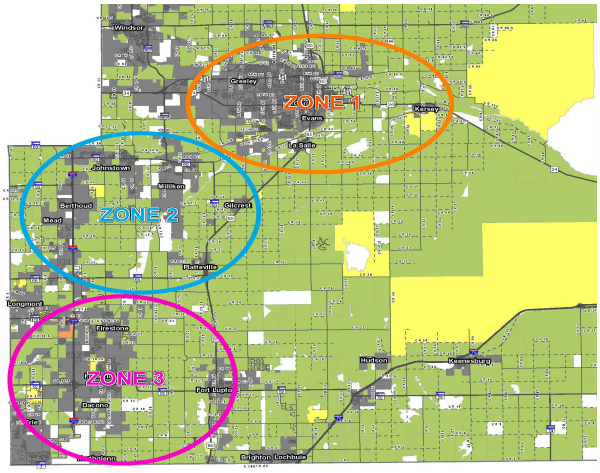
Many local health departments have moved towards mosquito-based surveillance indicators to assess the weekly risk of West Nile transmission and guide response decisions for adult mosquito control applications. The vector index and infection rate is derived by testing the mosquitoes VDCI collects for the presence of West Nile virus. This value is closely monitored by the CDPHE and local health departments to evaluate the risk posed by the vector mosquito population.

As defined in the CDC guidelines for West Nile virus surveillance, prevention and control, the vector index (VI) is an estimate of the number of West Nile virus infected mosquitoes in an area. This number can serve as a human health risk value. An operational value of 0.5, which was derived from the comparison of historical data for human infections, as well as relative abundance and infection in mosquitoes, serves as an indicator of high risk for West Nile virus transmission to humans in the corresponding area. As the value of the vector index increases there is a corresponding risk of human disease and this value can be used to offset epidemics.

Due to budget cutbacks associated with West Nile virus surveillance in recent years, the CDPHE does not have the ability to test mosquitoes from across the state but relies on a sentinel zone concept. As stated on the CDPHE website, the seasonal variation of West Nile virus risk can change throughout a summer and it is best to assume you have some risk for WNV if you have mosquitoes.

In 2017 there were a total of 333 mosquito pools samples submitted for West Nile virus testing from mosquitoes collected in Weld County. There were 41 confirmed positive samples reported from all three sentinel zone areas, of which, two were from mosquito samples collected from Johnstown . The first positive pool was collected on August 1st and the second on August 22nd. See Appendix 1 for positive pool locations for all of Weld County.

By comparison, in 2016, there were 62 confirmed mosquito pools infected with West Nile virus, out of 324 sample pools tested from sentinel locations in Weld County during 2016 (as reported by Weld County Health Department).



Vector Index Log 2017

CDC Week	Season Week	Zone 1	Zone 2	Zone 3
24	June 11-17	0.00	0.00	0.00
25	June 18-24	0.00	0.00	0.00
26	June 25 - July 1	0.00	0.00	0.00
27	July 2-8	0.00	0.20	0.00
28	July 9-15	0.00	0.00	0.00
29	July 16-22	0.20	0.00	0.19
30	July 23-29	0.18	0.40	0.00
31	July 30 - Aug 5	0.74	1.82	0.00
32*	Aug 6-12	0.00	0.17	0.65
33	Aug 13-19	0.40	0.68	0.20
34	Aug 20-26	0.65	1.07	0.44

* during week 32 there was an interruption in normal trap night due to abnormally wet and cold weather pattern

Adult Mosquito Control

The goal of Vector Disease Control International is to provide our customers with the best options for safe, effective, modern mosquito management. The primary emphasis of the Town of Johnstown's Mosquito Management Program is to control mosquitoes in the larval stage, using safe biological control products. When mosquito nuisance mosquitoes become too much or disease thresholds are reached VDCI will perform adult mosquito control application at the request of the Town of Johnstown. During the 2017 season a total of 228 miles of roads and access paths within Town of Johnstown were fogged using AquaKontrol 30-30.

VDCI uses state of the art technology, calibrated application timing, and least-toxic products to minimize non-target impacts. All adult mosquito control is accomplished using Ultra Low Volume (ULV) fogging equipment and performed after dusk when the majority of mosquito species are most active. This type of equipment produces droplets averaging 12 microns in diameter and allows for a minimal amount of product to be put into the environment. These treatments take place in the evening when mosquitoes are flying in greater numbers and non-target insect activity (for example, day-flying pollinators like bees) is greatly reduced. Using this application technique, the overall goal of minimal environmental impact and effective adult control is achieved in the targeted area.

Adulticide Data

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
Johnstown, Town of					
Backpack					
07/27/2017	PARISH PARK	Talstar	10:36:00	11:24:00	1.0
		Backpack		**Sum**	**1.0**
				Avg	**1.0**
				Min	**1.0**
				Max	**1.0**
Truck					
06/08/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	22:00:00	22:33:00	8.0
06/15/2017	Thompson River Ranch	Aqua Kontrol 30 30	20:49:00	21:25:00	6.0
06/22/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	12:15:00	12:43:00	7.0
06/29/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	23:35:00	12:04:00	7.0
07/13/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	01:15:00	01:55:00	7.0
07/13/2017	ROLLING HILLS RANCH	Aqua Kontrol 30 30	02:16:00	02:43:00	11.0
07/20/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	23:02:00	23:31:00	7.0
07/20/2017	ROLLING HILLS RANCH	Aqua Kontrol 30 30	22:17:00	22:43:00	5.0
07/20/2017	PIONEER RIDGE	Aqua Kontrol 30 30	21:00:00	21:21:00	5.0
07/20/2017	JOHNSTOWN CENTRAL	Aqua Kontrol 30 30	21:31:00	22:10:00	7.0
07/27/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	23:34:00	12:07:00	7.0
07/27/2017	ROLLING HILLS RANCH	Aqua Kontrol 30 30	12:30:00	12:58:00	5.0
07/27/2017	PIONEER RIDGE	Aqua Kontrol 30 30	22:47:00	23:11:00	5.0
07/27/2017	JOHNSTOWN CENTRAL	Aqua Kontrol 30 30	23:30:00	12:25:00	7.0
08/03/2017	Thompson River Ranch	Aqua Kontrol 30 30	23:47:00	00:14:00	7.0
08/03/2017	Pioneer Ridge	Aqua Kontrol 30 30	23:07:00	23:28:00	5.0
08/03/2017	Central	Aqua Kontrol 30 30	23:24:00	12:03:00	8.0
08/04/2017	Rolling Hills	Aqua Kontrol 30 30	00:07:00	00:29:00	4.0
08/10/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	22:30:00	23:05:00	7.0
08/10/2017	ROLLING HILLS RANCH	Aqua Kontrol 30 30	21:42:00	22:08:00	6.0
08/10/2017	CENTRAL	Aqua Kontrol 30 30	20:12:00	21:39:00	19.0
08/17/2017	CARLSON FARMS	Aqua Kontrol 30 30	22:05:00	22:42:00	10.0
08/17/2017	JOHNSTOWN CENTRAL	Aqua Kontrol 30 30	22:48:00	23:19:00	8.0
08/17/2017	PIONEER RIDGE	Aqua Kontrol 30 30	23:47:00	00:10:00	6.0
08/17/2017	ROLLING HILLS RANCH	Aqua Kontrol 30 30	23:22:00	23:37:00	5.0
08/17/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	23:24:00	23:59:00	7.0
08/24/2017	CENTRAL	Aqua Kontrol 30 30	21:34:00	22:13:00	9.0
08/24/2017	ROLLING HILLS RANCH	Aqua Kontrol 30 30	22:23:00	22:45:00	5.0
08/24/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	22:58:00	23:26:00	7.0
08/31/2017	THOMPSON RIVER RANCH	Aqua Kontrol 30 30	21:54:00	22:25:00	7.0
08/31/2017	ROLLING HILLS	Aqua Kontrol 30 30	21:15:00	21:37:00	6.0
08/31/2017	CENTRAL	Aqua Kontrol 30 30	20:36:00	21:12:00	8.0
		Truck		**Sum**	**228.0**
				Avg	**7.1**
				Min	**4.0**
				Max	**19.0**
				Grand Total	**229.0**

Public Relations and Education

VDCI is dedicated to providing strong Public Outreach and Education Programs to residents in all of our communities. Citizen complaints, inquiry, information and satisfaction surveys can aid in evaluating the effectiveness of a program. VDCI constantly looks for ways to better serve the communities we work with and encourages both the citizen and local media involvement in order to increase the effectiveness of our programs. We have clearly demonstrated that commitment and belief by proactively serving Town of Johnstown (and all of our contracted communities) with numerous innovative programs, activities and services.

Customer service is always a high priority for VDCI. We take pride in training each and every technician so that they have the knowledge to provide residents with the correct answers to their questions. Each field technician spends part of their day responding to resident concerns in their work area. This in-field customer service personalizes the mosquito control program, provides VDCI with local information on mosquito activity and presents a valuable opportunity to educate our residents about mosquito biology and control.

MosquitoLine™

VDCI maintains a toll-free telephone line: (877) 276-4306 and local lines at 970-962-2582 and 970-663-5697 (at no cost to the customer) to accept calls from the public concerning:

- Information about mosquito biology and source reduction of mosquito habitats
- information on program components, operations and monitoring
- Information on program components, operations, and monitoring
- Seasonal West Nile virus activity
- Personal protection options for mosquito annoyances and West Nile virus risk
- Reports about mosquitoes and possible larval mosquito habitats
- Requests to perform larvicide applications and/or opt-out of any adulticide spraying via a shut-off list
- Request notification when adulticide spraying is planned in their neighborhood
- Request health and safety information about mosquito control operations and pesticide products used

VDCI has provided Mosquito Hotlines to the residents in communities which we are contracted to also reduce workload by municipal personnel. This enables direct communication and response by mosquito control employees to resident's concerns about West Nile virus and larval site activity and treatment. VDCI maintains a log of calls received and will summarize call activity in monthly and annual reports.

In 2017 VDCI received 19 phone calls from residents of Johnstown. Thirteen calls were reports of mosquito annoyance. Six phone calls were requests for information regarding adulticide operations and call notification.

CALL NOTIFICATION & SHUTOFF SYSTEM

VDCI continues to maintain a comprehensive Call Notification & Shutoff database and will notify residents on the list when conducting ULV adulticide spray applications within the Town of Johnstown.

DAILY POSTING OF ULV SPRAY ZONES are maintained and updated online daily at http://www.vdci.net/colorado

Appendix 1: Weld County Positive Adult Sample Pool Test Results for West Nile Virus

Vector Disease Control International

Adult Sample Pool Data

Pool	Date	County	Trap Number	Quantity	Results	Species	Trap Type
S320261a	07/06/2017	Weld	PL-02	59	POSITIVE	Culex tarsalis	LIGHT
S320261a	07/06/2017	Weld	PL-04	5	POSITIVE	Culex tarsalis	LIGHT
S319883a	07/18/2017	Weld	DC-01	65	POSITIVE	Culex tarsalis	LIGHT
S320348a	07/18/2017	Weld	KR-02	55	POSITIVE	Culex tarsalis	LIGHT
S319928a	07/25/2017	Weld	GY-15	65	POSITIVE	Culex tarsalis	LIGHT
S319941a	07/25/2017	Weld	VV-01	65	POSITIVE	Culex tarsalis	LIGHT
S319991a	08/01/2017	Weld	GY-15	65	POSITIVE	Culex tarsalis	LIGHT
S319993a	08/01/2017	Weld	LS-01	65	POSITIVE	Culex tarsalis	LIGHT
S319995a	08/01/2017	Weld	KR-02	21	POSITIVE	Culex tarsalis	LIGHT
S319995a	08/01/2017	Weld	LS-01	30	POSITIVE	Culex tarsalis	LIGHT
S320003a	08/01/2017	Weld	MK-05	65	POSITIVE	Culex tarsalis	LIGHT
S320005a	08/01/2017	Weld	PL-04	65	POSITIVE	Culex tarsalis	LIGHT
S320008a	08/01/2017	Weld	JT-03	65	POSITIVE	Culex pipiens	LIGHT
S320009a	08/01/2017	Weld	MK-05	22	POSITIVE	Culex pipiens	LIGHT
S320009a	08/01/2017	Weld	PL-08	42	POSITIVE	Culex pipiens	LIGHT
S320071a	08/12/2017	Weld	PL-04	2	POSITIVE	Culex tarsalis	LIGHT
S320071a	08/12/2017	Weld	PL-08	22	POSITIVE	Culex tarsalis	LIGHT
S320071a	08/12/2017	Weld	VV-01	16	POSITIVE	Culex tarsalis	LIGHT
S320074a	08/12/2017	Weld	DC-01	52	POSITIVE	Culex tarsalis	LIGHT
S320075a	08/12/2017	Weld	DC-03	14	POSITIVE	Culex tarsalis	LIGHT
S320075a	08/12/2017	Weld	IC-01	35	POSITIVE	Culex tarsalis	LIGHT
S320077a	08/12/2017	Weld	DC-01	13	POSITIVE	Culex pipiens	LIGHT
S320077a	08/12/2017	Weld	DC-03	3	POSITIVE	Culex pipiens	LIGHT
S320077a	08/12/2017	Weld	FR-01	10	POSITIVE	Culex pipiens	LIGHT
S320077a	08/12/2017	Weld	IC-01	9	POSITIVE	Culex pipiens	LIGHT
S320146a	08/22/2017	Weld	GY-15	65	POSITIVE	Culex tarsalis	LIGHT
S320149a	08/22/2017	Weld	GY-03	16	POSITIVE	Culex tarsalis	LIGHT
S320149a	08/22/2017	Weld	GY-15	43	POSITIVE	Culex tarsalis	LIGHT
S320153a	08/22/2017	Weld	GY-03	16	POSITIVE	Culex pipiens	LIGHT
S320153a	08/22/2017	Weld	GY-15	46	POSITIVE	Culex pipiens	LIGHT
S320153a	08/22/2017	Weld	LS-01	3	POSITIVE	Culex pipiens	LIGHT
S320156a	08/22/2017	Weld	MK-05	65	POSITIVE	Culex tarsalis	LIGHT
S320157a	08/22/2017	Weld	MK-05	65	POSITIVE	Culex tarsalis	LIGHT
S320158a	08/22/2017	Weld	JT-03	13	POSITIVE	Culex tarsalis	LIGHT
S320158a	08/22/2017	Weld	MK-05	25	POSITIVE	Culex tarsalis	LIGHT
S320160a	08/22/2017	Weld	PL-04	20	POSITIVE	Culex tarsalis	LIGHT
S320160a	08/22/2017	Weld	PL-08	24	POSITIVE	Culex tarsalis	LIGHT
S320160a	08/22/2017	Weld	VV-01	7	POSITIVE	Culex tarsalis	LIGHT
S320165a	08/22/2017	Weld	FL-11	65	POSITIVE	Culex tarsalis	LIGHT
S320169a	08/22/2017	Weld	DC-03	35	POSITIVE	Culex tarsalis	LIGHT
S320169a	08/22/2017	Weld	FL-11	12	POSITIVE	Culex tarsalis	LIGHT
S320169a	08/22/2017	Weld	FR-01	18	POSITIVE	Culex tarsalis	LIGHT

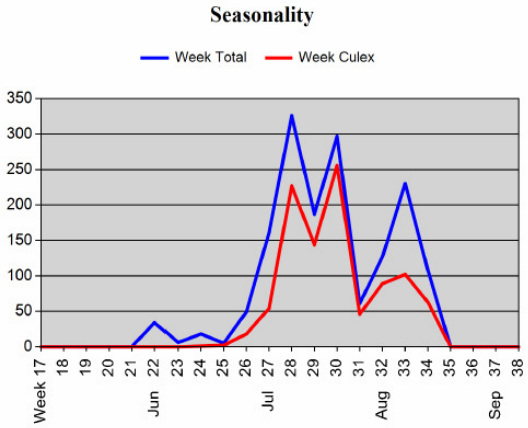
Appendix 2: Johnstown Individual Light Trap Summaries

JT-03 Johnstown Central Rolling Hills Ranch

Total number of trap/nights set:	14
Total number of mosquitoes collected:	1,670
Average mosquitoes per trap/night:	119
Average Culex per trap/night:	75

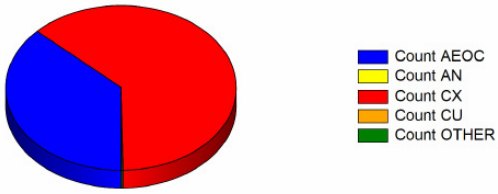
Species collected and abundance:

Aedes (Oc.) dorsalis	190	11.4 %
Aedes (Oc.) melanimon	6	0.4 %
Aedes vexans	422	25.3 %
Coquillettidia perturbans	4	0.2 %
Culex pipiens	188	11.3 %
Culex salinarius	37	2.2 %
Culex tarsalis	822	49.2 %
Culiseta inornata	1	0.1 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	618	37.0 %
Anopheles	0	0.0 %
Culex	1,047	62.7 %
Culiseta	1	0.1 %
Other	4	0.2 %

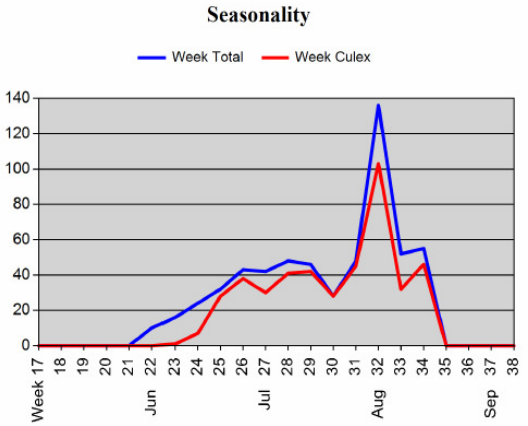


JT-04 Johnstown West Johnstown Reservoir

Total number of trap/nights set:	13
Total number of mosquitoes collected:	580
Average mosquitoes per trap/night:	45
Average Culex per trap/night:	34

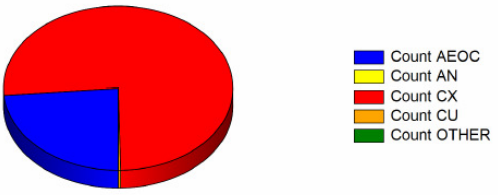
Species collected and abundance:

Aedes (Oc.) dorsalis	16	2.8 %
Aedes (Oc.) melanimon	2	0.3 %
Aedes vexans	119	20.5 %
Culex pipiens	122	21.0 %
Culex salinarius	30	5.2 %
Culex tarsalis	289	49.8 %
Culiseta inornata	2	0.3 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	137	23.6 %
Anopheles	0	0.0 %
Culex	441	76.0 %
Culiseta	2	0.3 %
Other	0	0.0 %

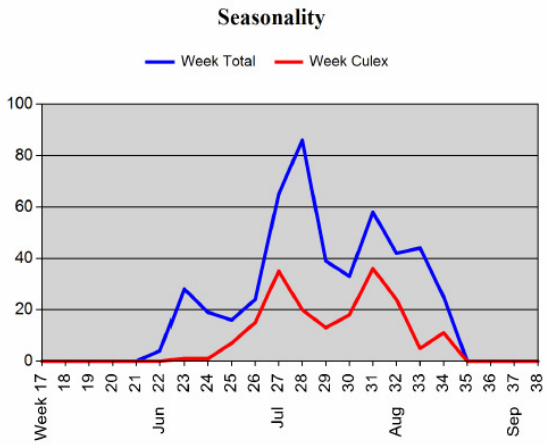


JT-05 Johnstown East - 237 2nd St

Total number of trap/nights set:	13
Total number of mosquitoes collected:	483
Average mosquitoes per trap/night:	37
Average Culex per trap/night:	14

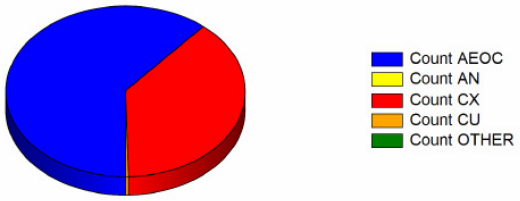
Species collected and abundance:

Aedes (Oc.) dorsalis	29	6.0 %
Aedes (Oc.) melanimon	3	0.6 %
Aedes vexans	264	54.7 %
Culex pipiens	58	12.0 %
Culex salinarius	4	0.8 %
Culex tarsalis	123	25.5 %
Culiseta inornata	2	0.4 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	296	61.3 %
Anopheles	0	0.0 %
Culex	185	38.3 %
Culiseta	2	0.4 %
Other	0	0.0 %

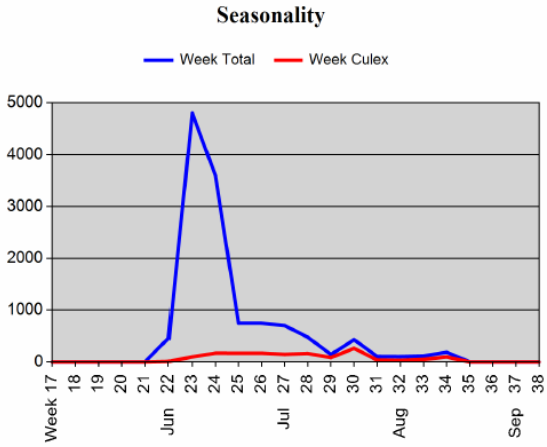


JT-06 Johnstown Thompson River Ranch

Total number of trap/nights set:	12
Total number of mosquitoes collected:	11,847
Average mosquitoes per trap/night:	987
Average Culex per trap/night:	108

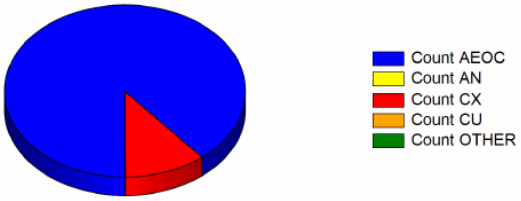
Species collected and abundance:

Aedes (Oc.) dorsalis	33	0.3 %
Aedes (Oc.) melanimon	47	0.4 %
Aedes (Oc.) trivittatus	13	0.1 %
Aedes vexans	10448	88.2 %
Culex pipiens	224	1.9 %
Culex salinarius	24	0.2 %
Culex tarsalis	1051	8.9 %
Culiseta inornata	7	0.1 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	10,541	89.0 %
Anopheles	0	0.0 %
Culex	1,299	11.0 %
Culiseta	7	0.1 %
Other	0	0.0 %

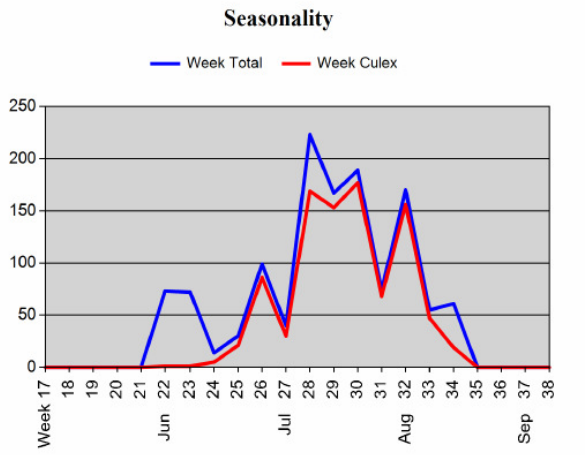


JT-07 Johnstown Pioneer Ridge

Total number of trap/nights set:	13
Total number of mosquitoes collected:	1,267
Average mosquitoes per trap/night:	97
Average Culex per trap/night:	72

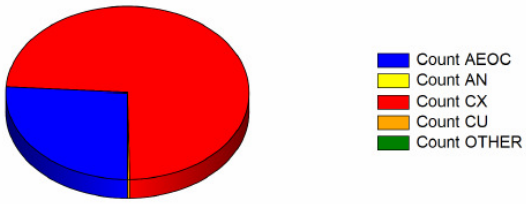
Species collected and abundance:

Aedes (Oc.) dorsalis	74	5.8 %
Aedes (Oc.) melanimon	1	0.1 %
Aedes (Oc.) trivittatus	6	0.5 %
Aedes vexans	249	19.7 %
Culex pipiens	190	15.0 %
Culex salinarius	58	4.6 %
Culex tarsalis	685	54.1 %
Culiseta inornata	4	0.3 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	330	26.0 %
Anopheles	0	0.0 %
Culex	933	73.6 %
Culiseta	4	0.3 %
Other	0	0.0 %



Appendix 3: Adult Mosquito Surveillance Trap Genus Summaries

Vector Disease Control International

Adult Trap Data - Genus Summary

Trap #	Type	County	Date		Ae/Oc	An	Cx	Cs		Other	TOTAL
JT-03	LIGHT	Weld	06/06/2017	Johnstown Central Rolling	34	0	0	0	0		34
JT-03	LIGHT	Weld	06/13/2017	Johnstown Central Rolling	6	0	0	0	0		6
JT-03	LIGHT	Weld	06/20/2017	Johnstown Central Rolling	17	0	1	0	0		18
JT-03	LIGHT	Weld	06/27/2017	Johnstown Central Rolling	3	0	2	0	0		5
JT-03	LIGHT	Weld	07/06/2017	Johnstown Central Rolling	31	0	18	0	0		49
JT-03	LIGHT	Weld	07/11/2017	Johnstown Central Rolling	107	0	54	0	0		161
JT-03	LIGHT	Weld	07/18/2017	Johnstown Central Rolling	99	0	227	0	0		326
JT-03	LIGHT	Weld	07/25/2017	Johnstown Central Rolling	43	0	144	0	0		187
JT-03	LIGHT	Weld	08/01/2017	Johnstown Central Rolling	41	0	256	0	0		297
JT-03	LIGHT	Weld	08/10/2017	Johnstown Central Rolling	13	0	62	0	4		79
JT-03	LIGHT	Weld	08/12/2017	Johnstown Central Rolling	14	0	29	0	0		43
JT-03	LIGHT	Weld	08/15/2017	Johnstown Central Rolling	38	0	89	0	0		127
JT-03	LIGHT	Weld	08/22/2017	Johnstown Central Rolling	127	0	102	1	0		230
JT-03	LIGHT	Weld	08/29/2017	Johnstown Central Rolling	45	0	63	0	0		108
JT-04	LIGHT	Weld	06/08/2017	Johnstown West	10	0	0	0	0		10
JT-04	LIGHT	Weld	06/15/2017	Johnstown West	15	0	1	0	0		16
JT-04	LIGHT	Weld	06/22/2017	Johnstown West	17	0	7	0	0		24
JT-04	LIGHT	Weld	06/29/2017	Johnstown West	3	0	28	1	0		32
JT-04	LIGHT	Weld	07/07/2017	Johnstown West	4	0	38	1	0		43
JT-04	LIGHT	Weld	07/13/2017	Johnstown West	12	0	30	0	0		42
JT-04	LIGHT	Weld	07/20/2017	Johnstown West	7	0	41	0	0		48
JT-04	LIGHT	Weld	07/27/2017	Johnstown West	4	0	42	0	0		46
JT-04	LIGHT	Weld	08/03/2017	Johnstown West	0	0	28	0	0		28
JT-04	LIGHT	Weld	08/10/2017	Johnstown West	3	0	45	0	0		48
JT-04	LIGHT	Weld	08/17/2017	Johnstown West	33	0	103	0	0		136
JT-04	LIGHT	Weld	08/24/2017	Johnstown West	20	0	32	0	0		52
JT-04	LIGHT	Weld	08/31/2017	Johnstown West	9	0	46	0	0		55
JT-05	LIGHT	Weld	06/08/2017	Johnstown East - 237 2nd	4	0	0	0	0		4
JT-05	LIGHT	Weld	06/15/2017	Johnstown East - 237 2nd	27	0	1	0	0		28
JT-05	LIGHT	Weld	06/22/2017	Johnstown East - 237 2nd	19	0	0	0	0		19
JT-05	LIGHT	Weld	06/29/2017	Johnstown East - 237 2nd	9	0	7	0	0		16
JT-05	LIGHT	Weld	07/07/2017	Johnstown East - 237 2nd	9	0	15	0	0		24
JT-05	LIGHT	Weld	07/13/2017	Johnstown East - 237 2nd	30	0	35	0	0		65
JT-05	LIGHT	Weld	07/20/2017	Johnstown East - 237 2nd	66	0	20	0	0		86
JT-05	LIGHT	Weld	07/27/2017	Johnstown East - 237 2nd	26	0	13	0	0		39
JT-05	LIGHT	Weld	08/03/2017	Johnstown East - 237 2nd	15	0	18	0	0		33
JT-05	LIGHT	Weld	08/10/2017	Johnstown East - 237 2nd	21	0	36	1	0		58
JT-05	LIGHT	Weld	08/17/2017	Johnstown East - 237 2nd	18	0	24	0	0		42
JT-05	LIGHT	Weld	08/24/2017	Johnstown East - 237 2nd	38	0	5	1	0		44
JT-05	LIGHT	Weld	08/31/2017	Johnstown East - 237 2nd	14	0	11	0	0		25
JT-06	LIGHT	Larimer	06/08/2017	Johnstown Thompson	440	0	10	0	0		450
JT-06	LIGHT	Larimer	06/15/2017	Johnstown Thompson	4704	0	96	0	0		4,800
JT-06	LIGHT	Larimer	06/22/2017	Johnstown Thompson	3432	0	168	0	0		3,600
JT-06	LIGHT	Larimer	06/29/2017	Johnstown Thompson	580	0	167	1	0		748
JT-06	LIGHT	Larimer	07/07/2017	Johnstown Thompson	0	0	0	0	0		0
JT-06	LIGHT	Larimer	07/13/2017	Johnstown Thompson	555	0	145	0	0		700
JT-06	LIGHT	Larimer	07/20/2017	Johnstown Thompson	314	0	161	0	0		475
JT-06	LIGHT	Larimer	07/27/2017	Johnstown Thompson	59	0	83	1	0		143
JT-06	LIGHT	Larimer	08/03/2017	Johnstown Thompson	165	0	262	1	0		428
JT-06	LIGHT	Larimer	08/10/2017	Johnstown Thompson	68	0	35	1	0		104
JT-06	LIGHT	Larimer	08/17/2017	Johnstown Thompson	71	0	28	2	0		101
JT-06	LIGHT	Larimer	08/24/2017	Johnstown Thompson	64	0	49	0	0		113
JT-06	LIGHT	Larimer	08/31/2017	Johnstown Thompson	89	0	95	1	0		185
JT-07	LIGHT	Weld	06/08/2017	Johnstown Stroh Farm	71	0	1	1	0		73
JT-07	LIGHT	Weld	06/15/2017	Johnstown Stroh Farm	70	0	1	1	0		72
JT-07	LIGHT	Weld	06/22/2017	Johnstown Stroh Farm	9	0	5	0	0		14
JT-07	LIGHT	Weld	06/29/2017	Johnstown Stroh Farm	9	0	21	0	0		30
JT-07	LIGHT	Weld	07/07/2017	Johnstown Stroh Farm	13	0	86	0	0		99
JT-07	LIGHT	Weld	07/13/2017	Johnstown Stroh Farm	10	0	30	0	0		40
JT-07	LIGHT	Weld	07/20/2017	Johnstown Stroh Farm	54	0	169	0	0		223
JT-07	LIGHT	Weld	07/27/2017	Johnstown Stroh Farm	14	0	153	0	0		167
JT-07	LIGHT	Weld	08/03/2017	Johnstown Stroh Farm	11	0	177	1	0		189
JT-07	LIGHT	Weld	08/10/2017	Johnstown Stroh Farm	6	0	68	0	0		74
JT-07	LIGHT	Weld	08/17/2017	Johnstown Stroh Farm	14	0	156	0	0		170
JT-07	LIGHT	Weld	08/24/2017	Johnstown Stroh Farm	8	0	47	0	0		55
JT-07	LIGHT	Weld	08/31/2017	Johnstown Stroh Farm	41	0	19	1	0		61
					11,922		3,905		4		
						0		16			15,847