

## Appendix A:

### Kern County Schools with Gardens

Vision 1: Healthy, Empowered Food Consumers

- **Goal 1:** Kern County students (K-12) have access to nutrition education and hands-on opportunities to learn about the food system
  - **Indicator 1:** Access to school gardens in Kern County
    - **Measure 1:** Number of school gardens in Kern County
    - **Measure 2:** Percentage of students attending schools with school gardens.

Schools that have a garden	Number of Students Enrolled (2014-15)	City	District
Bear Mountain Elementary (ASP)	720	Arvin	Arvin Union School District
El Camino Real Elementary (ASP)	871	Arvin	Arvin Union School District
Sierra Vista Elementary (ASP)	778	Arvin	Arvin Union School District
Cesar Chavez Elementary (Magnet Program)	642	Bakersfield	Bakersfield City School District
College Heights Elementary	884	Bakersfield	Bakersfield City School District
Henry Eissler Elementary (ASP)	625	Bakersfield	Bakersfield City School District
Franklin Elementary	479	Bakersfield	Bakersfield City School District
Fremont Elementary	893	Bakersfield	Bakersfield City School District
Thorner Elementary	874	Bakersfield	Bakersfield City School District
Voorhies Elementary	967	Bakersfield	Bakersfield City School District
William Penn Elementary (ASP)	286	Bakersfield	Bakersfield City School District
Buttonwillow Union School	343	Buttonwillow	Buttonwillow Union School District
Elk Hills Elementary	203	Tupman	Elk Hills School District
Fairfax Jr High (ASP)	504	Bakersfield	Fairfax Elementary School District
Virginia Elementary (ASP)	675	Bakersfield	Fairfax Elementary School District
Fruitvale Jr. High	711	Bakersfield	Fruitvale School District
North High School FFA Program	1585	Bakersfield	Kern High School District
Wallace Middle	331	Lake Isabella	Kernville Union School District
Lamont Elementary Special Ed	642	Lamont	Lamont Elementary
Lost Hills Elementary	422	Lost Hills	Lost Hills Union School District
Castle Elementary	704	Bakersfield	Panama Buena Vista Union School District
Reagan Elementary	942	Bakersfield	Panama Buena Vista Union School District
Thompson Jr High	741	Bakersfield	Panama Buena Vista Union School District
Van Horn Elementary (ASP)	575	Bakersfield	Panama Buena Vista Union School District
Rosedale Middle School	651	Bakersfield	Rosedale Union School District
Rare Earth Continuation High School	52	Rosamond	Southern Kern Unified School District
Conley Elementary ASP/Teachers garden	272	Taft	Taft City School District

Schools that have a garden	Number of Students Enrolled (2014-15)	City	District
Sunset Child Development Center	350	Bakersfield	Vineland School District
Vineland Elementary	473	Bakersfield	Vineland School District
Teresa Burke Elementary	803	Wasco	Wasco Union Elementary School District
Beardsley Jr High (Special Ed)	325	Bakersfield	Beardsley School District
Grimmway Academy (Charter)	513	Arvin	Partnership with Panama Buena Vista Union
Valley Oaks (Charter)	680	Bakersfield	Kern County Superintendent of Schools
Wonderful College Prep Academy (Charter)	875	Delano	Kern County Office of Education

Total Students Enrolled in Schools that have Garden	21,391
Total Students Enrolled in Kern County Schools (2014-15)*	182,372
Percentage of Students attending school with garden (2014-15)	12%
* 180,304 (from CA Dept of Ed) + 513 (Grimmway) + 680 (Valley Oaks) + 875 (Wonderful)	

Source: Karen Bayne at UCCE Kern County; CA Dept of Education, Educational Demographics Unit

## Appendix B:

### Food Systems Job Categories

#### Vision 2: Healthy Local Food Economy

- **Goal 3:** Kern County's food system provides job opportunities
  - **Indicator 1:** Average wages in the Kern County food system
  - **Indicator 2:** Number of jobs in the Kern County food system

The North American Industry Classification System (NAICS) is the standard used by Federal agencies to classify business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

NAICS	1111	Oilseed and grain farming
NAICS	1112	Vegetable and melon farming
NAICS	1113	Fruit and tree nut farming
NAICS	1114	Greenhouse and nursery production
NAICS	1119	Other crop farming
NAICS	1121	Cattle ranching and farming
NAICS	1122	Hog and pig farming
NAICS	1123	Poultry and egg production
NAICS	1124	Sheep and goat farming
NAICS	1125	Aquaculture
NAICS	1129	Other animal production
NAICS	1151	Support activities for crop production
NAICS	1152	Support activities for animal production
NAICS	3111	Animal food manufacturing
NAICS	3112	Grain and oilseed milling
NAICS	3113	Sugar and confectionery product manufacturing
NAICS	3114	Fruit and Vegetable preserving and specialty

NAICS	3115	Dairy product manufacturing
NAICS	3116	Animal slaughtering and processing
NAICS	3117	Seafood preparation and packaging
NAICS	3118	Bakeries and tortilla manufacturing
NAICS	3119	Other food manufacturing
NAICS	3121	Beverage manufacturing
NAICS	4244	Grocery and related product wholesalers
NAICS	4245	Farm product raw material merchant wholesalers
NAICS	4248	Alcoholic beverage merchant wholesalers
NAICS	4451	Grocery stores
NAICS	4452	Specialty food stores
NAICS	4453	Beer, wine, and liquor stores
NAICS	7223	Special food services
NAICS	7224	Drinking places, alcoholic beverages
NAICS	7225	Restaurants and other eating places

## Appendix C:

### Microbial Pesticides

#### Vision 3: Healthy Farms and Environment

- **Goal 3:** Kern County reduces risks associated with pesticide use
  - **Indicator 1:** Adoption of integrated pest management (IPM) practices
    - **Measure 1:** Use of microbial pesticides

The following list of microbial pesticides was retrieved using the “active ingredient class” query tool in PURWebGIS (<http://ziram.lawr.ucdavis.edu/PURwebGIS.html>). The exact products used will vary by year and county. This is a list of all microbial pesticide products used in the state of California in 2014. Not all have necessarily been used in Kern County.

Agrobacterium Radiobacter	Bacillus Thuringiensis, Subsp. Kurstaki, Strain Hd-1
Agrobacterium Radiobacter, Strain K1026	Bacillus Thuringiensis Subspecies Kurstaki, Genetically Engineered Strain Eg7841 Lepidopteran Active Toxin
Aspergillus Flavus Strain Af36	Beauveria Bassiana Strain Gha
Bacillus Pumilus, Strain Qst 2808	Codling Moth Granulosis Virus
Bacillus Sphaericus, Serotype H-5a5b, Strain 2362	Coniothyrium Minitans Strain Con/M/91-08
Bacillus Subtilis Gb03	Gliocladium Virens Gl-21 (Spores)
Bacillus Subtilis Mbi600	Metarhizium Anisopliae Strain F52
Bacillus Thuringiensis (Berliner)	Myrothecium Verrucaria, Dried Fermentation Solids & Solubles, Strain Aarc-0255
Bacillus Thuringiensis (Berliner), Subsp. Aizawai, Gc-91 Protein	Nosema Locustae Spores
Bacillus Thuringiensis (Berliner), Subsp. Aizawai, Serotype H-7	Paecilomyces Fumosoroseus Apopka Strain 97
Bacillus Thuringiensis (Berliner), Subsp. Israelensis, Serotype H-14	Polyhedral Occlusion Bodies (Ob'S) Of the Nuclear Polyhedrosis Virus of Helicoverpa Zea (Corn Earworm)
Bacillus Thuringiensis (Berliner), Subsp. Kurstaki, Serotype 3a, 3b	Pseudomonas Fluorescens, Strain A506
Bacillus Thuringiensis (Berliner), Subsp. Kurstaki, Strain Eg 2348	Qst 713 Strain of Dried Bacillus Subtilis
Bacillus Thuringiensis (Berliner), Subsp. Kurstaki, Strain Sa-11	Reynoutria Sachalinensis
Bacillus Thuringiensis (Berliner), Subsp. Kurstaki Strain Sa-12	Streptomyces Griseoviridis Strain K61
Bacillus Thuringiensis, Subsp. Aizawai, Strain Abts-1857	Streptomyces Lydicus Wyec 108
Bacillus Thuringiensis, Subsp. Aizawai, Strain Sd-1372, Lepidopteran Active Toxin(S)	Trichoderma Harzianum Rifai Strain Krl-Ag2
Bacillus Thuringiensis, Subsp. Israelensis, Strain Am 65-52	Trichoderma Icc 012 Asperellum
Bacillus Thuringiensis, Subsp. Kurstaki, Strain Abts-351, Fermentation Solids and Solubles	Trichoderma Icc 080 Gamsii
	Ulocladium Oudemansii (U3 Strain)

## Appendix D:

### Pheromone Pesticides

#### Vision 3: Healthy Farms and Environment

- **Goal 3:** Kern County reduces risks associated with pesticide use
  - **Indicator 1:** Adoption of integrated pest management (IPM) practices
    - **Measure 1:** Use of pheromone pest control products

The following list of pheromone pest control products was retrieved using the “active ingredient class” query tool in PURWebGIS (<http://ziram.lawr.ucdavis.edu/PURwebGIS.html>). The exact products used will vary by year and county. This is a list of all pheromone pesticide products used in the state of California in 2014. Not all have necessarily been used in Kern County.

(3s, 6r)-3-Methyl-6-Isopropenyl-9-Decen-1-Yl Acetate
(3s, 6s)-3-Methyl-6-Isopropenyl-9-Decen-1-Yl Acetate
(E)-4-Tridecen-1-Yl-Acetate
(E)-5-Decen-1-ol
(E)-5-Decenol
(E)-5-Decenyl Acetate
(E,Z)-7,9-Dodecadien-1-Yl Acetate
(Z)-4-Tridecen-1-Yl-Acetate
(Z)-9-Dodecenyl Acetate
(Z,Z)-11,13-Hexadecadienal
1,7-Dioxaspiro-(5,5)-Undecane
3,13-Octadecadien-1-Yl Acetate
E,E-8,10-Dodecadien-1-ol
E-11-Tetradecen-1-Yl Acetate
E-8-Dodecenyl Acetate
Farnesol
Nerolidol
Z-11-Tetradecen-1-Yl Acetate
Z-8-Dodecenol
Z-8-Dodecenyl Acetate

## Appendix E:

### Pesticide Risk Categories

Vision 3: Healthy Farms and Environment

- **Goal 2:** Kern County reduces risks associated with pesticide use
  - **Indicator 1:** Adoption of integrated pest management (IPM) practices
  - **Measure 3:** Use of pesticides by estimated risk level

#### Higher Risk Pesticides – Non-fumigants

All pesticides included on the CalEnviroScreen 2.0's list of hazardous and volatile pesticides were categorized as "higher risk" in our analysis. This was a total of 69 pesticides, of which 59 were non-fumigants.

2,2-Dibromo-3-nitrilopropionamide (DBNPA)
2,2-dichlorovinyl dimethyl phosphate (DDVP, Dichlorvos)
Acephate
Acrolein
Aldicarb
Azinphos-methyl (Guthion)
Bromoxynil heptanoate
Bromoxynil octanoate
Buprofezin
Carbaryl (Sevin)
Carbofuran
Chlorothalonil
Chlorpyrifos
Chlorthal-dimethyl (DCPA, Dacthal)
Ciprodinil
Clomazone
Cycloate (Ro-Neet)
Diazinon
Dichloran
Dimethoate
Dimethyl disulfide (Paladin)
Endosulfan*
Ethalfuralin
Ethoprop
Fenamiphos
Fenpropathrin
Fenthion
Fludioxonil
Flumioxazin

Fosthiazate
Hydrogen cyanamide
Imazalil
Linuron
Malathion
Metalaxyl
Methamidophos (Monitor)
Methidathion
Methomyl
Methyl isothiocyanate
Methyl parathion
Metrafenone
Molinate
Myclobutanil
Naled
Oxydemeton-methyl
Pendachloronitrobenzene (PCNB)
Propetamphos
Propoxur (Baygon)
Pyrimethanil
S,S,S-Tributyl phosphorotrithioate (DEF)
S-Ethyl dipropylthiocarbamate (EPTC)
Sodium cyanide
Sulfur dioxide
Thiram
Triclopyr, butoxyethyl ester (TBEE)
Triclopyr, triethylamine salt (TEA)
Triflumizole
Trifluralin
Ziram

### Higher Risk Pesticides – Fumigants

All pesticides included on the CalEnviroScreen 2.0's list of hazardous and volatile pesticides were categorized as "higher risk" in our analysis. This was a total of 69 pesticides, of which 10 were fumigants.

1,3-Dichloropropene (Telone)
Chloropicrin
Dazomat
Metam-potassium (Potassium N-methyldithiocarbamate)
Metam-sodium
Methyl bromide
Phosphine
Propylene oxide
Sodium tetrathiocarbonate
Sulfuryl fluoride

### Lower Risk Pesticides

All pesticides registered for use in California that were not included on the CalEnviroScreen 2.0's list of hazardous and volatile pesticides were included in our analysis as "lower risk pesticides." In 2014 this was a total of 263 pesticides, though this may vary slightly from year to year as pesticides are newly registered or removed from registration.

## Appendix F:

### California Code of Regulations, Title 3, Division 6, Chapter 1, Subchapter 3, Article 1

Vision 3: Healthy Farms and Environment

- Goal 3: Kern County reduces risks associated with pesticide use
  - Indicator 1: Adherence to pesticide use regulations
  - Measure 3: CDPR enforcement actions related to worker safety

### California Code of Regulations (Title 3. Food and Agriculture) Division 6. Pesticides and Pest Control Operations

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#### Division 6. Pesticides and Pest Control Operations Chapter 1. Pesticide Regulatory Program Subchapter 3. Agricultural Commissioner Penalties Article 1. Guidelines

##### **6128. Enforcement Response to Violations.**

(a) The commissioner shall comply with the provisions of this section each time an incident or violation of law or regulation occurs related to agricultural or structural use of pesticides or any use of a fumigant, to determine the appropriate enforcement response.

(b) For purposes of this section, and sections 6130 and 6131, the following terms are defined as follows:

“Compliance action” is an action that documents that certain behavior or an act is in violation of the law or regulations. The documentation may or may not allege the recipient committed the violation at issue. Compliance actions do not directly impose a monetary penalty. Compliance actions include violation notice; warning letter; documented compliance interview; or noncompliance noted on an inspection form. Compliance actions also include public protection actions such as cease and desist orders; seize or hold product or produce orders; and prohibit harvest orders.

“Decision report” is a written record of the basis for a commissioner’s decision not to take an enforcement action.

“Enforcement action” is an action with the potential to impose a monetary penalty or loss of a right or privilege initiated by a Notice of Proposed Action. Enforcement actions include administrative civil penalty; or disciplinary action (refuse, suspend, or revoke) against a county registration, certificate, or permit.

“Incident” is an occurrence in which one or more violations are discovered. An incident may be a single inspection or audit, a set of two or more inspections or audits related to the occurrence, or a pesticide episode investigation.

(c) After determining the violation class specified in Title 3, California Code of Regulations section 6130 or Title 16, California Code of Regulations section 1922, the commissioner shall respond to each incident with one or more of the enforcement responses listed below.

(1) Class A or Serious Violation

(A) A formal referral to the District Attorney, City Attorney, Circuit Prosecutor, or the Director or Structural Pest Control Board Registrar for a statewide licensing action.



(B) An enforcement action. If the enforcement response initially selected by the commissioner was a formal referral but the referral was declined, then the commissioner shall proceed with this enforcement response.

(2) Class B or Moderate Violation

(A) A formal referral to the District Attorney, City Attorney, Circuit Prosecutor, or the Director or Structural Pest Control Board Registrar for a statewide licensing action.

(B) An enforcement action. If the enforcement response initially selected by the commissioner was a formal referral but the referral was declined, then the commissioner shall proceed with this enforcement response.

(C) A compliance action with a decision report, provided there has not been a violation in Class A or B within two years of the current violation. In some instances, a compliance action may be taken in addition to the enforcement response in (2)(A) or (B), in which case a decision report is not required.

(3) Class C or Minor Violation Enforcement Response.

(A) An enforcement action; or

(B) A compliance action.

(d) If a decision report is required, the commissioner shall submit the decision report to the Director, within 60 days of the date of the initial compliance action, for concurrence. If the Director does not concur with the commissioner's decision, the Director shall notify the commissioner within 30 days of receipt of the decision report with the specific reasons for denial, and an enforcement action shall be taken by the commissioner. The commissioner shall retain a copy of the decision report for two years. A decision report shall contain:

(1) The identification of the respondent or case;

(2) A summary of the incident or act;

(3) The section(s) violated;

(4) The class of each violation pursuant to Title 3, California Code of Regulations section 6130 or Title 16, California Code of Regulations section 1922;

(5) An explanation of the circumstances that justify not taking an enforcement action;

(6) The date of decision; and

(7) The name of the Agency official responsible for the decision.

(e) In the case of a priority investigation, as defined in the 2005 Cooperative Agreement, dated April 2005, between the California Department of Pesticide Regulation, the California Agricultural Commissioners and Sealers Association, and the U.S. Environmental Protection Agency, Region IX, except in cases of intentional ingestion, the commissioner shall provide an opportunity to the District Attorney, City Attorney, or Circuit Prosecutor to participate in the investigation and/or pursue a civil or criminal action when a violation may have occurred.

NOTE: Authority cited: Sections 2281, 11456, 12781, 12976, and 15203, Food and Agricultural Code. Reference: Sections 11892, 12996, 12997, 12999.5, and 15202, Food and Agricultural Code; and Section 8617, Business and Professions Code.

### **6130. Civil Penalty Actions by Commissioners.**

(a) When taking civil penalty action on incidents or violations related to agricultural or structural use of pesticides and all uses of fumigants pursuant to section 12999.5 of the Food and Agricultural Code, county agricultural commissioners shall use the provisions of this section to determine the violation class and the fine amount. This section may also be used to determine the violation class and fine amount for violations involving other uses of pesticides.

(b) County agricultural commissioners shall designate violations as "Class A," "Class B," or "Class C" using the following definitions:

(1) A Class A violation is one of the following:

(A) A violation that caused a health, property, or environmental hazard.

(B) A violation of a law or regulation that mitigates the risk of adverse health, property, or environmental effects, and the commissioner determines that one of the following aggravating circumstances support elevation to Class A.

1. The respondent has a history of violations;

2. The respondent failed to cooperate in the investigation of the incident or allow a lawful inspection; or,

3. The respondent demonstrated a disregard for specific hazards of the pesticide used;

(C) A violation of a lawful order of the commissioner issued pursuant to sections 11737, 11737.5, 11896, 11897, or 13102 of the Food and Agricultural Code.

(2) A Class B violation is a violation of a law or regulation that mitigates the risk of adverse health, property, or environmental effects that is not designated as Class A.

(3) A Class C violation is a violation of a law or regulation that does not mitigate the risk of an adverse health, property, or environmental effect, including, but not limited to, Title 3, California Code of Regulations, sections 6624 through 6628, and Food and Agricultural Code sections 11732, 11733, and 11761.

(c) The fine range for each class of violation is:

(1) Class A: \$700 to \$5,000.

(2) Class B: \$250 to \$1,000.

(3) Class C: \$50 to \$400.

(d) When determining the fine amount within the fine range, the commissioner shall use relevant facts, including severity of actual or potential effects and the respondent's compliance history, and include those relevant facts in the notice of proposed action.

(e) The commissioner shall send a copy of the notice of proposed action to the Director no later than the time the notice is provided to the respondent.

(f) If the respondent requested and appeared at the hearing offered by the commissioner, the commissioner's decision shall include information concerning the person's right to appeal the decision to the Director.

(g) The commissioner shall send a copy of the notice of final action to the Director no later than the time the notice is provided to the respondent.

Note: Authority cited: Sections 12781, 12976, and 15203, Food and Agricultural Code. Reference: Sections 11892, 12973, 12997, 12999.5, and 15202, Food and Agricultural Code; and Section 8617, Business and Professions Code.

### **6131. Actions Allowed Against Licensed or Certificated Employees.**

(a) When bringing an enforcement action against an employee who failed to use personal protective equipment or other safety equipment as required by section 6702(c) or a pesticide product's labeling, the commissioner shall determine that all of the following conditions are met:

(1) The employee person is licensed or certified pursuant to Chapter 14, Division 3, of the Business and Professions Code; Chapters 5 or 8, Division 6, of the Food and Agricultural Code; or Chapters 3.4 or 3.6, Division 7, of the Food and Agricultural Code;

(2) The employer provided the equipment to the employee and the equipment was available at the work site in a condition that would have provided the safety or protection intended by the equipment;

(3) The employer has implemented a written workplace disciplinary action policy requiring the employee to use the equipment;

(4) The employee has acknowledged by signature having read and understood the employer's written workplace disciplinary action policy for failure to use the equipment; and,

(5) The employer has complied with applicable training requirements of this Division prior to the time the employee failed to use the equipment.

(b) A Notice of Proposed Action to fine an employee for failure to use personal protective equipment must include a copy of the text of subsection (a).

NOTE: Authority cited: Sections 12781, 12976, and 15203, Food and Agricultural Code. Reference: Sections 11892, 12973, 12997, and 15202, Food and Agricultural Code; and Section 8616.9, Business and Professions Code.

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## Appendix G:

### Surface Water Monitoring Stations in Kern County

#### Vision 3: Healthy Farms and Environment

- **Goal 3:** Kern County's water resources are conserved and support ecosystem health
  - **Indicator 1:** Dissolved nitrate in Kern County water systems
    - **Measure 1:** Dissolved nitrate detected in Kern County surface water

The following table shows all the surface water quality monitoring stations in Kern County that were included in our analysis. These include all stations sampled for nitrate at least once in Kern County between 1972 and 2013. This station list was generated by the California Department of Water Resource's Water Data Library.

The largest number of water samples for nitrate came from four stations – CALIFORNIA AQU A A.D. EDMONSTON (sampled 1972-1990, 2006), CALIFORNIA AQU A CHECK 29 (sampled 1972-2013), CALIFORNIA AQUEDUCT AT CHECK 41 (sampled 1988-2013), and COASTAL B A CHECK 5 (sampled 1972-1990).

Station numbers with a single asterisk\* beside them were sampled for nitrate in less than 5 years total between 1972 and 2013.

Station numbers with a double asterisk\*\* beside them were sampled for nitrate in 2013.

"Pump-In Projects" are sites where local groundwater is introduced into the State Water Project (SWP). The pump-in stations on this list may include a mix of both surface and groundwater.<sup>1</sup>

Long Station Name	Short Station Name	Station Number
Arvin Edison Pump in	AE Pump in	GKA02773**
Cal Aqu at mi 197.05, Check 23	Check 23	KA019705**
Cal Aqu at mi 209.80, Semi Tropic Turnout	Semitropic pump-in	KA020980*
Cal Aqu at mi 241.02, Kern River Intertie	KA024102	KA024102*
CALIFORNIA AQU A A.D. EDMONSTON	KA029339	KA029339
CALIFORNIA AQU A CHECK 29	Check 29	KA024454**
CALIFORNIA AQUEDUCT AT CHECK 24	KA020794	KA020794**
CALIFORNIA AQUEDUCT AT CHECK 28	KA023811	KA023811**
CALIFORNIA AQUEDUCT AT CHECK 41	Check 41	KA030341
Check 25	Check 25	KA021779**
Check 27	Check 27	KA023173**
Check 39	Check 39	KA029021
COASTAL B A CHECK 5	KC001220	KC001220
CROSS VALLEY CANAL	Cross Valley Canal	GKA23805*
Cross Valley Canal Pumpin	Cross Valley	GKA02380* **
DEVILS DEN	Check 4	KC000934
Kern Water Bank Pump in	KWB pump in	GKA02382**

<sup>1</sup> California Department of Water Resources, Division of O&M, O&M Pump-In Project Monitoring. Retrieved April 11, 2016 from <http://www.water.ca.gov/swp/waterquality/Pumplns/index.cfm/>

Long Station Name	Short Station Name	Station Number
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA26966	GKA26966*
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA27210	GKA27210*
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA27231	GKA27231*
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA27253	GKA27253*
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA27280	GKA27280*
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA27375	GKA27375*
NON-PROJECT IMPORT STATION (WHEELER RIDGE)	GKA27728	GKA27728*
Semi Tropic 3 arsenic monitoring	Semi Tropic 3 Pumpin	KA020699*
Semitropic 2 turn in	Semitropic 2 pump in	GKA02098**
Semitropic 3 turnin	Semitropic 3 pump in	GKA02070**
West Kern 3	WK 3	KA022407*
West Kern Pumpin	West Kern Pumpin	GKA24002* **
Wheeler Ridge pumpin 270.24	WRM pumpin 270.24	GKA27024*
Wheeler Ridge pumpin 276.09	WRM pumpin 276.09	GKA27609*
Wheeler Ridge pumpin 280.14	WRM pumpin 280.14	GKA28014*
Wheeler Ridge pumpin 286.89	WRM pumpin 286.89	GKA28689*

## Appendix H:

### Groundwater Sampling in Kern County

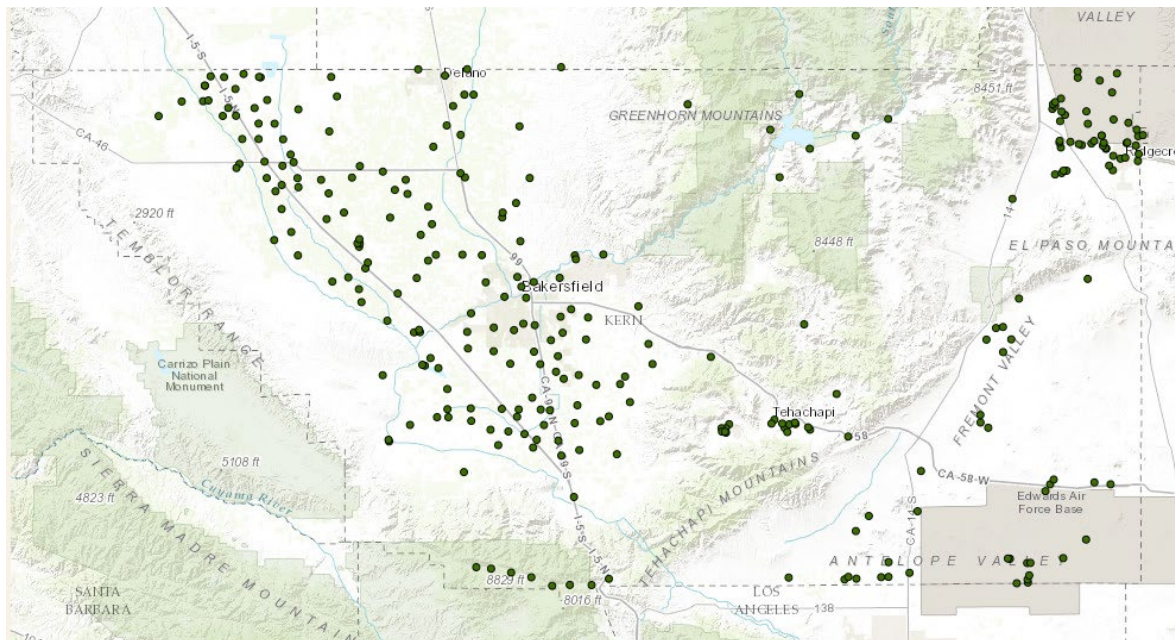
Vision 3: Healthy Farms and Environment

- **Goal 3:** Kern County's water resources are conserved and support ecosystem health
  - **Indicator 1:** Dissolved nitrate in Kern County water systems
    - **Measure 2:** Dissolved nitrate detected in Kern County groundwater

The following map shows the location of USGS groundwater sampling sites in Kern County from 1980 to 2014.

#### Groundwater sampling sites in Kern County 1980-2014

Source: The Water Quality Portal (sponsored by the United States Geological Survey (USGS), United States Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC)<sup>1</sup>



The following figure shows the total number of samples tested each year and the percentage of those samples in which nitrate was detected at any level, including many samples safely below the maximum contaminant level (MCL) of 45 mg/L.

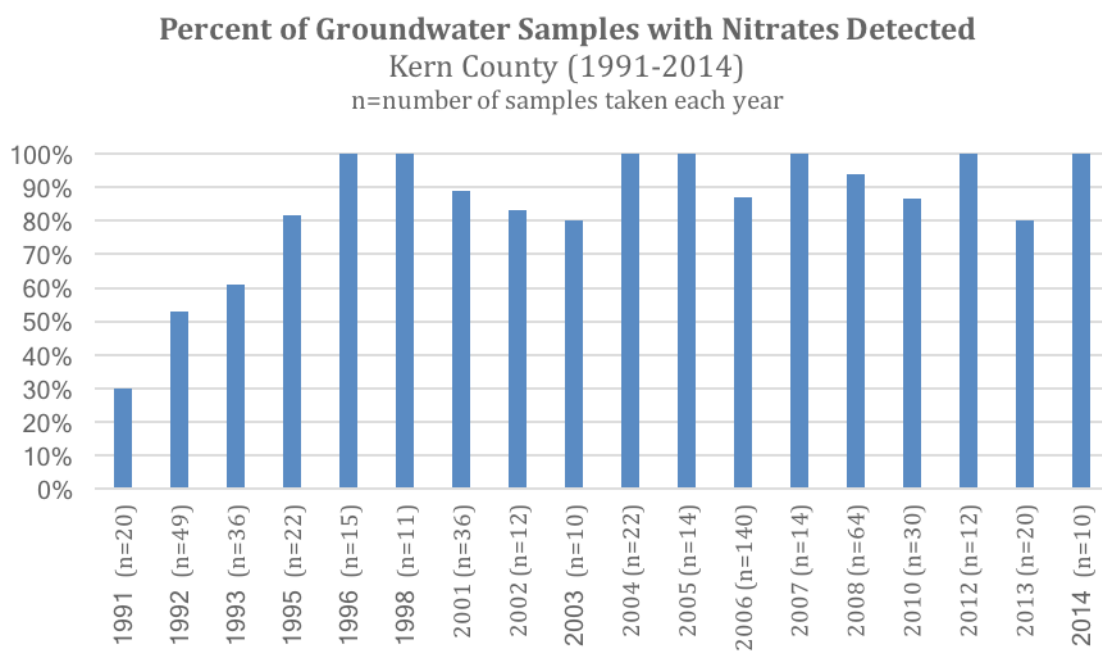
This figure does not give any information about nitrate levels in groundwater, but is provided as context for the data in the main text (Figure 50: Dissolved nitrates in Kern County groundwater 1991-2013).

Depending on the method of sampling, the amount of nitrate in water required for detection ranges from 0.443 to 4.43 mg/L. Natural background levels of nitrate in groundwater can be as high as 8.9 mg/L.

<sup>1</sup> The Water Quality Portal serves data collected from 400 state, federal, tribal, and local agencies

### Percentage of groundwater samples in which nitrates were detected in Kern County (1991-2014)

Source: Source: United States Geological Survey (USGS), National Water Information System (NWIS), queried via the Water Quality Portal (WQP), a collaborative tool of the National Water Quality Monitoring Council, the USGS, and the EPA.





## Appendix I:

### Annual Evapotranspiration Values for California Crops (ETc)

#### Vision 3: Healthy Farms and Environment

- **Goal 3:** Kern County's water resources are conserved and support ecosystem health
  - **Indicator 2:** Agricultural water use in Kern County
    - **Measure 2:** Average water requirements of harvested crops in Kern County

The ETc values used in this report were developed by California Polytechnic State University's Irrigation Training and Research Center (ITRC) using the method outlined by the Food and Agriculture Organization of the United Nations (FAO).<sup>1</sup> Values for additional crop types in wet, dry, and average years can be viewed on IRTC's website.<sup>2</sup> The Kern County Food Systems Assessment uses dry year ETc values.

ETc values are commonly expressed in acre inches of water, or the amount of water it takes to cover an acre of land. ETc is crop specific and based on both where the crop is grown (it's CIMIS ETo or evapotranspiration zone<sup>3</sup>) and how it is grown (each estimate includes assumptions about crop density, soil type, irrigation type, etc.). The assumptions made in developing IRTC's ETc values for California crops can be viewed on their website.<sup>4</sup>

The annual ETc values developed by IRTC include evaporation during non-growing periods, which is one reason these values may be higher than other published values or than actual irrigation use.

The first column in the table below lists the crops in our analysis, as listed in the Kern County Agricultural Commissioner's annual Crop Reports. The second column is the closest match for that crop in IRTC's database on ETc values. The third column is the average annual ETc for that crop in CIMIS ETo zones 14 and 15, where much of the agriculture in Kern County takes place.

The map below shows the location of CIMIS ETo zones.

Crop	Source of ETc value in ITRC database	Annual ETc in acre inches, dry year estimate
Crop		Average of Zones 14 & 15
Alfalfa Hay	Alfalfa Hay and Clover	51.1
Almonds	Almonds	44.3
Grapes	Grape vines with 80% canopy	32.3
Silage and Forage	Grain and grain hay	18.5
Wheat	Grain and grain hay	18.5
Pistachios	Pistachio	41.0
Citrus	Citrus, no ground cover	44.1
Grain Hay	Grain and grain hay	18.5
Potatoes	Potatoes, Sugar Beets, Turnips, etc.	38.3
Barley	Grain and grain hay	18.5
Tomatoes, Processing	Tomatoes and peppers	27.9

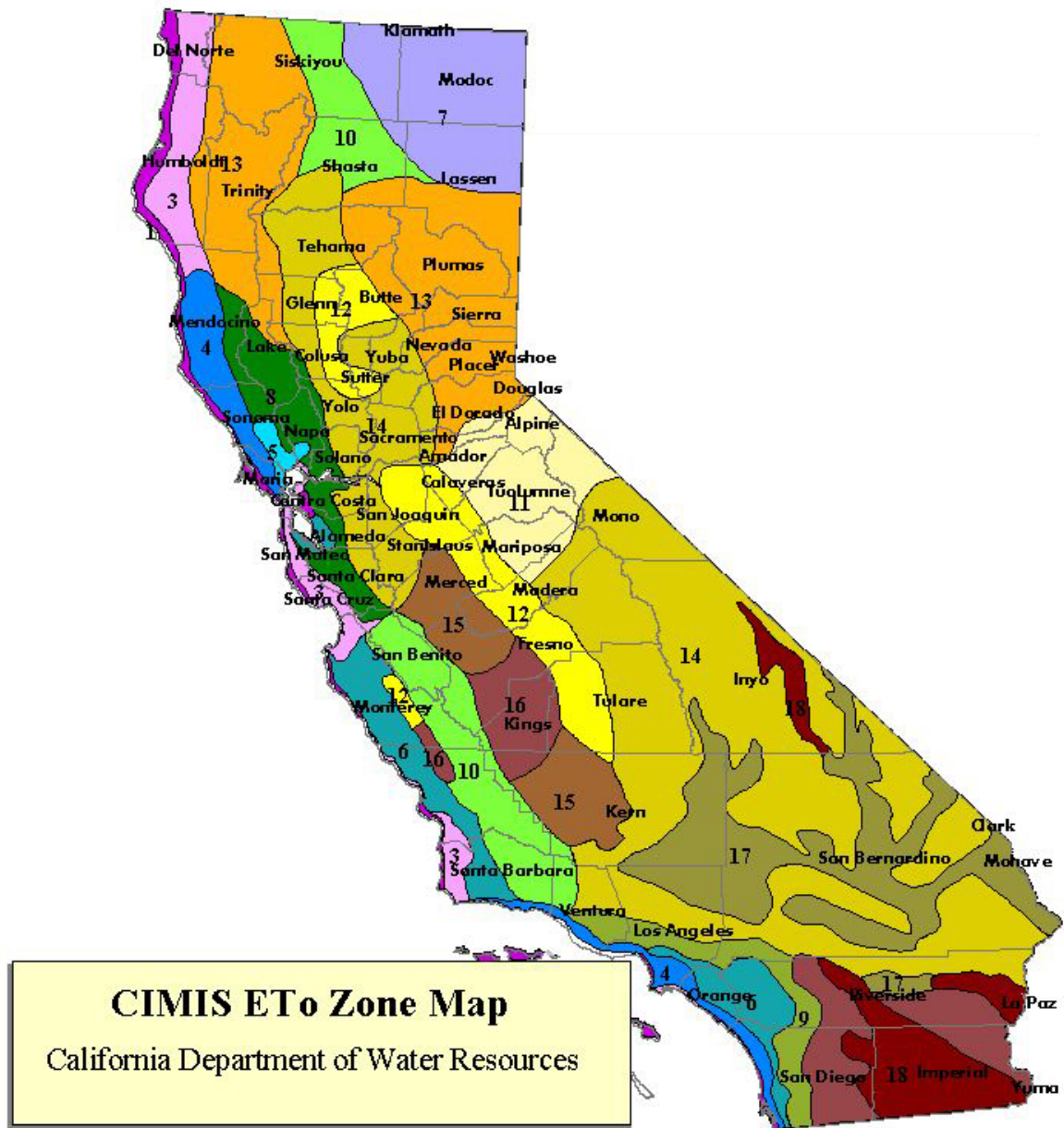
1 Food and Agriculture Organization of the United Nations. (1998). *Crop evapotranspiration – Guidelines for computing crop water requirements* – FAO Irrigation and drainage paper 56. Retrieved April 11, 2017 from <http://www.fao.org/docrep/X0490E/X0490E00.htm>

2 As of April 11, 2017: <http://www.itrc.org/etdata/etmain.htm>

3 California Irrigation Management Information System (CIMIS)'s California evapotranspiration zones

4 As of April 11, 2017: <http://www.itrc.org/etdata/explanation.htm>





## Appendix J:

### Accidents reported to OSHA for Support Activities for Crop Production (NAICS 1151) in Kern County

**Vision 3:** Healthy Farms and Environment

- **Goal 3:** Kern County's food systems workers are part of a safe and fair work environment
  - **Indicator 1:** Agricultural injuries, illnesses, and fatalities in Kern County
    - **Measure 1:** Occupational accidents reported to OSHA – Support activities for crop production (NAICS 1151)

The following table lists the OSHA description and keywords for each reported accident involving support activities for crop production in Kern County between 2002 and 2016. Fatalities are in red.

2002	Event description	Event keywords
21-Jan-02	Employee killed when leg pinned between fork lift and bin	Embolism, lung, storage bin, heart attack, caught between, industrial truck, laceration, leg
11-May-02	Employee injured when run over by tractor	Fracture, crop shredder, clutch, farm machinery, struck by, tractor, run over, gear
9-Jul-02	Employee burns hand on moving conveyor belt	Arm, conveyor, belt, caught between, finger, hand, burn
20-Oct-02	Employee injured when he falls from a ladder	Extension ladder, ladder, slip, back, abrasion, fall, contusion
21-Oct-02	Employee falls from ladder and fractures pelvis	Ladder, fall, fracture, pelvis, agriculture
25-Oct-02	Employees burned when splashed with hot asphalt	Burn, asphalt, roof, ppe, flying object, cleaning
27-Oct-02	Employee finger amputated while cleaning press tamper	Amputated, finger, work rules, caught by, cotton gin, press
2003	Event description	Event keywords
15-Jan-03	Employee cut leg on unpadded emergency brake	Brake, industrial truck, laceration, leg
13-Feb-03	Employee suffers amputation	Battery, amputated, finger, hoist, industrial truck, nip point, guide post
31-Mar-03	Employee suffers multiple fractures after truck overturns	Overturn, truck, fracture, ditch
24-Jun-03	Employee amputates finger in stitching machine	Amputated, finger, guard, work rules, machine operator, caught between, sealing machine
7-Oct-03	Employee falls from trailer	Ankle, trailer, fall, slip, run over, tire, brake
19-Oct-03	Employee sustains fracture when struck by forklift	Fracture, caught between, industrial truck, struck by, foot

2004	Event description	Event keywords
8-Jan-04	Employee is injured while dismounting forklift	Fracture,slip,driver,industrial truck,fall,arm
21-Jan-04	Laborer sprains back in fall through roof	Agriculture,fall,laceration,sprain,roof,roof opening,mouth,back,fall protection,work rules
5-Feb-04	Employee's leg fractured after being struck by forklift	Fracture,industrial truck,struck by,leg
11-Aug-04	Employee hands caught between truck frame and trailer	Trailer,hand,caught between,fracture
31-Aug-04	Employee's arm and hand are injured in a conveyor	Burn,food preparation,agriculture,caught by,laceration,conveyor,manual mat handling,arm,hand
6-Sep-04	Employee's leg broken in vehicle collision	Fracture,harvester,industrial truck,laceration,truck,struck by,motor vehicle,leg
10-Sep-04	Employee suffers amputation when caught in conveyor	Amputated,agriculture,farm machinery,caught by,conveyor,toe
1-Nov-04	Employee killed in tractor rollover	Crushed,roll-over,tractor,farm machinery,ditch
10-Dec-04	Employee fractures leg when struck by bin	Struck by,fracture,leg,ejected,manual mat handling,loading,trailer ,laceration
22-Dec-04	Employee is injured when struck by industrial truck	Farm machinery,pallet,industrial truck,struck by,leg,ankle,dislocated
26-Dec-04	Employee is killed by rotating arm of press machine	Head,rotating parts,cleaning,struck by,cotton,press
2005	Event description	Event keywords
14-Mar-05	Employee is killed when run over by tractor	Tractor,farm machinery,agriculture,run over
20-May-05	Mechanic amputates finger in filling machine chain	Chain,amputated,agriculture,finger,mechanic,lockout,caught between,nip point
20-Jul-05	Employee suffers from heat stroke while working in field	Heat stroke,agriculture,heat
21-Jul-05	Employee suffers from heat exhaustion and later dies	Heat exhaustion,heat stroke,agriculture,heat
25-Jul-05	Employee amputates finger in drive belt	Maintenance,amputated,repair,belt,finger,caught between
13-Oct-05	Employee fractures leg and foot when leaving forklift	Farm machinery,industrial truck,tractor,trailer,footings,foot,fracture,leg

2006	Event description	Event keywords
6-Jan-06	Employee is injured in roof collapse	Roof collapse,fracture,roof,demolition,tibia,trailer,leg
24-Jan-06	Forklift truck operator overturns vehicle and amputates toe	Amputated,roll-over,speeding,work rules,equipment operator,overhead guard,industrial truck,mech mat handling,toe,lost control
8-Apr-06	Employee is injured in forklift accident	Warehouse,machine operator,struck against,industrial truck,laceration,storage rack
10-Apr-06	Employee is injured using shotgun	Gunshot,amputated,hand,finger
17-May-06	Employee falls through roof and fractures wrists	Fracture,roof,collapse,agriculture,struck against,fall,work surface,wrist
10-Jul-06	Mechanic sustains fracture to arm when caught in conveyor	Mechanic,repair,maintenance,food preparation,lockout,conveyor belt,fracture,roller conveyor,unguarded,work rules
2-Dec-06	Employee's ankles are fractured when cotton gin starts up	Fracture,maintenance,agriculture,work rules,cleaning,machine operator,lockout,caught between,cotton gin,point of operation
28-Dec-06	Employee's finger is amputated by sprayer motor	Amputated,belt,finger,lockout,caught between,pulley
2007	Event description	Event keywords
16-Apr-07	Two employees burned by flaming gasoline	Burn,maintenance,agriculture,fire,explosion,truck,face,gasoline,h and,gas can
15-Sep-07	Employee's arm fractured when caught in machine	Caught by,jammed,conveyor,arm
2-Oct-07	Employee's shoulder is fractured by boom from spray rig	Agriculture,struck by,falling object,fracture,boom,spraying rig,slip,shoulder
30-Oct-07	Employees suffer severe burns in explosion	Burn,fire,explosion,smoke,tractor,cotton,smoke inhalation
2008	Event description	Event keyword
5-Feb-08	Employee's finger is amputated by chain and sprocket	Chain,amputated,finger,lockout,sprocket,hand tool,unguarded
6-May-08	Employee burned by rotating shaft	Burn,rotating parts,repair,welding,lockout,conveyor

10-May-08	Farm worker sustains fractured leg in fall from trailer	Agriculture,farm machinery,tractor,trailer,inattention,lost balance,fall,caught by,tire,fracture
16-May-08	Employee is injured while rigging tank	Tank,loading,unstable load,trailer,crane,tag line,rigging,suspended load
15-Jun-08	Employee receives second and third degree burns	Burn,fire,smoke,flammable liquid
30-Jun-08	Employee is killed when caught between truck and tractor	Caught between,run over,tractor,asphyxiated,chest
3-Jul-08	Employee amputates finger in conveyor belt	Amputated,belt,machine operator,conveyor belt,hand,finger,belt conveyor,machinist
9-Jul-08	Employee sustains heat illness when exposed to heat	Agriculture,heat exhaustion,heat
10-Jul-08	Employee sustains heat exhaustion due to exposure to heat	Heat exhaustion,agriculture,high temperature,cardiovasc system
10-Jul-08	Employee dies from heat stroke	Heat stroke,heat exhaustion,agriculture,high temperature
11-Jul-08	Employee experiences possible heat illness	Agriculture,high temperature,heat exhaustion,heat stroke
18-Jul-08	Employee trips and fractures arm in fall	Tripped,fall,fracture,arm,inattention,caught by
20-Jul-08	Four employees are exposed to carbon monoxide	Agriculture,inhalation,carbon monoxide,poisoning
27-Aug-08	Employee hand is crushed in dumping machine	Dumper,crushed,hand,contusion,caught by,machine operator
17-Sep-08	Employee is killed when crushed by forklift mast	Chest,ind trk operator,agriculture,caught between,crushed,industrial truck,mech mat handling
18-Sep-08	Employee's fingers are amputated in cutting machine	Amputated,finger,rotating knife,lockout,struck by,nip point
30-Oct-08	Employee drowns, not work related	Drown
30-Dec-08	Worker amputates finger while cutting roses with saw	Machine operator,saw,blade,caught by,rotating knife,glove,hand,s evered,amputated,finger

2009	Event description	Event keywords
27-Feb-09	Employee is injured when struck by relief disk	Pressure piping, valve, laceration, struck by, face, water, flying object
16-Mar-09	Employee falls from atv	Fall, vehicle, lost control, overturn
24-Mar-09	Employee's fingertip is amputated by chain and sprocket	Chain, amputated, finger, glove, food packaging mach, conveyor, sprocket, nip point
29-Apr-09	Employee's finger is struck by object	Finger, struck by
9-May-09	Employee falls while typing trees	Agriculture, fall
23-Jun-09	Employee amputates hand in rotating fan blades	Maintenance, amputated, fan blade, mechanic, struck by, spraying rig, hand, lubricating
15-Jul-09	Worker dies from myocardial infarction	Heart, heart attack, heat, agriculture
11-Aug-09	Employee's finger is pinched by pipe, later amputated	Agriculture, caught between, amputated, finger, irrigation pipe, pipe, inattention
3-Oct-09	Agricultural worker sustains lacerations in twin augers	Agriculture, farm machinery, control lever, lost balance, fall, caught by, auger, laceration, neck, chest
7-Oct-09	Metal rod impales farm worker	Agriculture, head, metal bar, impaled
5-Nov-09	Employee receives electrical shock from powerline	Tree pruner, overhead power line, electric shock, shock, work surface, neck
2010	Event description	Event keywords
24-May-10	Employee injured in agricultural accident	Fracture, fall, struck by, tractor, arm
29-May-10	Employee injures hand in shot gun shell accident	Wrench, amputated, finger, truck, pipe
5-Jun-10	Employee fractures neck in atv accident	Fracture, neck, vehicle, tree, head
8-Jun-10	Employee's hand caught in straw blanket machine	Laceration, fracture, hand, finger, forearm, arm, baler
22-Jul-10	Employee suffers heat exhaustion	Heat, heat stroke, fall
25-Sep-10	Employee dies in bankout accident	Head, crushed, struck by
3-Oct-10	Employee's leg is lacerated by almond harvester	Agriculture, run over, laceration, leg, degloved, farm machinery

27-Dec-10	Farm worker sustains brain injury in fall from trailer	Agriculture,farm machinery,trailer,riding on equipment,uneven ground,lost balance,fall,struck against,head,brain
<b>2011</b>	<b>Event description</b>	<b>Event keywords</b>
17-Jan-11	Employee is injured when arm is caught in conveyor	Wrench,maintenance,amputated,belt,mechanic,caught by,thumb,conveyor,extension handle,hand tool
7-Feb-11	Employee's leg is fractured when run over by trailer	Run over,leg,tibia,agriculture,trailer,tire,tree,fracture
18-Feb-11	Employee sustains multiple fractures when run over by trailer	Agriculture,trailer,run over,struck by,motor vehicle,fracture,obstructed view
29-Mar-11	Employee amputates thumb in conveyor	Chain,maintenance,amputated,cleaning,thumb,caught between,conveyor,sprocket,nip point
22-Apr-11	Employee suffers serious injury from chain saw	Laceration,chain saw,saw,struck by,tree
10-May-11	Employee fractures leg in fall from ladder	Fracture,leg,fall,ladder,harvester,agriculture,lost balance,load shift
25-May-11	Employee is injured when trailer falls on him	Caught between,falling object,trailer,back,fracture,agriculture
29-May-11	Employee fingers are amputated in conveyor belt	Maintenance,amputated,finger,machine operator,lockout,caught between,nip point,pulley,conveyor belt
7-Jun-11	Employee is killed in fall from ladder at peach orchard	Agriculture,fall,fracture,rib,ladder,tree
11-Jun-11	Employee is injured in fall from tree limb	Tree,tree limb,ladder,tree trimming,agriculture,fall,laceration,head ,struck against,leg
14-Jun-11	Employee's thumb is crushed in silo auger	Crushed,hand,silo,fracture,thumb,auger,irrigation equipment,lockout,rotating parts
6-Jul-11	Farm worker sustains heat-related illness	Heat,agriculture,driver,heat stroke,heat exhaustion,spraying rig,pesticide
6-Jul-11	Employee suffers possible heat illness while picking peppers	Heat exhaustion,agriculture,harvester
16-Jul-11	Employee losses consciousness in fertilizer tank	Agriculture,asphyxiated,confined space,tank,tank cleaning,oxygen deficiency,unconsciousness

3-Aug-11	Employee sustains heat-related illness	Agriculture,heat,heat exhaustion,heat stroke
30-Aug-11	Employee faints from heat exhaustion	Agriculture,heat,heat exhaustion,heat stroke,fainted
15-Sep-11	Employee falls from ladder and is injured	Ladder,lost balance,fall,back,neck
22-Sep-11	Employee gets struck on the knee by forklift tine	Knee,industrial truck,struck against,laceration,reflective vest
12-Oct-11	Two employees are overcome by fumes; one dies	Drain pipe,clogged,asphyxiated,hydrogen sulfide,chemical vapor,toxic fumes,overexposure,lung,inhalation,agriculture
18-Nov-11	Employee is injured when pinned by trailer	Tractor,trailer,agriculture,struck by,pinned,backing up,inattention,communication,fracture,abdomen
9-Dec-11	Employee is injured when struck by falling equipment	Head,abdomen,agriculture,loading,struck by,abrasion,contusion,falling object,trailer truck,unstable load
30-Dec-11	Employee is killed when run over by loader truck	Farm machinery,loader,loader bucket,truck,wheel,run over
<b>2012</b>	<b>Event description</b>	<b>Event keywords</b>
16-Jan-12	Employee injured using a pruner	Laceration,thumb,amputated
3-Apr-12	Farm laborer sustains laceration in fall from ladder	Agriculture,ladder,tree,tree limb,fall,impaled,laceration,arm
25-Apr-12	Worker fractures ankle in fall from all-terrain vehicle	Fracture,agriculture,motorcycle,fall,fruit packing,lost balance,lost control,motor vehicle,ankle
7-Jun-12	Employee is hospitalized with hyperventilation syndrome	Headache,vomit,dizziness
13-Jun-12	Employee falls breaking ankle, loses consciousness	Migrant farm worker,fall,fracture,ankle,slippery surface,unconsciousness
21-Jun-12	Employee partially amputates right middle finger in conveyor	Farm machinery,amputated,finger,conveyor,glove
20-Jul-12	Farm worker experiences seizure	Agriculture,epilepsy,heat exhaustion
27-Jul-12	Tractor operator is burned when hydraulic fluid catches fire	Burn,leak,inadequate maint,agriculture,equipment operator,fire,hydraulic fluid,earthmoving equip,equipment failure,hydraulic line



18-Sep-12	Employee loses finger in harvester accident	Amputated,finger,tractor,chain,harvester,tree,health care facility
24-Oct-12	Two refrigeration technicians sustain corneal burns	Eye,leak,maintenance,anhydrous ammonia,corrosive,chemical burn,refrigerator,face,pressure release
25-Nov-12	Powered industrial lift truck hits and injures worker	Struck by,pit,laceration,fracture,pelvis,agriculture,fruit packing
<b>2013</b>	<b>Event description</b>	<b>Event keywords</b>
15-Jan-13	Employee gets arm crushed while operating a forklift	Shock,crushed,industrial truck,arm
12-Apr-13	Employee sustains serious injuries from truck accident	Knee,fracture,amputated,tibia,health care facility,crushed,truck,fall,struck by,leg
22-Jul-13	Employee suffers from heat exhaustion	Heat exhaustion,migrant farm worker
22-Jul-13	Employee fractures finger on machine clamp, later amputated	Migrant farm worker,farm machinery,amputated,finger,fracture,laceration,untrained,machine--misc
24-Jul-13	Employee fractures leg when struck by pipe	Fracture,irrigation pipe,pipe,irrigation equipment,falling object,leg
1-Aug-13	Worker suffers heat illness while removing almonds from tree	Agriculture,fatigue,heat,heat exhaustion,heat stroke,dizziness,migrant farm worker
12-Aug-13	Employee is injured when run over by machinery	Run over,agriculture,asphyxiated,contusion,knee,lung,nose,laceration
8-Sep-13	Employee fractures leg in farming vehicle accident	Fracture,leg,tibia,spraying rig,traffic accident,poor visibility,tractor,farm machinery
26-Sep-13	Employee suffers seizure, not work related	Migrant farm worker,unconsciousness
12-Nov-13	Employee amputates thumb and finger on cutting machine	Maintenance,amputated,repair,finger,farm machinery,mechanic,thumb,nip point,automatic restart,machine-misc
<b>2014</b>	<b>Event description</b>	<b>Event keywords</b>
14-Jan-14	Employee's foot is struck by falling tree and is fractured	Fracture,harvester,tree,struck by,falling object,foot,unstable position
12-Feb-14	Worker is caught by power take-off and sustains fracture	Fracture,belt,agriculture,finger,guard,farm machinery,caught by,lockout,pulley,power take-off

20-Feb-14	Employee receives multiple burns from electricity	Burn,overhead power line,industrial truck,electric shock,struck by,elevated work plat
<b>2015</b>	<b>Event description</b>	<b>Event keywords</b>
9-Feb-14	An employee dies of a heart attack while working in an orange	Agriculture,heart attack,heart
<b>2016</b>	<b>Event description</b>	<b>Event keywords</b>
26-Jul-16	Employee harvesting grapes dies from heart attack	Heart attack,heat exhaustion
8-Nov-16	Employee suffers heart attack at vineyard prior to harvesting	Heart attack