

**Environmental Investigation of *Escherichia coli* O157:H7 Outbreak
Associated with Taco Bell restaurants in Northeastern States**

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Executive Summary

On December 13, 2006 the Office of Emergency Operations of the U.S. Food and Drug Administration (FDA) alerted both the San Francisco District Office and the Emergency Response Unit of the California Department of Public Health Food and Drug Branch (FDB) of an emerging outbreak of *Escherichia coli* O157:H7 illness associated with eating at Taco Bell restaurants and the identification of iceberg lettuce as the most likely food vehicle. The California Food Emergency Response Team (CalFERT), consisting of members from both agencies, initiated the investigation of growers, harvesters, and coolers of the implicated lettuce. Other investigations, including an environmental investigation at the lettuce processor in New Jersey, were conducted by FDA districts in other parts of the country. The scope of this report is confined to the potential source fields of the contaminated lettuce as identified by FDA.

FDA conducted traceback investigations from four Taco Bell restaurants in Pennsylvania, New York, and New Jersey. These restaurants were selected as representative of the Taco Bell restaurants implicated by public health officials. All four restaurants received shipments of commingled shredded lettuce that originated from both Tanimura & Antle, Inc. (T&A) and Garcia and Church Farms (G&C, shipping as Church Brothers, LLC) in Huron, CA. At the time of the initial farm investigation, 13 T&A fields were identified by FDA as possible sources of lettuce served at implicated restaurants during the time period between October 12, 2006 and December 4, 2006. Subsequently, FDA identified one field (of the original 13) owned by T&A and three fields farmed by G&C as most likely to have supplied suspect lettuce during the time period of exposure at the four restaurants in the traceback (between November 15, 2006 and December 2, 2006). CalFERT investigators reviewed documents supplied by Taco Bell Corporation, Ready Pac Produce, Inc. (a processor), and the implicated growers and determined that two additional fields (from the original 13 T&A fields) supplied lettuce during this time period to the four restaurants. Farm investigations involved 16 fields, with a focus on the six fields identified as most likely to have supplied the implicated lettuce.

Farm investigations were conducted by CalFERT in December 2006 and January 2007 at the identified T&A and G&C fields. No readily identifiable risk factors were observed. At the time of the investigation, the fields had been plowed. Some had been planted with a cover crop, and others were fallow. A few residual lettuce plants were found and sampled. Thirty-four samples of soil, vegetation, and water taken in and near suspect fields were tested by FDA laboratories in Alameda and Irvine, and found negative for *E. coli* O157:H7.

Background Information

An outbreak of *E. coli* O157:H7 illnesses, with onsets occurring between November 20, 2006 and December 6, 2006, was associated with eating at Taco Bell restaurants. A total of 77 (69 confirmed and 8 probable) cases in five states—Delaware(2); New Jersey(36); New York(22); Pennsylvania(16); South Carolina(1) (this case ate at a

Taco Bell in Pennsylvania)—were reported to the CDC.¹ Among these 77 ill persons, 55 (71%) were hospitalized and 7 (9%) developed hemolytic uremic syndrome (HUS). A confirmed case was defined as a culture-confirmed *E. coli* O157:H7 infection in a U.S. resident with illness onset between November 15 and December 14, 2006, with a PFGE pattern matching the outbreak strain, and a history of eating at Taco Bell within 14 days before illness onset. Probable cases were defined by the following criteria: diarrheal illness in a U.S. resident with illness onset between November 15 and December 14, 2006, and either non-culture evidence of *E. coli* O157 (such as Shiga toxin detection or HUS diagnosis) or the culture-confirmed presence of *E. coli* O157:H7 with no PFGE done, and the person had a history of eating from a Taco Bell restaurant within 7 days before illness onset in a state where a confirmed case had also eaten at Taco Bell. Initially, a case control study identified lettuce, cheese, and ground beef as possible vehicles, as announced by CDC on December 7, 2006. On December 14, 2006, the CDC issued an updated press release stating that lettuce was considered the most likely vehicle. CalFERT initiated the environmental investigation with a call on December 13, 2006, to the Tanimura and Antle Vice President for Supply Chain Management, Mr. Eric Wexler, informing him of the outbreak, that his firm had been identified as a supplier of implicated iceberg lettuce, and that CalFERT members would visit his facility to collect distribution records.

Traceback Investigation

Based on epidemiological findings by the CDC implicating shredded iceberg lettuce as the most likely vehicle for the outbreak pathogen, the FDA conducted a document review of iceberg lettuce shipments for four of the Taco Bell restaurants linked to ill individuals (Gilbertsville, PA; South Plainfield, NJ; Massena, NY; and Riverhead, NY). The scope of these shipments was further refined by using the exposure dates of 20 case-patients who ate at these four restaurants, ranging from November 15, 2006 to December 2, 2006, (this date range includes almost all of the 71 cases that were reported at that time). The traceback of these shipments began with information provided by the Taco Bell Corporation (Exhibit 1). These documents showed that the selected Taco Bell stores were supplied with shredded lettuce from only one processor, Ready Pac Produce, Inc. (Florence, NJ) via McLane Distribution Centers in Burlington, NJ (for the Pennsylvania, New Jersey, and Long Island stores) and Albany, NY (for the Massena, NY store). These same documents also identified specific growing fields of Church Brothers Farms (G&C) in Huron, CA, and Yuma, AZ; Bonita Packing (Huron, CA); as well as the growing fields of Tanimura and Antle Inc. (T&A) located in Salinas, CA; Huron, CA; and Yuma, AZ.

Although Bonita Packing was initially implicated, this grower was subsequently discounted as a probable source because Bonita appeared in only three of the four legs of the traceback and because of the relatively small amounts of lettuce shipped compared to the other two firms. Similarly, the Yuma, AZ, facilities were discounted by

¹ Iwamoto, Martha. Multistate outbreaks of *Escherichia coli* O157 infections from lettuce consumed at national fast food chains, November-December 2006. Presented at the International Association for Food Protection, Orlando, FL, on July 9, 2007

virtue of their shipments being largely outside the suspect harvesting time frame of October 27, 2006, to November 27, 2006. Purchase Order numbers (POs) and actual field identifiers were cross-referenced with harvesting records (Exhibits 2, 3), shipping records (Exhibit 4), Bills of Lading (Exhibit 5), and other documents provided by Ready Pac, T&A, and G&C. An overview of product movement is shown below (Figure 1) and in Attachment 2.

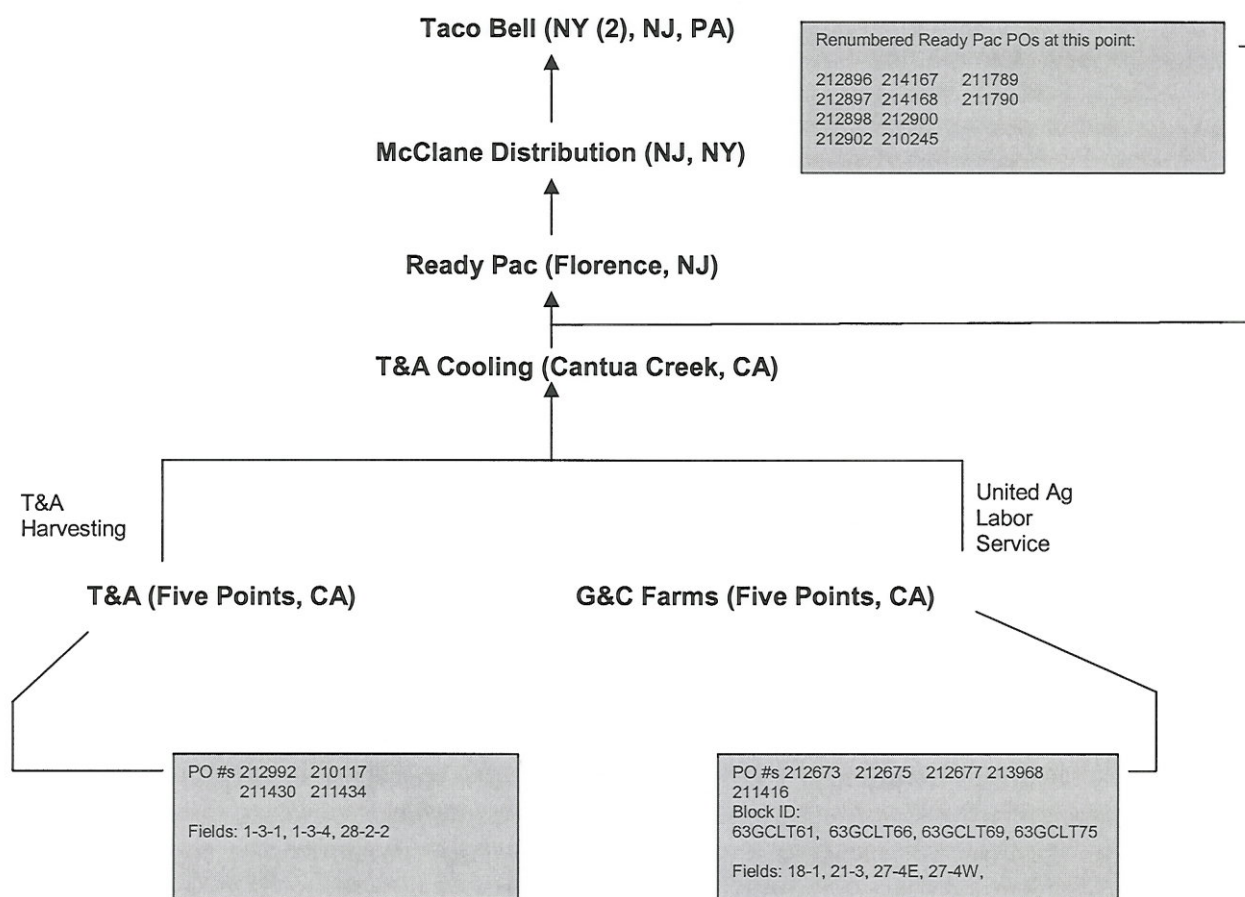


Figure 1. Product Flow of implicated shipments

On January 8, 2007, CalFERT was informed by the FDA that three fields identified as 18-1, 27-4E, 27-4W at G&C and one field identified as 28-2 at T&A were the common sources of iceberg lettuce for the four restaurants during the time period of interest. Reviewing information (Exhibits 1, 4) supplied by Taco Bell Corporation and Ready Pac, CalFERT investigators found that one additional T&A Field (Field 1-3 Lots 1 and 4) also supplied iceberg lettuce to the four restaurants. Lettuce from T&A Field 28-2 Lot 4 was delivered to one of the four restaurants on November 2, 2006, with a "Best if Used By" date November 9, 2006, which is earlier than the window of exposure dates under consideration. The other three restaurants received lettuce from Field 28-2 Lot 2, which was delivered shortly before the window of exposure dates. This information is

summarized in Table 1. Examination of the data shows that the lettuce supplied from G&C blocks 63GCLT61, 63GCLT67, and 63GCLT 69 was supplied to all four restaurants on November 21, 2006 with a "use by" date of December 1, 2006. Other lettuce supplied to all four restaurants (such as 63GCLT75 from Field 21-3) was delivered later in the exposure period, and past the peak of the epidemiologic curve. This field (21-3) was not included in the field investigations. Data inaccuracies and discrepancies were noted in Exhibit 1.

Table 1. Summary of Taco Bell traceback information derived from Exhibits 1 through 6*. See also Attachment 2. Exposure dates for case patients at these restaurants were between November 15, 2006, and December 2, 2006. Exposure dates and locations for individual cases were not available to CalFERT. The fields that supplied all four restaurants are highlighted.

Field/lot and Block ID (for G&C)	Taco Bell restaurant**	Harvest dates (from grower records)	Ready Pac processing dates (from Exhibit 1)	Delivery to Taco Bell restaurants (Exhibit 1)	Use By Dates (from Exhibit 1)
28-2-4 (T&A)	NY-M	10/23/06-10/25/06	10/28/06	11/2/06	11/9/06
28-2-2 (T&A)	PA, NJ, NY-R	10/31/06-11/3/06	11/6/08,11/8/06	11/8/06-11/11/06	11/18/06,11/20/06
1-3-4 (T&A)	PA, NY-R, M	11/3/06-11/7/06	11/11/06	11/13/06-11/16/06	11/23/06,11/24/06
1-3-1 (T&A)	PA, NJ, NY-R, M	11/14/06-11/18/06	11/22/06, 11/24/06	11/25/06-11/27/06	12/5/06, 12/6/06
63GCLT61 (G&C ranch 18-1)	Not available (commingled with 63GCLT67)	Week of 11/6/06	Block ID does not appear in Exhibit 1	Not available	Not available
63GCLT66 (G&C ranch 27-4E)	Not available (commingled with 63GCLT61)	Week of 11/6/06	Block ID does not appear in Exhibit 1	Not available	Not available
63GCLT67 (G&C ranch 18-1)	PA, NJ, NY-R, M	Week of 11/6/06	11/18/06	11/21/06	12/1/06
63GCLT69 (G&C ranch 27-4W)	PA, NJ, NY-R, M	Week of 11/13/06	11/18/06	11/21/06	12/1/06
63GCLT75 (G&C ranch 21-3)	PA, NJ, NY-R, M	Week of 11/20/06	11/24/06, 11/25/06	11/28/06, 11/30/06	12/8/06

*Data provided by Taco Bell Corporation, Ready Pac, and growers were in some cases incomplete and contained typographical errors that were misleading. This table is our best attempt to reconstruct the flow of the product from the fields to the point of service.

**Restaurant codes: NY-M refers to Massena, NY; NY-R refers to Riverhead, NY. The PA store was in Gilbertsville, PA; the NJ store was in S. Plainfield, NJ.

With information provided by Ready Pac, the FDA attempted to reconcile the different types of records, resolve typographical errors, and understand Ready Pac's PO numbering system which uses multiple shipment identifiers for the same shipments (Attachment 2). For instance, Ready Pac would issue Vendor POs to the growers for each lot harvested that day. After harvest, individual shipments from the different growers were commingled and this new mixed shipment was subsequently renumbered using another set of PO #s after leaving the cooler (Attachment 2). All implicated shipments that were received by Ready Pac from G&C and T&A were cooled in vacuum tubes with no water present at T&A's cooling facility in Cantua Creek, CA and were tagged with these multiple identifiers.

Environmental Investigations

Farm Investigation: Tanimura & Antle, Inc. (T&A)

Headquarters: 1 Harris Road, Salinas, California 93908

Tres Picos Ranch (San Joaquin Valley lettuce operations): 28947 W. Mt. Whitney, Five Points, California 93624

Contacts: Mr. Eric Wexler, Vice-President Supply Chain

Mr. Robert S. Mills, Director of Food Safety/Quality Assurance

Mr. Jad Crusha, Food Safety Coordinator

Mr. Chris Thomas, Business Manager for Industrial Sales

On December 14, 2006, CalFERT investigators collected documents at the T&A facility in Salinas. These documents included bills of lading for lettuce shipped by T&A to Ready Pac in Florence, NJ, and a spreadsheet showing work orders for each PO number, which could be traced to the fields (Exhibits 4, 5, 6). Thirteen fields were initially implicated as providing lettuce to Ready Pac between October 12, 2006, and December 4, 2006 (Exhibit 7).²

On December 16, 2006, CalFERT investigators interviewed Mr. Robert S. Mills, Director of Food Safety/Quality Assurance, Mr. Marty Moore, General Manager San Joaquin Farm Operations, and Mr. George Garcia, Pest Control Advisor, Tanimura & Antle, Inc., Five Points. The T&A properties in the Huron-Five Points area are referred to by the firm as Tres Picos. Tres Picos is made up of ten growing operations organized as LLC's, all of which have the same general manager. The three T&A employees escorted the CalFERT investigators to the thirteen fields of interest identified above. The fields are located east of Interstate 5, between West Harlan Avenue and West Paige Avenue (Exhibit 7). The northwest section is bordered by Cantua Creek. The firm grows lettuce at Tres Picos during the spring and fall seasons. The varieties of lettuce planted in the Fall of 2006, along with planting and harvest dates are shown in Exhibit 2. In the summer of 2006, four of the thirteen fields had snap bean crops, while the others were bare. Other crops on adjoining fields in the fall season of 2006 included: iceberg lettuce (fresh and process), romaine, parsley, and garlic (Exhibit 8).

² The field numbering system consists of three numbers. The first number is the section. Each section is one square mile. The sections are divided into four quarters, designated by the second number. The quarter is divided into six fields or lots. This is the third number.

On January 8, 2007, CalFERT received information from the FDA that T&A Field 28-2-2 was the only one of the originally identified 13 fields that had been linked through POs to the implicated restaurants for the time period of November 15 to December 2, 2006. This field is owned by Poseidon Farms, LLC. According to documents provided by T & A, Field 28-2-2 contained spring mix lettuce and its surrounding fields had spring mix lettuce and romaine lettuce during the spring 2006 season (Exhibit 8). Field 28-2-2 contained snap beans during the summer 2006 season. At the time of the investigation, one adjacent field contained lettuce grown for seeds, while the rest were empty. For the Fall 2006 season, Field 28-2-2 contained 26.8 acres of lettuce grown from seed variety [REDACTED] purchased from Central Valley Seeds Inc. (1881 S. Leonard Ave., Sanger, CA 93657). The field was harvested from October 31, 2006 to November 3, 2006 (Exhibit 2). Lettuce from Field 28-2-2 that was supplied to Taco Bell restaurants was processed by Ready Pac on November 6 and 8, 2006, and received by three of the four restaurants in the traceback between November 8 and November 11, 2006, according to documents provided by Taco Bell Corporation (Exhibit 1). By cross-referencing information from Exhibits 1, 2, and 5, CalFERT investigators identified Fields 1-3-1 and 1-3-4 as having supplied lettuce that went to the restaurants in the traceback. Field 1-3-4 yielded lettuce harvested from November 3 to November 7, 2006, processed by Ready Pac on November 11, 2006, and distributed to three of the four restaurants. Field 1-3-1 was harvested beginning November 14 and ending November 18, 2006, processed on November 22 and November 24, 2006, and delivered to all four restaurants in the traceback. For details, please see Table 1 and Exhibit 1. Field 1-3-1 was planted with 16 acres of seed variety [REDACTED] supplied by 3 Star Lettuce (39 Gonzales River Rd., Gonzales, CA 93926) and 9.5 acres with [REDACTED] seed supplied by Progeny Advanced Genetics (1536B Moffet St., Salinas, CA 93905). Field 1-3-4 was planted with 12 acres of seed variety [REDACTED] and 13.3 acres of seed variety [REDACTED] supplied by Gowan Seed Company (25445 Chualar River Rd., Chualar, CA). Field 1-3 is in the southeast area of Tres Picos. In the spring 2006 season, spring lettuce was grown on both lots. Snap beans were grown on Field 1-3-1 during the summer of 2006, and 1-3-4 was fallow.

No flooding was reported in the fields in 2006. The blocks are sloped for drainage, and underground drainage carries water away from the fields. During October and the first half of November 2006, when the lettuce was above ground, total rainfall was 0.40 inch³. Most of that amount (0.36 inch) fell on October 5, 2006, when the plants were small. Monthly rainfall during the first six months of 2006 varied from 4.03 inches in January to 0.00 inch in June.

All lettuce fields at Tres Picos are watered by overhead sprinklers at planting, according to the General Manager and documented by the Water and Fertilizer Schedule (Exhibit 12). After germination, water is applied by drip irrigation. All irrigation water is supplied by the California Aqueduct through the Westland Water District. No recycled water is used for irrigation. Water samples from the California Aqueduct were taken periodically by T&A and sent to Primus Labs in Santa Maria for *E. coli* O157:H7 testing. T&A

³ Data from Five Points station, California Irrigation Management Information System, Department of Water Resources

provided October 2, 2006 water testing results (Exhibit 9), which showed that the water sample that had been analyzed by the FDA Bacteriological Analytical Manual (BAM) method was negative for *E. coli* O157:H7. According to Mr. Jad Crusha, Food Safety Coordinator for T &A, water samples were not collected on a regular schedule in 2006, and the October 2nd sample was the only sample collected during the growing period for the implicated lettuce. The Westland Water District also does periodic testing of the California Aqueduct water. Four samples (location of samples shown in Attachment 3) taken by a Westlands Water District employee (using laboratory-supplied procedures and supplies) on October 12, 2006, were analyzed for *E. coli* O157:H7 by BSK Food and Dairy Laboratories, and were also negative (Exhibit 10). Spray applications are done with tractor-pulled spray rigs. T&A has standard operating procedures (SOPs) for cleaning the spray rigs (Exhibit 11). Spray tanks are cleaned by brushing the inside and outside of the tank with a minimum of 100 gallons of water and the spray nozzles are cleaned with a wire brush. Water for spray applications is from the aqueduct. CalFERT was provided with documentation of the fertilizers and pesticides applied to these fields (Exhibit 12; Exhibit 13 ; Exhibit 14).

The firm last applied composted cattle manure in the time frame of October to November, 2005. The cattle manure was received from Harris Feeding Company (29475 Fresno-Coalinga Road, Coalinga, CA 93210). Harris Feeding Company spread the manure, and did not store it on T&A ranches. Test results (Exhibit 14) from Soil Control Lab (Watsonville, CA) on composted manure sampled from Harris Ranch Feeding Company on October 6, 2006 showed <2 MPN/gram dry weight fecal coliform; <3 MPN/4 grams dry weight *Salmonella*, and <2 MPN/gram dry weight *E. coli*. These lab results were supplied by T&A to CalFERT during our visit on December 16, 2006. It was noted that these results were from a recently purchased composted lot and not the compost applied to the suspect fields in 2005.

There are no feed lots or dairy farms within one mile of the thirteen fields. Harris Ranch feed lots are located approximately five miles away. There is a fence to deter rabbit entry along the Cantua Creek, but many of the other areas are unfenced. Management stated that there are birds and occasional coyotes observed in the area. There were animal tracks observed along a ditch next to the east side of Field 28-2-2 and numerous tracks in Cantua Creek adjacent to the north side of Sections 27 and 28 (see Exhibit 7 for map). These tracks were not identified.

According to Mr. Mills, T&A provides health insurance and sick leave to seasonal and permanent workers. Mr. Mills stated that there were no reports of enteric disease in farm workers or their families during the suspect harvest period. Health, hygiene, and sanitation training is provided to the employees in English and Spanish. There is always a foreperson or supervisor present to monitor worker health, hygiene, and sanitation practices, according to the firm. At least two portable toilets are provided per 24 person work crew. The portable toilets are supplied with water, soap, and paper towels. Dirty hand wash water is collected in a tank and does not drain to the ground. Portable toilets are serviced at the harvest equipment yard daily by Star Sanitation Services (1 Harris Rd. Suite A Salinas, CA). A spreadsheet showing frequency of servicing is shown in Exhibit 15.

A third party Good Agricultural Practices (GAP) Food Safety audit of T&A Tres Picos Ranch (T&A lettuce-growing operation in San Joaquin Valley) by Scientific Certification Systems of Emeryville on October 26, 2006 yielded an audit score of 99.10% (Exhibit 16). T&A also previously performed an internal GAP audit of farming operations on October 16, 2006 (Exhibit 17). No adverse findings were noted.

Further information from traceback documents received after this field investigation identified Fields 28-2-2, 1-3-1, and 1-3-4 as the fields of greatest interest (see Traceback Section and Exhibit 7). Field 28-2-2 is located on the east side of Section 28, surrounded by other fields on three sides with a service road and ditch on the east side. GPS coordinates are shown in Attachment 4. The first watering date for this particular crop was August 25, 2006 (Exhibit 12, Water and fertilizer schedule). Sprinkler irrigation was used during the initial planting period through September 9, 2006, and drip irrigation used thereafter until harvest. The pesticide use report for this field shows three applications (September 6, September 28, and October 18, 2006) of seven different insecticides by ground spray (Exhibit 13). Fertilizer applications were water-soluble and applied through the irrigation system. Test results were available for one of the fertilizers used on this field (██████), negative for *E. coli* and *Salmonella* in sample collected on October 10, 2006) (Exhibit 14). Field 1-3-1 was planted September 3, 2006, and sprinkler irrigated through September 19, 2006 (Exhibit 12) followed by drip irrigation until harvest. Field 1-3-4 was planted August 26, 2006, and sprinkler irrigated through September 12, 2006. Fertilizer applications are shown in Exhibit 12. The pesticide use report (Exhibit 13) shows multiple applications to Field 1-3-4 both by air and ground, and multiple ground applications to Field 1-3-1.

CalFERT Environmental Sampling: Tanimura & Antle, Inc.

On December 20, 2006, twenty-six environmental samples from T&A fields were collected by investigators (Attachment 4, Sample Summary). Two samples were collected selectively from areas likely to contain bacterial pathogens from each of the thirteen fields. Samples consisted of lettuce, soil, and sediment. No *E. coli* O157:H7 was detected in any of the samples.

Harvester Investigation: Tanimura & Antle, Inc.

T&A has its own harvesting crew and harvesting equipment. Throughout the season, both the crew and equipment travel throughout California and Arizona to harvest their fields. During the initial phase of the investigation, the harvesting crew was not in the Huron region and therefore could not be observed. CalFERT investigators subsequently interviewed Mr. Robert Mills (Director of Food Safety/Quality Assurance), Mr. Jad Crusha (Food Safety Coordinator), and Mr. Brian Ziemann (Harvest Manager) on May 8, 2007 during a site visit to a T&A harvest of whole head wrapped lettuce. This harvest was observed as an example of T&A harvest practices. The location of the harvest was not related to the fields under investigation.

T&A employs permanent harvest workers who are trained in the GAPs, sanitation, and Standard Operating Procedures (SOPs). Training is provided in Spanish and English. Workers sign a document stating that they have read the procedures (Exhibit 18).

Mr. Ziemann, Harvest Manager, stated that the water used to fill the tank on the harvest equipment is from the harvest equipment yard. This water is filtered and chlorinated Aqueduct water. The water treatment equipment is monitored by Westside Water Conditioning (45 West G Street, Los Banos, CA 93635). Invoices for that time period from Westside Water Conditioning were provided (Exhibit 19). The invoices show "chlorine residual after filter" between 0.3 and 1.3 ppm. No additional chlorine is added to the water on the harvest equipment used to spray the lettuce, according to the Food Safety Coordinator.

Harvest equipment is owned by T&A and is not shared with other harvesters. The equipment is cleaned and sanitized daily, according to the management. The procedure is to pressure wash and sanitize daily with a foamer ([REDACTED]

[REDACTED]) and chlorine-based sanitizer

[REDACTED] . An acid wash with

[REDACTED] is done once a week. Cleaning and sanitizing logs are maintained but logs for November were not available for inspection at the time of the site visit (see Exhibit 20 for example).

Workers are issued re-usable gloves and hairnets that are replaced twice a week. If the product is field cored, sleeve protectors (if desired) and aprons are issued also.

According to the Director of Food Safety, the sanitizer level for knives and glove dip is normally tested three times a day. At the time of our visit, sanitizer was not tested because the firm had recently changed sanitizers and did not have the proper test strips for the new sanitizer. Gloves are disinfected by dipping in a bucket containing the sanitizer before work and after lunch. The knives used for harvest are stainless steel with polyethylene handles. Knives are left at the work station when the workers take a break or use the restroom. Workers use knife sheaths for safety reasons if they are not using the knife. Workers do not take the knives home, according to T&A management.

Toilet facilities are maintained by Star Sanitation in the equipment yard where they are stored at the end of the day. The facilities were supplied with soap, water and towels at the time of our visit. A spreadsheet showing cost of services and service provided may be found in Exhibit 15.

The plastic harvest bins are used for shipment in California while cardboard bins are used for out-of-state shipments. The plastic liners are one-time use, and completely cover the lettuce. Cardboard bins are collapsed and shipped back from the processor to the cooler for reuse. The bins are transported from the field to the cooler on a flatbed trailer pulled by a tractor.

Farm Investigation: Garcia and Church, LLC (G&C)

Church Brothers, LLC

1113 Harkins Road

Salinas, California 93901

Contacts: Mr. Steve C. Church, Sales Manager

Mr. Art Munoz, Agriculture Operations Manager

Phone contact was made with Mr. Steve C. Church, Sales Manager, who designated Mr. Art Munoz, Agriculture Operations Manager, to provide information and documents to CalFERT investigators. Church Brothers both markets and ships iceberg lettuce grown by Garcia and Church. Documents furnished by Taco Bell Corporation to FDA (see Traceback section) and by Church Brothers (Exhibit 21) identified 3 G&C fields in Huron which supplied lettuce during the time period of interest. The fields were identified as: Ranch 18-1, Lot 9-1; Ranch 27-4E, Lot 11; and Ranch 27-4W, Lot 11-2.

Garcia and Church, LLC (G&C)

Business office: 1046 Kensington Ave., Lemoore, CA 93245

Equipment yard: 2762 Oakland Road, Five Points, California 93247

Contact: Mr. Mike A. Garcia, Owner

On January 8, 2007 CalFERT investigators met with Mr. Mike A. Garcia, co-owner of Garcia and Church at the equipment yard at the Five Points facility. Mr. Steve C. Church is also a co-owner of Garcia and Church (G&C). A map showing location of the fields identified as supplying lettuce for the Taco Bell restaurants implicated in the outbreak may be seen in Exhibit 22. Ranch 18-1, Lot 9-1 is located on the west side of South Butte Avenue in between West Cadillac Avenue and West Jeffrey Avenue. Global Positioning Satellite (GPS) coordinates are shown in Attachment 5. There were no livestock observed in the immediate area of the field. There is residential housing along the east side of South Butte Avenue and some houses west of South Butte Avenue. One house, with adjacent yard, is inside a field adjacent to Lot 9-1 to the east. The western edge of this lot is approximately 750 feet from the eastern edge of Lot 9-1. There was no crop in this field at the time of the visit. There is an approximately 700 foot long holding pond located about 1000 feet north of the northwest corner of this field. This pond appeared to be a catch pond for the neighboring property.

Ranch 27-4E, Lot 11 and Ranch 27-4W, Lot 11-2 are adjacent to each other. Ranch 27-4E, Lot 11 is bordered on the east by California Highway 269. The west edge of Ranch 27-4W, Lot 11-2 is a quarter mile east of South Trinity Avenue. Both fields are directly north of West Packard Avenue. GPS coordinates are shown in Attachment 5. At the time of visit, both fields had a cover crop (wheat or barley) that was approximately three inches high. A third of a mile north of these fields was the University of California Davis' West Side Research and Extension Center, 17353 W. Oakland Ave., Five Points, CA 93624. Two raised reservoirs are located on the south side of the research center property. Water in the reservoirs comes from Westland Water District, except during drought when well water is used. The reservoirs feed by gravity the irrigation system at the research center. The Center's research projects are focused on crop agriculture. According to Dr. Robert Hutmacher, Director of the Center, no livestock were present and no compost had been recently used. The lettuce fields were leased by G&C for one year from Conejo Farms and Conejo Farms 2 (dba Five Star, 25474 S. Butte Ave., Five Points, CA 93624). Crop rotation practices were described by Mr. Garcia. After the G&C lease expires, the owner of Five

Star usually plants wheat or barley cover crop, turns it over, and then plants tomatoes or cotton. Lettuce fields were watered by overhead sprinklers until germination (about 1 month following planting) and then switched to furrow irrigation. All irrigation water was supplied by the California Aqueduct through the Westland Water District. Water samples from the California Aqueduct are taken periodically and are sent to BSK Labs for testing. Results of testing on a sample taken September 29, 2006, at Milepost 146.17 showed 8 MPN fecal coliform/100 ml and 30 MPN total coliform/100 ml (Exhibit 23).

Mr. Garcia stated that no manure or compost was applied to the fields to the best of his knowledge. Chemical fertilizers were supplied by Western Farm Service (16275 9th St., Huron, CA 93234) and were applied twice during the growing season, the last time approximately six to eight weeks prior to harvest (Exhibit 24). Pesticides are applied by Huron Ag Helicopter Inc. (38555 S. El Dorado Ave., Coalinga, CA 93210) and Precision Ground Services (13498 15th Ave., Hanford, CA 93230) using tractor-pulled rigs or helicopter spraying. Applications were made seven times between September 1, 2006, and October 20, 2006, for Field 18-1 Lot 9. Applications were also made on Fields 27-4E-11 and 27-4W-11 six times between September 4, 2006, and October 17, 2006 (Exhibit 25). Water used for the herbicide mix is from the Aqueduct, supplied by Westlands Water District. Pesticide applications must be at least 14 days prior to harvest, according to Mr. Garcia.

CalFERT Environmental Sampling: Garcia and Church Farms

On January 9, 2007, investigators collected eight environmental samples from G&C Farms. Investigators attempted to locate sample collection sites where *E. coli* O157:H7 would be most likely to survive. Four samples (sediment and water) were taken around Ranch 18-1, Lot 9-1. Two cover crop samples were taken from Ranch 27-4E, Lot 11. Two soil samples were taken from Ranch 27-4W, Lot 11-2. GPS coordinates for sampling locations are shown in Attachment 4. All eight samples were negative for *E. coli* O157:H7.

Harvester Investigation: United Ag Labor Service, Inc.

Garcia and Church is harvested by United Ag Labor Service, Inc. (UALS) located at 1204 W. Cook St., Santa Maria, CA 93458. The harvesting company was in California's Imperial Valley during the time of the initial investigation. CalFERT investigators subsequently interviewed owner Juan de la Torre and Brian Church on May 8, 2007. The crop being harvested at that time was the same as the suspect crop, cleaned and cored iceberg lettuce. Spray water used on post-harvest lettuce in the Huron area was from the City of Huron. A city employee verified that city water was supplied to Church Brothers, but was not able to supply an invoice to document the sale. Mr. de la Torre thought that the chlorine concentration used was 180-200 ppm, but the values recorded in the log shown to the investigator were 9-10 ppm free chlorine. Measurements taken on-site by CalFERT members were 5 ppm free chlorine (measured with SenSafe free chlorine check strips,) and an ORP of 675 mV (Oakton ORP Testr).

Harvest equipment is owned by UALS and is not shared with other harvesters. The equipment is cleaned thoroughly at the end of the day with a hot water pressure washer and sanitized with chlorine sanitizer (same concentration used for product spray, according to Mr. de la Torre). Harvest equipment is also cleaned and sanitized before use in the morning. The provided SOPs also directed the use of a foaming detergent prior to rinsing and sanitization (Exhibit 25). Written logs of the cleaning and sanitizing were maintained by UALS. Logs for the weeks of November 5, 2006, and November 12, 2006, were provided (Exhibit 26). Investigators noted that the log for November 5 to November 10 should be for Sunday through Friday, but the log is filled out for Monday through Saturday.

Workers were wearing gloves, aprons, hairnets, and sleeve guards at the time of our visit. Beard/mustache guards were observed to be in use. A hand sanitizer dispenser [REDACTED] was located on the harvest equipment for use after breaks or using the restroom. Gloves are replaced every 2 days for clean and core harvests, but every day for conventional harvest. Portable toilets were appropriately placed and stocked with water, soap, and towels and are serviced every other day by AAA Quality Services (dba Potter's Portapottie), 9624 19th Ave., Lemoore, CA 93245. The water from hand washing flows into a tank for later disposal and does not flow to the ground. At least two portable toilets are provided per seventeen person work crew.

Knives are issued by the employer and are not taken home with workers, according to Mr. de la Torre and the written policy provided (Exhibit 25). The sanitizing dip station for the knives is filled with the same solution that is sprayed on the product, according to Mr. de la Torre. A log of free chlorine concentration measurements was shown to the CalFERT investigator during the site visit. According to the written Glove and Knife Sanitation Policy (Exhibit 25), the knives are cleaned and sanitized at the end of the work day and before they are distributed to the harvesting crew the following day. The sanitizing solution used for this purpose is between 10 ppm and 50 ppm free chlorine, according to the written procedures..

The harvest bins are provided by Ready Pac at the T&A cooler in Huron (staging area for Ready Pac), and are either cardboard (for shipment to the East coast) or plastic (for the Irwindale facility). Both types of bins are lined with a single use plastic liner.

The harvest crew are permanent employees of UALS. According to Mr. de la Torre, worker training (conducted in Spanish and English) includes such topics as hand washing before and after eating, no eating in the field, not working when ill, as well as pesticide handling practices and sexual harassment training. The workers are also told to report anything unusual to their supervisor. Illness records are kept in the office.

Cooler Investigation

Tanimura & Antle, Inc., Tres Picos Cooler
20009 South Derrick Ave., Cantua Creek, CA 9360

The Tres Picos cooler was not operating at the time of our visit on December 16, 2006. This cooler was used for lettuce harvested from both T&A and G&C fields. The following information and documentation was provided by Mr. Robert Mills and Mr. Jad Crusha. The lettuce is transported from the field to the cooler on a flatbed trailer pulled by tractor. Iceberg lettuce is subsequently cooled in the bin in a vacuum tube with no water added in the process. A daily log detailing each batch's incoming temperature, temperature after cooling, and time in and out of the cooler is recorded (Exhibit 27). After cooling, the bins are nitrogen flushed and the bin liner is sealed. Transport from the cooler to the processor is the responsibility of the customer. The vacuum tubes are rinsed with water daily and sanitized with [REDACTED] acid cleaner [REDACTED] weekly. Sample equipment sanitation logs (Exhibit 29) show washing vacuum tubes daily with chlorinated alkaline cleaner solution after rinsing with potable water. Water at the cooler is Aqueduct water treated by filtration and chlorination to meet drinking water standards. Treatment and monitoring is done by California Water Services (700 W. Elm Street, Coalinga, CA). See Exhibit 29 for a statement of services provided. The cooler is audited for compliance with Good Manufacturing Practices (GMPs) by Scientific Certification Systems (SCS, Emeryville, CA). An audit conducted on October 26, 2006, gave the facility a score of 97.4% (Exhibit 30).

Summary of Observations

Based on production and shipping records reviewed by the FDA, CalFERT conducted several environmental investigations at the growing fields of T&A, G&C and the T&A Tres Picos Cooler at Cantua Creek. These investigations consisted of interviewing the firm's management, obtaining harvesting records, inspecting the firms' operations/ equipment, and collecting environmental samples.

- During the initial investigation at T&A, thirteen fields were observed to be disked under with no harvesting occurring at the time. Samples of lettuce remnants in addition to soil and sediment samples were collected. There were no significant signs of recent animal activity.
- Implicated fields at G&C were also observed during this same period. Although no evidence of recent animal activity was observed, Mr. Garcia stated that he had periodically observed gophers, mice and small birds. The three suspect G&C fields had been disked under with no vegetation present on one field, and cover crop on two fields. Environmental samples of cover crop, sediment, soil, and water were collected at these locations.
- By the end of this investigation, CalFERT had collected 26 samples at T&A Inc. and 8 samples at Garcia and Church for a total of 34 samples (Attachment 4). None of the samples tested positive for *E. coli* O157:H7. No readily identifiable risk factors were observed at the visited firms.

List of Exhibits

1. Traceback documents for lettuce provided by Yum!, parent firm of Taco Bell Corporation (11 pages)
2. Planting and harvesting records for T&A in Huron for Fall 2006 (2 pages)
3. Planting and harvesting records for G&C in Huron for Fall 2006 (1 page)
4. Shipping records for lettuce shipped from Huron T&A to Ready Pac, NJ (69 pages)
5. Bills of lading for lettuce shipped by T&A to Ready Pac in Florence, NJ (17 pages)
6. Excel pivot table provided by Ready Pac showing lettuce shipments for Taco Bell (electronic copy only)
7. Maps of T&A Tres Picos Ranch showing (a) all fields color-coded to indicate ownership (1 page), and (b) with the 13 initially implicated fields indicated and visited (1 page).
8. Huron Tanimura & Antle Spring, Summer, and Fall 2006 crops on 13 suspect fields and fields adjoining the 13 suspect fields (15 pages)
9. Microbiological Water Testing Results for California Aqueduct water by Primus Labs, October 02, 2006 (1 page)
10. Microbiological Water Testing Results for California Aqueduct water by BSK Food and Dairy Laboratories, October 12, 2006 (2 pages)
11. Standard Operating Procedure for cleaning spray rigs at end of applicators' shifts (1 page)
12. Water and Fertilizer Schedule, T&A (13 pages)
13. Pesticide Use Report, T&A (27 pages)
14. Fertilizer analysis and test results, T&A (15 pages)
15. Invoicing for servicing portable toilets by Star Sanitation (1 page)
16. Good Agricultural Practices (GAP) Food Safety audit by Scientific Certification Systems, October 26, 2006 (29 Pages)
17. T&A internal GAP Audit, October 16, 2006 (3 Pages)
18. T&A GAP training document for employees and visitors (2 pages)
19. Invoices for water treatment at harvest yard/shop provided by Westside Water Conditioning (10 pages)
20. Sample cleaning and sanitizing log for T&A harvest equipment (1 page)
21. Church Brothers Huron lettuce schedule and shipping record for G&C lettuce shipped to Ready Pac, Irwindale, 2006 Fall (8 pages)
22. Map showing G&C fields for lettuce, 2006 Fall (1 page)
23. Microbiological water testing results for California Aqueduct at Milepost 146.17 by BSK Food and Dairy Laboratories, September 29, 2006 (2 pages)
24. Fertilizer and pesticide applications for G&C fields (41 pages)
25. Equipment cleaning and sanitizing and glove and knife sanitation policy, United Ag Labor Service (5 pages)
26. Sample equipment cleaning and sanitation log, United Ag Labor Service (6 pages)
27. Cooling log for T&A Tres Picos Cooler (1 page)
28. Sample equipment sanitation log for T&A Tres Picos Cooler (2 pages)

29. Statement of services provided to Tres Picos Cooler by California Water Services for maintenance of water treatment facility (2 pages)
30. GMP audit of Tres Picos Cooler by SCS on October 26, 2006 (23 pages)

List of Attachments

1. Firm contact information (1 pg.)
2. Purchase Order and Lot Information of Implicated Shipments (1 pg.)
3. Location of sampling of California Aqueduct, October 12, 2006, by Westland Water District (GPS coordinates) (1 pg.).
4. Sample summary (1 page)
5. Growing field GPS coordinates (1 pg.)