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Arizona Leafy Greens Food Safety Training Kit

Pre-Harvest and Daily Harvest Environmental Assessments Workbook

Harvesting Safe
Arizona Leafy Greens

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General Information

The objective of this program is to teach Supervisors and food safety personnel how to perform "Pre-Harvest and Daily Harvest Environmental Assessments." This workbook is part of the Arizona Leafy Greens Food Safety Training Kit, and it was created to help leafy greens professionals conduct Environmental Assessments. This program was designed with the premise that people learn by doing. The information in this program is presented through a brief explanation of the concepts and several activities, case studies, and quizzes. This will help participants to practice and to apply content that ultimately will lead the assessors to grasp the "Environmental Assessment" concepts by applying their critical thinking skills.

The instructor will serve as a facilitator and will guide the participants through the content of the program. Therefore, it is important that the instructor becomes familiar with this training program and relates it to his/her company's policies and procedures.

The program in this workbook is divided in three sections: basic concepts, Environmental Assessment areas and mastering Environmental Assessments. Each section contains several subsections that outline the basic concepts to learn along with activities designed to test comprehension.

All activities in the workbook are titled, Putting your Knowledge into Practice. Each activity contains different case studies, quizzes, etc. There is also a knowledge test at the end of the workbook that may serve to evaluate the extent to which the participants learned the material.

Target Audience

This workbook was developed for anyone who is asked to conduct field food safety Environmental Assessments. Harvest Supervisors or Foremen, Quality Control Personnel, Growers, Food Safety Professionals and Food Safety Personnel are the primary audience.

Section 1. Introduction – Basic Concepts

1.1 **Key Concepts: Pre-Harvest Assessment, Daily Harvest Assessment, Form, Log or Checklist, and Documenting an Environmental Assessment.**

The company that you work or harvest for has implemented a food safety program that is based on the Arizona's Commodity Specific Food Safety Guidelines for the Production and Harvest of Lettuce and Leafy Greens. A very important part of your job is to prevent the leafy greens you work with from becoming contaminated so that they don't cause a foodborne outbreak.

Customers who buy leafy greens request that your company provide third party food safety audits and proof of implementation of food safety programs in their fields and facilities to assure safe produce to their consumers. A food safety program is a documented set of steps based on industry and government standards and procedures aiming to minimize the risk of leafy greens contamination. There are many activities on all ranches that need to be properly conducted as part of the company's food safety program.

One of the key activities required in a leafy greens food safety program is the development of Environmental Assessments. Each company conducts food safety Environmental Assessments on all ranches where leafy greens are grown and harvested to check if the company's standard operating procedures are being followed. In this workbook you will learn to conduct Pre-Harvest and Daily Harvest Environmental Assessments.

1.2 What is an Environmental Assessment?

The first thing you need to learn is what an Environmental Assessment should be. In order to be aware of the conditions associated with the production of lettuce and leafy greens, the fields where leafy greens are grown need to be periodically monitored. According to the Arizona LGMA food safety standards, this monitoring is mandatory and is known as an "Environmental Assessment."

This monitoring requires visual observation of field conditions with a focus on potential physical, chemical and biological contaminants. In the assessment, you are also checking to see if you are conducting your standard operating procedures in the way they have been outlined by the company's food safety team.

This visual monitoring of field conditions is a formal food safety Environmental Assessment that needs to be documented and filed because it will be required during audits. Your job includes monitoring the fields and documenting the inspections.

In other words, you are the person in charge of conducting the Environmental Assessments. Thus, you should be aware that the information provided by these inspections is key for the company's food safety program.

The people you see in this picture are visually inspecting a field. During this lesson you will learn to conduct Environmental Assessments. It is OK to find non-conformances during your assessments. In fact, that is the major point of the assessments: to look for non-conformities or deficiencies and correct them, immediately.

1.3 Documenting an Environmental Assessment

The information you collect during the Environmental Assessment is documented on forms, logs or checklists. This information will be used as evidence that you have an effectively managed food safety program in place on the ranch. You need to conduct the following assessments:

(1) One is done within the week prior to harvesting. This is known as the *"Pre-Harvest Assessment"* and is conducted 1 to 7 days before harvesting.

(2) The *"Daily Harvest Assessment"* must be done each day of the harvest before starting to harvest in that specific block.

(1) Pre-Harvest Assessment - within one week prior to harvesting

(2) Daily Harvest Assessment - on the harvesting day

There is little difference between the two types of inspections (Pre-Harvest and the Daily Harvest) because you will need to perform the following tasks in both:

- Walk through the entire field doing a visual inspection of the field.
- Answer the questions from the form, log or checklist that was provided.
- Check for everything that is noted in the checklist.
- Carefully record all the information from your visual inspection.
- Immediately call your Food Safety Professional if you see something that could represent a food safety risk to the fields and always ask for guidance.

Forms, logs and checklists are simple and easy to use documents that ensure that specific food safety tasks are completed and specific information collected. These documents help Food Safety Professionals make certain nothing is ignored. Documents should have questions or statements that direct you to visually assess the surrounding area and provide verification of your findings. Your Food Safety Professional will provide you with a form, log or checklist that you will need to fill out when visually inspecting a field.

This may seem like an easy task, and it is, but it carries a big responsibility. Pay attention to all details and if you have any questions when inspecting the fields, ask your Food Safety Professional.

The following sample checklists are also included in the Activity Book.

DAILY HARVEST ASSESSMENT

Harvest Company's Name and Contact Information	Harvest Food Safety Supervisor	Crew Foreman	Crew#	Ranch	Lot	Assessment Date

All items must be checked ongoing during the day! (Indicate: Yes: y or √; No: n; Not Applicable: N/A)	Yes	No	Comments/Action taken
ANIMAL INTURSION/ FECAL MATTER			
Is the block free of the presence or evidence of animal hazards and/or feces? If not, is the hazard:			
LOW risk? Please document whether the Companies SOP's were followed?			
MEDIUM/HIGH risk? Please document that the required LGMA buffers were implemented and documented.			
HARVEST EQUIPMENT			
Are cleaning and sanitation of all harvest equipment performed frequently during the day? (Before start, after breaks, organic changeover, field change and at end of day, or if contaminated)			
Are knifes, baskets, buckets and brushes washed and sanitized daily?			
Are knifes frequently sanitized? (before start, during breaks, con.-org. changeover and field change)			
Is the dip station clean and refilled with sanitizer? (before start, before breaks, etc.)			
Are Spray Packs cleaned and sanitized (Weekly or more often if needed)			
Are Spray Tanks cleaned and sanitized? (Weekly or more often if needed)			
Are Spray Nozzles operating properly? (Weekly or more often if needed)			
PRODUCT CONTAINERS			
Are packaging materials and containers covered while storing in the field over night?			
Are packaging materials and containers stored off of the ground, away from potential contaminates?			
Are containers and pallets clean and free of loose parts, loose soil, mud, oil, grease, etc.?			
Are packaging materials and containers only used to carry harvested product?			
Are packaging materials and containers inspected before use for damage, trash and debris?			
Are contaminated packaging materials discarded, contaminated totes washed properly?			
Have any foreign materials been found on the product, containers or packing material?			
SANITARY OPERATION OF EQUIPMENT			
Is harvesting equipment maintained and in good condition?			
Is harvesting equipment free of fluid leaks or excess of grease that would cause contamination?			
Are there loose or damaged parts on the harvest machine, tractor and trailers?			
Are trailers and/or refrigerated trailers inspected for cleanliness prior to loading?			
Are product container labels completed with correct information?			
WORKER PRACTICES			
Are there any employees who appear to be sick or with open wounds?			
Are the employees clothes clean, and appropriate?			
Are there any employees wearing jewelry or loose items in the actively harvested areas?			
Are there any employees eating, drinking, spitting, chewing gum/tobacco or smoking in actively harvested areas?			
Are employees wearing required protective equipment (hairnets, beard nets, clean gloves, sleeves and aprons)?			
Are personnel belongings stored outside the actively harvested area?			
Are employees washing their hands with soap and water before staring harvest, after breaks, and lunches and after visiting sanitary facilities?			
Are there any visitors in field?			
TOILET / HAND WASHING FACILITIES			
Are toilets maintained in good condition? (Check at least before start and before breaks)			
Are toilets supplied with toilet paper on a holder? (Check at least before start and before breaks)			
Have toilets been properly cleaned the day prior to use?			
Are hand washing facilities well stocked with potable water, soap in dispenser and single use paper towels?			

TIME:							
Spray nozzles chlorine level (100-200 ppm) free chlorine							
Knife dip station chlorine level (100-200 ppm) free chlorine							
Spray nozzles pH level (6.5-7.5) CHECK EVERY HOUR							
Knife dip station pH level (6.5-7.5) CHECK EVERY HOUR							
FOREMAN INITIALS							

Date checklist completed:		Signature of Foreman:	

Pre-Harvest Food Safety Environmental Field Assessment

Time & Date:	Estimated Harvest Date:	
Grower:	Ranch:	Lot:

Evaluation of Potential Risks:			Yes	No
1)	Is there presence or evidence of animal intrusion in or around the ranch (e.g. downed fencing, tracks, feeding, feces, fur, feathers etc.?)			
	1a)	If the answer to question #1 is "YES", was the contamination determined to be LOW or MEDIUM/HIGH risk? Please document:		
	1b)	If the risk was LOW, was the Company SOP for LOW risk followed?		
	1c)	If the risk was established to be MEDIUM/HIGH, were requred LGMA buffers implemented and documentation completed? Attach corrective action report.		
2)	Is there a history or evidence of flooding, CAFO, municipal waste, toxic waste, landfill, etc?			
3)	Are potentially contaminating materials (e.g. compost, CAFO, non-synthetic soil amendments, grazing, septic leach field, etc.) present in such manner as to pose a likely contamination risk to the field to be planted?			
4)	Is there any evidence that the irrigation water source and delivery system may potentially be compromised?			
5)	Is there any evidence that field workers have not complied with employee hygiene and sanitary facility rules as outlined in the company food safety programs?			
6)	Are there any other potential LGMA contamination risks or hazards present, including unexpected adjacent land activity present?			

Measurement Criteria and Verification

If the answer to any of the above questions is "YES", then the planting block should not be harvested unless remedial action has been completed.

Was the field harvested? (circle one)	Yes	No

Actions Taken or Additional Comments: _____

Person Completing Pre-Harvest Inspection: _____

This assessment is limited to the time and date of the assessment and inspector does not assume responsibility for other potential hazards that might be found or occur outside of above time frame.

1.4 **Group Activity – Discovering a Form, Log or Checklist**

Purpose of the Activity:

To become familiar with the Pre-Harvest and/or Daily Harvest Environmental Assessments' forms, logs or checklists.

Supplies:

Provide each participant with one copy of a generic form, log or checklist or your company's actual form, log or checklist used to conduct Environmental Assessments.

Procedure:

1. Tell the group that you have provided the form, log or checklist used to conduct the Pre-Harvest and/or Daily Harvest Environmental Assessments.

2. Ask for a volunteer to give a detailed description, with his/her own words, of the entire form, log or checklist. After he/she has done it, go to step 3.

3. Take participants through each section of the form, log or checklist leading the following discussion:

A. The first section of most Environmental Assessment forms, logs or checklists asks for the following basic information:

[The instructor needs to provide a brief explanation of each bullet point.]

- **General information**
- **Name of the person completing the inspection**
- **Date of inspection**
- **Estimated harvest date**
- **Ranch and lot**
- **Harvester name**
- **Product to be harvested**
- **Harvesting crew number/ID**

Ask each person to fill out the general information section on the provided checklist.

Point out to participants that they should always use permanent ink when completing a food safety form, log or checklist. The use of a pencil or erasable ink is not allowed.

White outs with correction fluid are not permitted for making corrections on the documents. Any mistake must be crossed out and initialed by the person making the change. The original information must be legible. Show participants how this is done in your company.

[In the next section the instructor will just briefly go over each bullet point.]

B. The next section in any form, log or checklist, is the core of the assessment. It is generally titled: "Evaluation of Potential Contamination Risks". It includes a series of questions for evaluating many areas in the field that may be potential sources of contamination to leafy greens. Remember that you ALWAYS need to visually inspect the field before filling out the form, log or checklist form.

Most questions are Yes or No and they address the following points:

- Evidence of animal intrusion in the block

  (low hazard & medium / high hazard.)
- Evidence of livestock grazing on immediately adjacent land.
- Evidence of flooding, CAFO, municipal waste, toxic waste, landfill, etc.
- Condition of water source and distribution system.
- Employee hygiene practices.
- Field sanitary facilities.
- Unexpected adjacent land activity that will pose a risk to food safety.
- Any other potential contaminants such as:
  - Harvest equipment.
  - Product containers.
  - Sanitary operation of equipment.
  - Sanitizer concentration.

Note that the information in each checklist will vary from company to company due to the differences in their food safety policies. Later in this workbook we will cover them in detail, and we will come back to the sample questions included there.


Animal Intrusion
Grazing
Flooding
Water Source & Distribution System
Employee Hygiene
Field Sanitary Facilities
Adjacent Land Activity
Other Contaminants

C. The last section on the form, log or checklist form is used to record any Corrective Actions that need to be implemented in that specific field.

[Explain the definition of Corrective Actions to the group. You can use the definition included below]

A Corrective Action is a change or an improvement made in the field to address a deficiency or to eliminate causes of non-conformities or other undesirable situations in the fields that may pose a food safety risk to product.

Depending on the non-conformity or deficiency found during the Environmental Assessment, the Food Safety Professional will have to determine the best Corrective Action for your company. Most of the time, Corrective Actions include the creation of a "no harvest" buffer or separation zone around the potentially contaminated area. The Corrective Action must be in accordance with your company's food safety plan.

If any Corrective Action is taken, you need to document it in detail in the designated space in the form, log or checklist. In some instances you must call your Food Safety Professional before implementing a Corrective Action. Always follow your company's policies.

[Ask participants: what are the Corrective Actions you are aware of?]

[Go over a couple of your company's policies for documenting Corrective Actions.]

4. Discuss the following messages about good documenting practices:

Writing down the proper information is an easy but tedious task. There are many good documenting practices that must be followed while filling out forms, logs or checklists:

- The information you provide on the form, log or checklist must be correct and accurate.
- Make sure you complete all sections.
- If you have any questions such as not being sure of the proper name of the ranch you are assessing, call your Food Safety Professional immediately. Do not use the ranch's nickname; the auditors do not know them.
- Do not fill out the forms in advance. This practice is not acceptable because doing so means that you are not visually inspecting the fields. Furthermore, this is considered falsification of records, which is a major deviation in a food safety audit.

1.5 Putting Your Knowledge into Practice - Acceptable or Not Acceptable

Write an **A** next to the statement if the practice described is acceptable while conducting a food safety environmental assessment. Write **NA** if the situation is not acceptable and may cause a food safety risk to leafy greens. Discuss each situation with the group after they have completed the activity.

_____ Isaac is conducting a Pre-Harvest Environmental Assessment at 3 fields the week before they will be harvested. These fields have been owned by the company for 10 years and have never had any problems. Isaac has a doctor's appointment, and he is in a rush. He decides to stop by the fields and fill out the form, log or checklist from the back of his truck since the fields have never caused problems.

_____ Juanita lost a clipboard containing 15 Daily Harvest Assessment checklists that she did on a field last month. She filled out new ones at once and gave them to her Food Safety Professional.

_____ Alberto found tracks inside a field, but he is not sure what kind of animals produced the tracks. Before making a decision to harvest the field, he calls his Food Safety Professional, who then comes to the field and implements a Corrective Action.

_____ Monica's truck broke down in the morning; she was immediately provided with another company vehicle. She left her clipboard with the Daily Harvest Assessment checklists in her truck and decides to give the go ahead to start harvesting in a field that is only 5 minutes away from her Food Safety Professional's office.

_____ Luisa likes to fill out the Environmental Assessment checklists with pencil and then mark the checklists with a permanent ink pen during her break. Her checklists are generally scratched and disorganized but legible.

1.6 Putting Your Knowledge into Practice – Quiz

Circle the correct answer to each question. There is only 1 right answer per question. Discuss each question with the group after they have completed the activity.

1. When is the "Pre-Harvest Environmental Assessment" conducted?

a. Two weeks before harvesting.
b. The day before harvesting.
c. One to seven days before harvesting.
d. Each day of harvest before harvesting begins in that specific block.

2. There are not many differences between the Pre-harvest and the Daily harvest assessments. In both of them you will need to:

a. Walk through the entire field doing a visual inspection of the field.
b. Answer the questions from a provided form, log or checklist.
c. Carefully record all the information from your visual inspection.
d. All of the above.

3. Which statement is NOT TRUE about "Corrective Actions?"

a. It is defined as a change or an improvement made in the field to address a deficiency or to eliminate causes of non-conformities or other undesirable situations in the fields that may pose a food safety risk to leafy greens.
b. It includes the creation of a "no harvest" buffer or separation zone around the potentially contaminated area.
c. There are many different Corrective Actions that need to be taken depending on the issue that needs to be addressed.
d. If a Corrective Action needs to be implemented the Food Safety Professional/personnel does not have to document it.

4. There are many good documenting practices that must be followed while filling out forms, logs or checklists. Which of the following statements is not a good documenting practice?

a. The information the Food Safety Professional provides in the checklist is correct and accurate.
b. The Food Safety Professional uses permanent ink and no white out is used on the forms.
c. If the field assessor has any questions, he calls the Food Safety Professional immediately.
d. The Food Safety Professional fills out the forms, logs or checklists in advance.

5. When is the "Daily Harvest Assessment" conducted?

a. Two weeks before harvesting.
b. The day before harvesting.
c. One to seven days before harvesting.
d. Each day of harvest before harvesting begins in that specific block.

Section 2. Pre and Daily Harvest Assessment / Inspections

In this section of the program we will review each area that needs to be addressed in the "Pre and Daily Harvest Environmental Assessment/Inspection" forms, logs or checklists. We will walk you through the different common sections of a typical food safety Pre and Daily Harvest Environmental Assessment form, log or checklist and provide you with basic information on how to approach them. Keep in mind that although most forms, logs or checklists are similar, there are some specific requirements at each company.

[It is important for the instructor to elaborate that each company operates differently and has different policies.]

2.1 Field Sanitary Facilities

The company has Standard Operating Procedures (SOP) that outline the field sanitary facility program. The SOP is a written document or instruction detailing all steps and activities of a process, procedure or program. Your field sanitary facility program SOP outlines the location and frequency of cleaning the units, supplies, signs, maintenance, servicing and response of the unit. It is your job to get to know this SOP since your environmental assessment covers a detailed inspection of the field sanitary units to evaluate if the company's procedures are being followed properly.

In general, the field sanitary facility program addresses the following basic areas. During the assessment you should visually inspect the following points for all toilets and sanitary facilities:

Location: Make sure the location of the units minimizes the impact from potential leaks and/or spills while still allowing access to employees and access for cleaning and service. The location and sanitary design of toilets and hand washing facilities should be carefully selected to facilitate the control, reduction and elimination of disease-causing microbes. An industry best practice is to locate them away from the field. Make sure they are placed according to your company's policy.

Number of facilities: There should be at least 1 restroom per 20 employees located within a ¼ of a mile, or no more than a 5 minute walk from the workplace. If during your assessment you find too many employees and too few restrooms, call your Food Safety Professional immediately to take a Corrective Action. Men and women restrooms may be needed based upon the number and gender of employees.

Cleanliness: If the units are not clean, Corrective Actions need to be followed. You must open the door and look inside each toilet unit to make sure things are satisfactory. The sanitation and service log should also be up-to-date.

Supplies: Enough water, soap, toilet paper, paper towels and a trash can should be available at all times. Establish equipment, supply storage, and control procedures when not in use. Are supplies stored onsite? Are there enough? Are they located within reach of the person in charge? Are all soap containers properly labeled?

Facility signage: There should be a sign posted to remind employees to wash their hands after using the restroom and/or before returning to work in the field. Look for it when assessing the areas. If the signs are missing, the company's SOP is not being followed, and something needs to be done. Be sure to post signs in workers' primary language.

Facility daily cleaning and servicing: Establish the frequency of toilet and hand washing facility maintenance/ sanitation. Has everything been cleaned and sanitized?

Facility maintenance: The sanitary facility must be in good condition and properly maintained. If you note any issues related to this, you should document them in your form, log or checklist.

Response plan for major leaks or spills: Sanitary facilities should be placed so that the location minimizes the impact from potential leaks and/or spills while allowing access for cleaning and service. If there is a leak or spill, you should follow your leaks and spills response procedure.

Thorough Inspection

Keep in mind that infractions and deviations are assigned to companies that miss any of the points that have been discussed. Make sure to carefully look at all points, take your time to walk around and inside the units while you are in the fields doing the assessment. Maintain documentation of maintenance and sanitation schedules. Your job can be the difference between safe or contaminated products.

2.1.1 Putting Your Knowledge into Practice – Case Studies

Let's review some examples of situations that can happen in the leafy greens fields and that are covered in this section. Using the information you learned, write down what you should do in each of the following 3 situations.

[Discuss the participants' answers with the group. Ask for volunteers to read their answers out loud.]

1. Olivia, the Assistant Foreman, gets to a field to perform the Pre-Harvest Assessment, and she discovers that the wind flipped over a portable toilet unit. What needs to be done?

2. During the assessment, Marcelo, the harvest company's Food Safety Professional, opens the water nozzle and carefully checks all hoses and connections. He discovers that there is a leak on one of the hand washing station lines. What needs to be done?

3. Teresa arrived very early in the morning to do her Daily Harvest Assessment, there were only a few employees in the field at that time. She opened the door of each one of the portable toilet units and discovered that the contracted company failed to service them. She also spotted one employee who was not washing his hands and following the appropriate standard operating procedure for hand washing. What needs to be done?

2.1.2 Putting Your Knowledge into Practice – Identifying Missing Items

Look at the picture/drawing and write down what is missing in this hand washing station.

1. _____

2. _____

3. _____

2.1.3 Putting Your Knowledge into Practice – What's Needed to Prevent Leafy Greens Contamination?

Write down the basic requirements for finding a spot to place a portable unit in the field. Where should it be located, and what are the main requirements that must be met?

2.2 Employee Health and Hygiene Practices

Good personal hygiene is critical for minimizing the risk of leafy greens contamination. It is essential to prevent the introduction and spread of disease-causing microbes and other physical or chemical contaminants in the growing and harvesting areas. Hence, your Environmental Assessment form, log or checklist includes specific questions for demonstrating evidence that field employees comply with the personal hygiene practices outlined in the company's food safety program.

Regardless of the questions included in your forms, logs or checklists, you must make sure that ALL employees working in the fields follow your company's policies. Some of the most basic personal hygiene general policies are included in the box below:

- Come to work clean and wearing clean work clothes.
- Proper hand washing.
- Removal of jewelry and other objects.
- Snacking, eating, drinking, chewing gum, smoking and using other tobacco products only in designated areas.
- Proper use of protective garments and clothing such as aprons, arm sleeves, hair restraints and gloves.
- Proper use and storage of harvesting hand tools such as knives.
- Personal items should be stored away from food production areas.
- No spitting, urinating or defecating in the field.
- Good personal health: workers should have no symptoms of illness, diarrhea, coughing, sneezing, runny nose, vomiting, jaundice, sore throat with fever, and other diseases.
- Wounds and sores should be covered.
- Proper procedures for contact with blood and body fluids should be followed.

TIP: When looking at employees, you should always think as an auditor, and remember that Foremen and Crew Leaders must also follow the company's personal health and hygiene policies at all times. Poor personal health and hygiene practices can be major sources of contamination.


NO
Urinating
Defecating Outdoors

2.2.1 Putting Your Knowledge into Practice - Case Studies

Let's review some situations that may happen in the leafy greens fields and have been found during actual assessments. Using the information you learned, write down what you should do in each of the following 3 situations.

[Discuss the participants' answers with the group. Ask for volunteers to read their answers out loud.]

1. Richard reported sick to work the day before and while doing your assessment, you can tell that his face is yellowish and that he frequently visits the restroom. What should you do?

_____

_____

_____

2. A couple of newly-hired employees have cell phone holders attached to their belts, and they are about to start harvesting. You also spot both of them with knives with no sheaths in their back pockets while warming up with the whole crew before entering the field. What needs to be done?

_____

_____

_____

3. A harvesting machine is broken, and maintenance is working on it. While employees wait for it to be repaired, they leave the harvesting area wearing their gloves and aprons on and go to sit in the dirt on the side of a ditch. What would you do in this situation?

_____

_____

_____

4. An employee is spotted not washing his hands after using the restroom. What should you do in this situation?

_____

_____

_____

2.2.2 Putting Your Knowledge into Practice – Your Company's Policies

List your company's employee health and personal hygiene practices and policies that you need to observe while conducting a Daily Harvest Assessment.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

2.2.3 Putting Your Knowledge into Practice – Risky Food Safety Practices

Look carefully at each photograph and find those that you think pose a food safety risk for lettuce and leafy greens that you must be alert to during the Environmental Assessment. Mark each risk with an X.

2.2.4 Putting Your Knowledge into Practice – Quiz

Circle the correct answer to each question. There is only 1 right answer per question. Discuss each question with the group after they have completed the activity.

1. Which is the only piece of jewelry allowed while working in a field?

a. A diamond ring.

b. Earrings.

c. A watch.

d. A plain, smooth wedding band.

2. Field workers must not eat, smoke, chew gum or drink beverages other than water while:

a. They are not using gloves.

b. They use the bathroom.

c. They are working in the field.

d. They are on a break.

3. When must gloves be changed or sanitized?

a. They are dirty.

b. They are torn.

c. When one sneezed and covered the mouth with the hand.

d. All of the above.

4. The arm covers are intended:

a. To prevent one's clothes from getting dirty.

b. To prevent one's clothes from getting wet.

c. To prevent the contamination of lettuce or leafy greens.

d. To protect you from contamination.

5. All pieces of jewelry must be removed before going to work on the field because:

a. They might get lost.

b. They can be a hassle while using arm covers and hairnet.

c. They may shine too much.

d. They can fall on the lettuce or leafy green vegetables and contaminate them.

6. What should you do if you cut your finger and start bleeding while picking up lettuce or leafy greens?

a. Stay in place and advise your supervisor immediately for evaluation of the wound and surrounding area.

b. Put another glove on.

c. Cover the wound with a bandage and put a glove on.

d. Leave the field immediately.

2.3 Condition of Water Source and Distribution System

Water is an important raw material in the leafy greens industry. It is widely used in the industry for many tasks such as irrigation, pesticide use, hand washing, drinking, cleaning and sanitizing of equipment and harvesting utensils.

There are different sources of water: wells, canals, reservoirs, and municipal. This water is distributed to the fields in many ways. Regardless of the source or distribution system, all water must come from a secure source. The water used throughout the operation must meet certain quality control parameters so it does not become a vehicle for the spread of disease-causing microorganisms and chemical contaminants.

The conditions of the water source and distribution system must be checked thoroughly in the Environmental Assessments. At a minimum you must make sure to check the following:

- The water source is in acceptable condition.
- All tanks are clean and all hoses are off the ground.
- Chlorinated water and chemical tanks are marked.
- Pipes and pumps are well-maintained and are working properly.
- Water sources are free of trash, debris and animal hazards.
- There are no potential contamination risks from reservoirs, canals, or any other open water sources (e.g. no dead animals, chemical leaks, etc. in the canals.)

Your company may use other tools such as sanitary surveys to check the water sources and distribution system. A sanitary survey is an inspection of the entire water system, including water source, facilities and equipment, for the purpose of identifying conditions that may result in microbial contamination. This assessment must be done prior to using any water source or if your microbiological testing counts at that location are high or out of specification.

2.3.1 Water from Reservoirs, Canals, Ditches, Rivers, Creeks

Let's get started with the surface waters sanitary survey. This includes water coming from reservoirs, canals, ditches, rivers, creeks, etc.

You should check for the following:

Animal hazards: Look for evidence of animal hazards. Take your time while looking for animals in canals, fecal deposits, or animal carcasses.

Contaminating waters: Look for dirty/contaminated water that may be draining into the reservoir or canal.

Test any waters of unknown quality. Redirect unknown waters with diversion dikes, gradients, drainage pipes, and inlet control structures or another method that is appropriate.

Caution should be exercised with back flushing filtration systems so that this water does not return directly to the source.

Cleanliness: Look for trash and debris accumulation. Even small amounts of food in water can provide food for microorganisms to grow. Audit reports have found trash and debris such as drinking bottles and cans in the water sources.

Vegetation: You must document any trees, bushes and tall weeds near or in the water source that may attract wild life, rodents or fowl. You may not see wildlife during your assessments but they may come when there are appropriate conditions, which excessive vegetation provides.

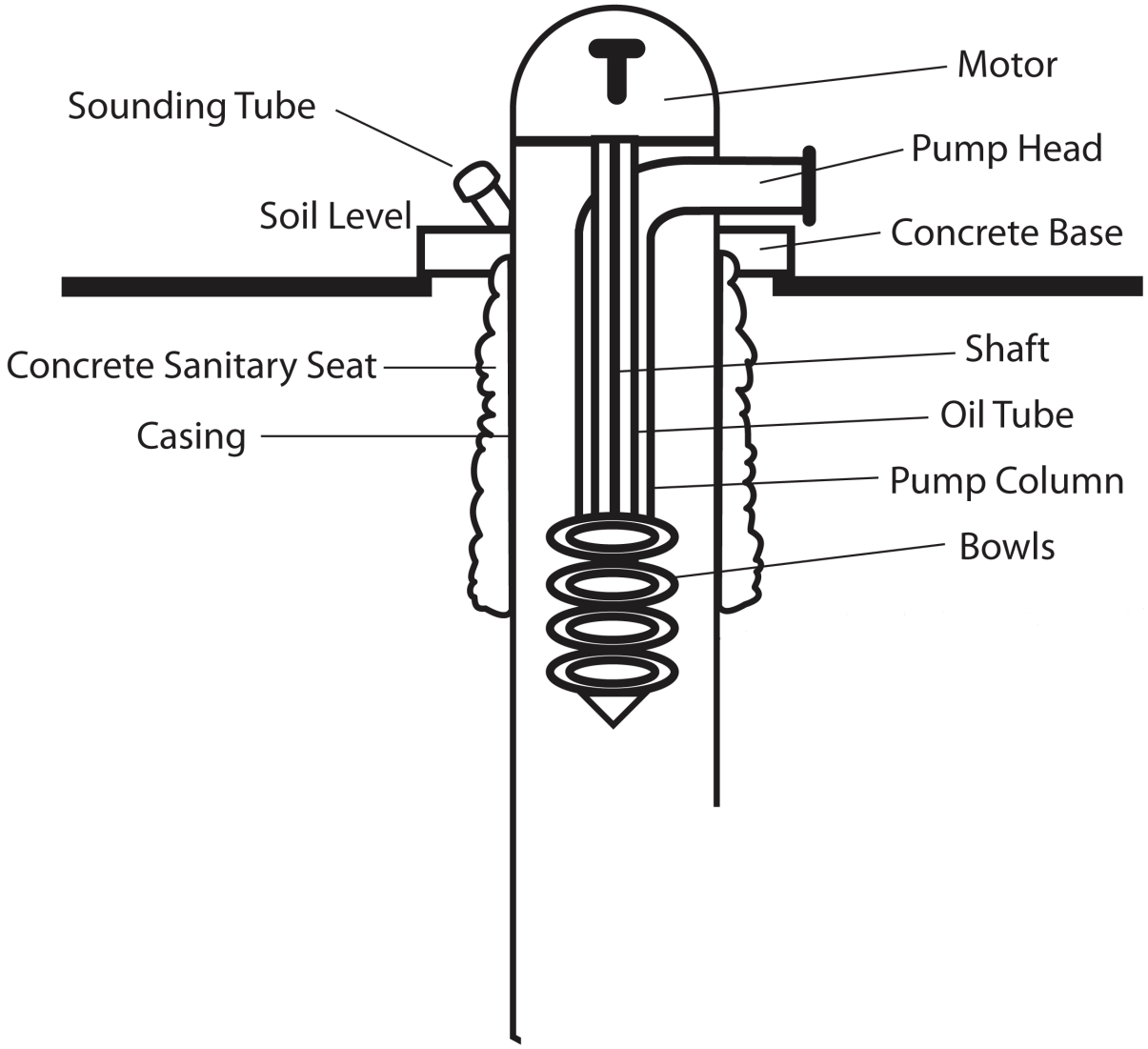
Surface water distance from hazards: Ensure buffer zones are created and enforced for biological, chemical and physical hazards (livestock, septic systems, irrigation systems, etc.). The following table outlines suggested buffer distances for specific risks. Please note that some customers or shippers may require distances different from this table.

Water Source	Metric	Consideration for risk analysis		
		Risk mitigation factors	**Increase distance**	**Decrease distance**
Surface water distance from untreated manure	At least 100 feet separation for sandy soil and 200 feet separation for loamy or clay soil (slope less than 6%; increase distance to 300 feet if slope greater than 6%) is recommended.	Topography: uphill from manure		X
		Topography: downhill from manure	X	
		Opportunity for water run off from or through untreated manure to surface waters	X	
		Opportunity for soil leaching	X	
		Presence of physical barriers such as windbreaks, diversion ditches, vegetative strips		X

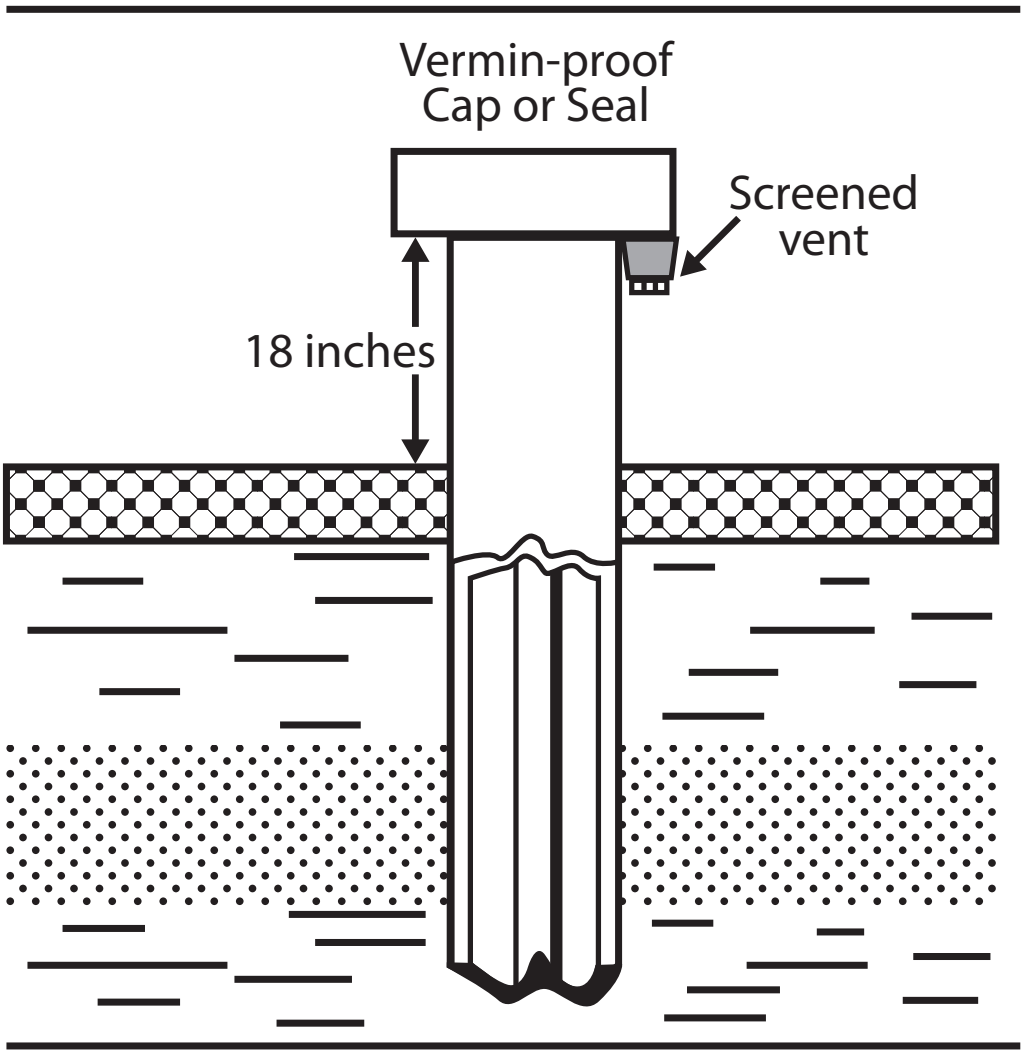
2.3.2 Water from Wells

If your water comes from wells you should inspect the following points.

Well casing: Listen for water running down into the well. If you can hear water, there could be a crack or hole in the casing. If you can move the casing by pushing against it, you may also have a problem with the integrity of the casing. The well casing should extend at least 18 inches above the ground.



Well cap or seal: The well should be completely sealed against surface water, insects or other foreign matter. Look for holes, missing plugs and leaking water (artesian flow). If water is coming out, then contaminants can seep into the well. Replace any missing plugs and seal any openings, gaps or cracks.



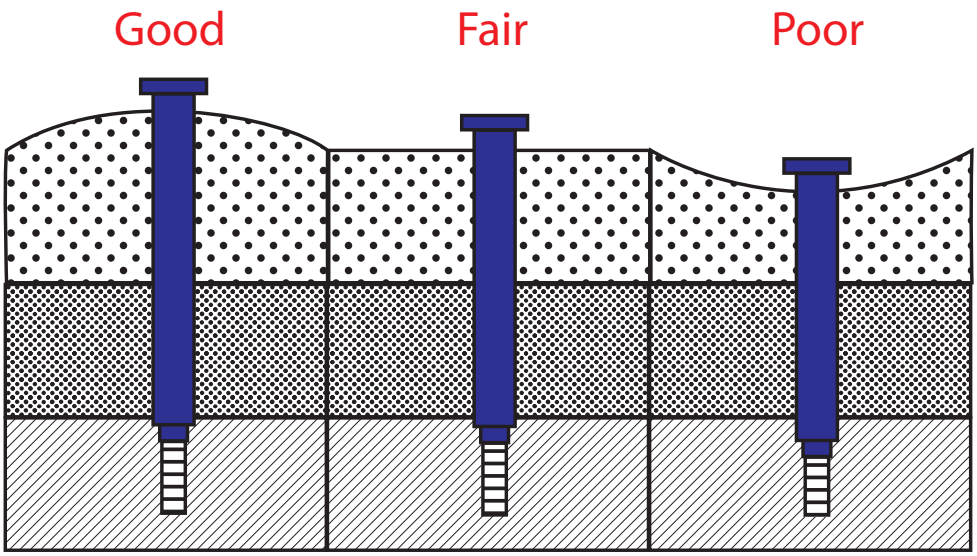
Well vent: Check the cleanliness and integrity of the well vent screen. Look for tears or holes. Vents must be covered with a screen. Replaced damaged vent screens.

Concrete well pad: Look for cracks that would allow water to enter the well casing. Seal cracks or re-pour a new concrete pad. Ground should slope away from well.

Well pump: Make sure the pump is operating properly and check for corrosion. Clean, repair or replace the pump.

Cleanliness: Look for debris. Manually remove debris. Document and correct any chemical, biological or physical hazards.

Gradient: Is there standing water around the well or water draining toward the well? Is the well downstream from a potential contaminant source? Re-grade around the well so the ground slopes away from your well. Move either the well or potential contaminant source.



Potential contaminant sources: There are set minimum horizontal distances from the wells:

- Any sewer: 50 ft.
- Watertight septic tank or subsurface sewage leaching field: 100 ft.
- Cesspool or seepage pit: 150 ft.
- Animal enclosure: 100 ft.

Water Source	Metric	Consideration for risk analysis		
Well Head Distance from Untreated Manure	200 ft separation of untreated manure from wells, although less distance may be sufficient.	Risk mitigation factors	Increase distance	Decrease distance
		Topography: uphill from manure		X
		Topography: downhill from manure	X	
		Opportunity for water run off from or through untreated manure to well head	X	
		Opportunity for soil leaching	X	
		Presence of physical barriers such as windbreaks, diversion ditches, vegetative strips		X

Please note that some customers or shippers may require specific distances different from these.

Animal hazards: Look for evidence of animal hazards. Take your time while looking for animals in canals, fecal deposits or animal carcasses.

2.3.3 Irrigation & Distribution Systems

Irrigation & Distribution Systems must also be checked:

Mechanical components: Check primary and secondary filtration equipment for cleanliness and proper function. Check for leaks on seals, gaskets and fittings.

Water lines: Check water lines for visual evidence of contamination.

Water distribution system: Check exposed components for any vulnerability to contaminants. Signs of damaged underground components may include unexplained erosion or patches of green grass.

Cross-connections to another water source: Check for an actual or potential physical connection between a water system and another water source of unknown or questionable quality.

2.3.4 Water Tanks, Containers and Equipment used for Hydration

The water storage tank site must be well maintained and properly graded. The tank should be located away from livestock and septic systems. Whether it is on the ground or elevated, the area around the base of the tank should be visible. It should be clean and free of debris and weeds.

On a quarterly basis, inspect each finished water storage tank to ensure:

- Structural soundness (interior and exterior damage or rust.)
- No vegetation is growing on tank.
- Access hatch lids are properly gasketed and secured.
- If vents are present, they should be adequately screened with a corrosion resistant material.
- The overflow and drain pipes are screened and have proper air gaps.
- Tanks should be cleaned every 3-5 years.

2.3.5 Putting Your Knowledge into Practice – What's the Right Procedure?

Table 1. Guidelines for Assessment of Surface Water

The following table contains 3 columns, the first one lists potential issues, the next one lists survey guidelines and the last one lists remediation guidelines (how to correct the issue). They are in the incorrect order and do not match. Match the number on the issue and the corresponding survey and/or remediation guideline accordingly. Discuss the participants' answers with the group. Ask for volunteers to read their answers out loud.

Issue	Survey Guidelines	Remediation Guidelines
1 Animal hazards	◯ Look for any type of trash and debris accumulation.	◯ Redirect contaminated water with diversion dikes, gradients, inlet/outlet control structures, etc.
2 Contaminated waters	◯ Look for dirty/contaminated water that may be draining into the canal.	◯ Remove and dispose of items away from water.
3 Cleanliness	◯ Look for evidence of animal hazards that pose a significant risk (observed animal in canal, fecal deposits or animal carcasses).	◯ Remove animal debris; if animal intrusion is a regular occurrence, investigate the potential cause for intrusion.

Table 2. Sanitary Survey of Distribution System

The following table contains 2 columns. The first one lists potential issues and the second one lists remediation guidelines (how to correct the issue). They are in the incorrect order and do not match. Match the number on the issue to the corresponding remediation guideline accordingly. Discuss the participants' answers with the group. Ask for volunteers to read their answers out loud.

Issue	Remediation Guidelines
1 There are cross-connections in the plumbing system.	◯ Install a back-flow prevention device on every outdoor faucet (available at most hardware and plumbing supply stores).
2 There is not adequate back-flow protection.	◯ When no longer in use, wells must be destroyed to prevent them from functioning as a vertical conduit for contaminants.
3 There are dead-end or unused water lines connected to your plumbing system.	◯ Make sure that your plumbing is not connected to another source of water that may be contaminated (e.g., a defunct community water system).
4 There are abandoned or inactive wells on my property.	◯ Flush lines regularly or remove any unused lines or sections of the water system.

2.3.6 Putting Your Knowledge into Practice – The Company's Water Systems

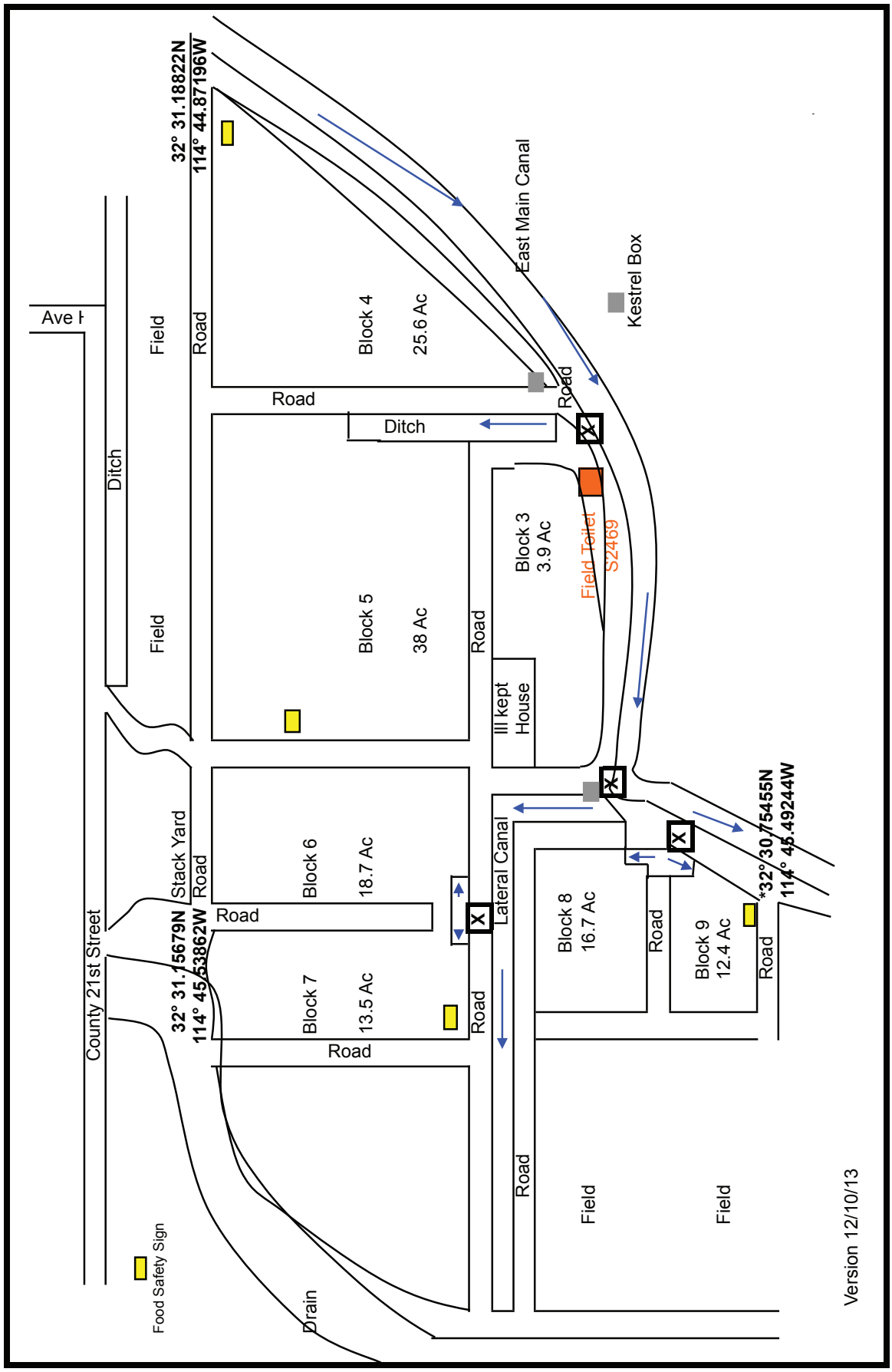
In the picture on the next page you can see a field. Please circle the different water sources and draw the following potential contamination scenarios that we should be aware of during an Environmental Assessment. After each scenario write some of the recommendations or Corrective Actions you would take to mitigate any potential risks.

Scenario # 1. A house indicated on the map is ill-kept. The owner parks vehicles along the lateral canal. Many types of birds raised and kept in cages along the perimeter of block 3. The family dog is frequently seen in crop production areas and is a biter.

Scenario # 2. Construction waste/trash noted north of County 21st along the east side of the Main Canal.

Scenario # 3. The grower farming north of block 5 received several loads of what seems to be compost and the deliveries were made on the field road.

Scenario # 4. Hay bales placed along the perimeter to prevent erosion and sand displacement.


32° 31.18822N
114° 44.87196W
Ave H
Field
Road
Block 4
25.6 Ac
East Main Canal
Kestrel Box
Road
Ditch
Ditch
Field
Block 5
38 Ac
Road
Block 3
3.9 Ac
Field Toilet
S2469
Ill kept
House
Stack Yard
Road
Block 6
18.7 Ac
Road
32° 31.15679N
114° 45.53862W
County 21st Street
Block 7
13.5 Ac
Road
Road
Lateral Canal
Block 8
16.7 Ac
Road
Block 9
12.4 Ac
Road
32° 30.75455N
114° 45.49244W
Road
Field
Field
Food Safety Sign
Drain
Version 12/10/13

2.4 Evidence of Flooding

Flooding is the flowing or overflowing of a field with water, beyond a producer's control, that can contain disease-causing microorganisms. Leafy greens in proximity may be contaminated if there is direct contact between flooding water or contaminated soil and the edible portions of leafy greens. The Food and Drug Administration considers leafy greens in contact with flooding waters to be adulterated.

A field temporarily flooded due to irrigation practices is not considered flooded unless it has a high probability of contributing to microbial contamination. Pooled water (e.g., rainfall), which accumulates from saturation of the field (e.g., not runoff or overflow), is not likely to contain microorganisms of significant public health concern and is not likely to cause adulteration of the edible portion of fresh product. It should not be considered flooding.

If you spot a flooded field that is about to be harvested, contact your Food Safety Professional:

- Buffer and do not harvest any product within 30 ft of the flooding. The flooded area must include a 30-foot or greater buffer space from the highest point of flooding. This is to be assessed by the food safety professional.
- Required buffer distance may be greater than 30 ft based on risk analysis by the company's Food Safety Professional.
- Prevent cross-contamination by cleaning or sanitizing any farm equipment that may have contacted the previously flooded soil.
- If there is evidence of flooding, the production block must undergo a detailed Environmental Assessment by an appropriately trained Food Safety Professional prior to harvest.

2.4.1 Putting Your Knowledge into Practice - Keeping Leafy Greens Safe

Read carefully each of the following situations and explain what the Supervisor overlooked and what Corrective Actions should have been taken. Discuss each situation with the group after they have completed the activity.

1. Michael is a Supervisor working at the fields of The Sun Fresh Co. One morning, while doing the Pre-Harvest Assessment, he notices that a section of the field is flooded and decides to establish a no harvest distance of 25 feet. The harvest begins at 25 feet from the flooding. For some reason, the tractor passes back by this area and runs into the flooded edge of the field and, since nobody noticed, the driver decides to continue until finishing up the field. The Supervisor finds out about the tractor running into the flooded area after the harvest has ended and decides to send the harvested product to the cooler. What was the Supervisor's mistake?

2.4.2 Putting Your Knowledge into Practice – What's Right or Wrong?

Write a short comment on whether or not each of the following food products were grown and/or harvested correctly or what was wrong in each situation.

1. Michael needed to ship 100 boxes of lettuce before 11 AM, so he decided to shorten a no harvest distance from 30 to 20 feet.

2. While driving a tractor, Jose destroys a block that was flooded. Since he was running late, he decides to wash and disinfect the tractor the next day. However, the next day he has a family emergency, does not go to work and forgets to tell his Supervisor about what happened; therefore, the equipment is used to harvest lettuce in a different block.

3. Daniel notices a small flooded area, marks a no harvest distance of 30 feet, and since there are no other incidents, authorizes the harvest to start.

2.4.3 Putting Your Knowledge into Practice – Quiz

Circle the correct answer to each question. There is only 1 right answer per question.

1. What does "field flooding" mean?

a. The overflow of water to a field that a producer cannot control and that might contain disease causing microorganisms.

b. Normal accumulation of water (e.g., after rainfall) in a field that absorbs rapidly into the soil.

c. Temporary accumulation of water in the field due to an irrigation system malfunction.

d. The accumulation of crop residues.

2. Why should a flooded field NOT be harvested?

a. It looks and smells bad.

b. It may cause microbial contamination to produce.

c. It damages the edible portions of produce.

d. It attracts undesirable pests.

3. What is a "buffer" zone in a field?

a. A portion of the crop in the field that can be harvested.

b. A marked section around the potentially contaminated crop area of the crop that you do not harvest.

c. The zone in the field that is flooded.

d. An area in the field covered by water.

2.5 Animal Intrusion

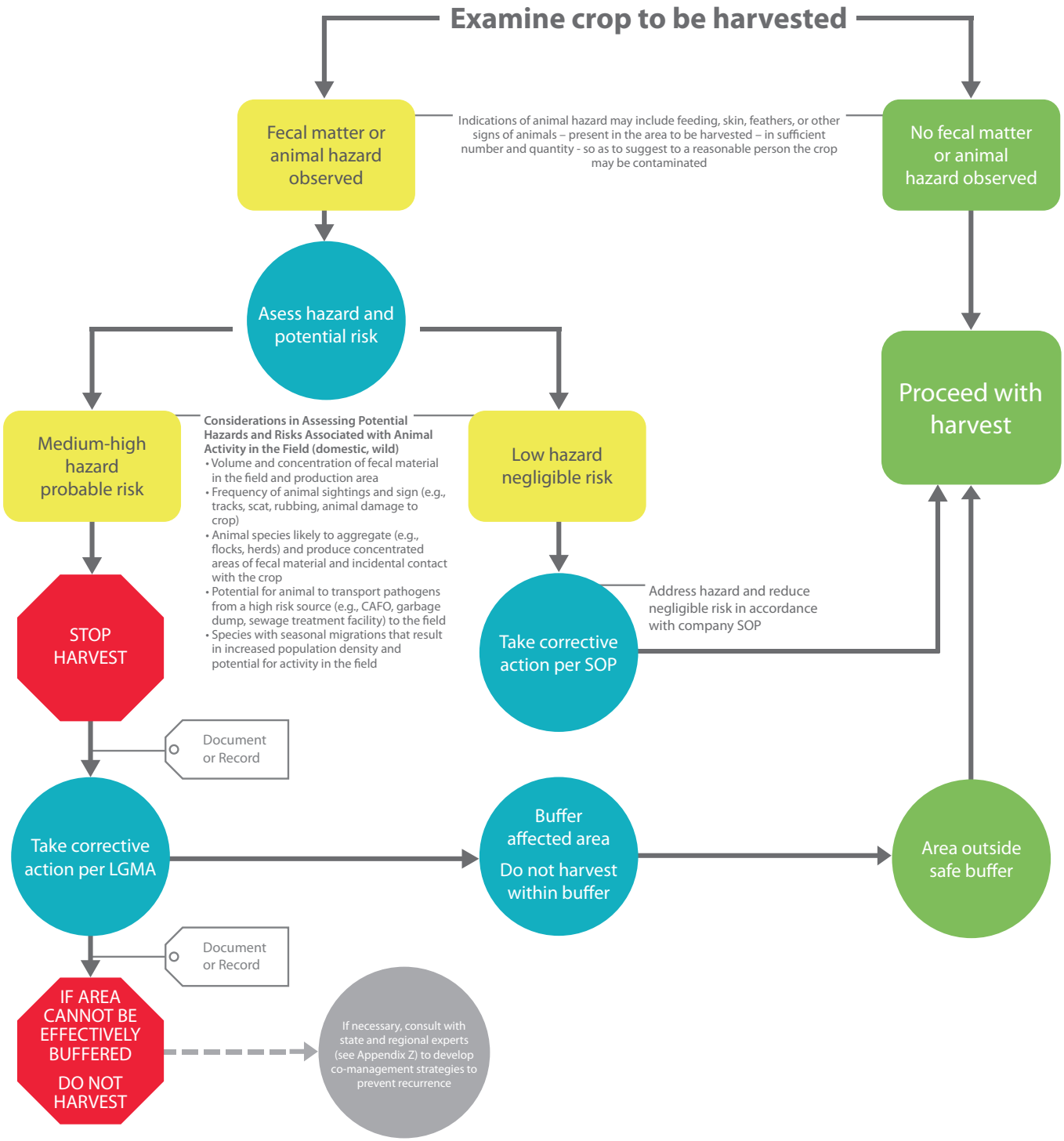
Wild animals, livestock or domestic animals can be carriers of disease causing microorganisms. Leafy greens fields and blocks are susceptible to animal intrusion because leafy greens are generally grown in rural areas that may have adjacent wetlands, wild lands or parks harboring wildlife. Any type of animal in the field may lead to crop contamination, posing a significant risk to leafy greens since contamination can happen through physical contact or fecal matter. However, animal hazards can be categorized in low and medium / high hazards.

During the assessment it is very important to look for any evidence of animal intrusion in the block and to make sure that the field is free of animal intrusion in the block and to make sure that the field is free of animal hazards. Animal hazards are feeding, skin, feathers, fecal matter or signs of animal presence in an area to be harvested in sufficient number and quantity to suggest to a reasonable person the crop may be contaminated.

If evidence of animal intrusion is found in production fields assess the hazard and potential risk. Animal intrusions should be categorized as low or medium / high hazard. An example of a low hazard might be a sign of animal intrusion into the leafy green production area by a single animal or solitary bird with minimal to no fecal deposition. Corrective Actions for "low hazard" animal intrusion shall be carried out according to the company's SOP.

If the animal intrusion is a "medium / high hazard" contact your Food Safety Professional. Corrective Actions for "medium / high hazard" animal intrusion shall be carried out per the accepted LGMA metrics and include food safety buffers and Do Not Harvest areas. Always document your findings and any actions taken.

Review the following flow chart with the participants to help them learn to assess animal hazards in the field. This chart is also available in the Activity Book.



What if fecal material is found in the field?

If you find evidence of fecal matter, which may be a medium / high risk, immediately report it to your Food Safety Professional who will conduct and document a food safety assessment, and suggest a Corrective Action according to your food safety plan.

Harvesting CANNOT begin again until the area is evaluated by your qualified Food Safety Professional and he / she makes sure that the area is clear of contamination.

Do not harvest any product that comes into contact with fecal matter.

Do not harvest any product within a 5 feet radius of contamination and ALWAYS be aware of flagged areas. These represent buffer zones around any animal activity and will help to adequately control or minimize the risk of leafy green contamination.

If evidence of low or medium / high animal hazards in the production block are not discovered until harvest operations begin:

- Stop harvest operations.
- Initiate an intensified block assessment for evidence of further contamination and take appropriate actions as outlined above.
- If evidence of hazards are discovered during harvest, and equipment and/or product is potentially contaminated; clean and sanitize the equipment before resuming harvest operations.
- Require all employees to wash and sanitize their hands/gloves before resuming harvest operations.
- If contamination is discovered in harvest containers such as bins/totes, discard the product, and clean and sanitize the containers before reuse.


STOP
Stop harvesting and call your food safety professional immediately!

2.5.1 Putting Your Knowledge into Practice – Indication of Animal Hazards in the Field

Mark the potential indications of animal hazards in the field with an X.

Skin _____	Pet food _____
Feathers _____	Birds _____
Rotten leafy greens _____	Fecal matter _____
Feeding _____	Signs of broken glass _____
Money _____	A soccer ball _____
Employees eating _____	Clients visiting _____

2.5.2 Putting Your Knowledge into Practice – Identifying Evidence of Animal Intrusion

Mark the situations that may indicate the intrusion of animals to the field with an X.

Fences collapsed _____	Animal tracks _____
Rotten vegetables _____	Unpainted fences _____
Animal feces _____	Residual urine of animals _____
Plants bitten _____	Exposed roots of plants _____
Animal feathers _____	Animal skin/fur _____

2.5.3 Putting Your Knowledge into Practice - Keeping Leafy Greens Safe

Carefully read each of the following case studies. Identify those situations that were overlooked by the Supervisor and state the Corrective Actions that should have been taken. Discuss each situation with the group after they have completed the activity.

1. During the Pre-Harvest Assessment, the employee assessing the field notices that a section of the field fence has fallen down. The assessor takes a call on his cell phone as he starts walking the field. He became so distracted with the phone call that he does not notice that some of the crop had signs of feeding and a high volume of animal fecal matter in the field. He finishes the assessment without a single observation. What was the assessor supposed to do during the inspection? What are the food safety risks involved with animal hazards?

2. A field needs to get harvested today but the Supervisor calls in sick. The harvesting crew starts to work without a proper Pre-Harvesting Assessment. One hour later one worker notices animal footprints on the field but decides not to report it because the substitute Supervisor is checking the hand washing station. The harvesting machine keeps going and passes by a section with animal feces without anyone noticing. What should the worker have done? What are the consequences of not reporting animal feces? What are the food safety risks involved with no reporting?

2.6 Adjacent Land Activity

Leafy greens contaminants may also come from neighboring fields. We take all the necessary measures to minimize risks within our company, but we also need to assess what is going on in the adjacent block of land. The Environmental Assessment should also include a check box for doing so.

Potential contamination sources include, but are not limited to, manure storage, compost storage, concentrated animal feeding operation (CAFO), grazing/open range areas, surface water, sanitary facilities, septic tanks and composting operations.

Some of these sources have been discussed individually, but what if you suddenly get to a field and encounter something unexpected like:

- A pile of soil amendment containing animal manure.
- Untreated manure next to a well head.
- A decayed carcass on the edge of the woods next to your field.
- A septic tank leaking next to the field.
- Run-off or soil leaching.
- A pile of trash and/or debris in an area adjacent to the field that is being inspected.

Be alert and look around during the assessment. If you spot any adjacent land activity that will pose a risk to food safety, do not start harvesting. You should call your Food Safety Professional so that a more comprehensive assessment will be conducted and Corrective Actions can be taken. Your Food Safety Professional will be able to establish the buffer zones outlined in the metrics or decide if the field is suitable for harvesting.

2.6.1 Putting Your Knowledge into Practice - Keeping Leafy Greens Safe

Read carefully and describe what would you do in that scenario.

[Discuss the participants' answers with the group. Ask for volunteers to read their answers out loud.]

1. During the Environmental Assessment what would you do if you see a field next to the lettuce field you are about to start harvesting being composted with soil amendments containing untreated manure?

2. During the assessment what would you do if you see a decayed carcass adjacent to the field you are about to start harvesting?

2.7 Livestock Grazing on Immediately Adjacent Land

Look around! You may not find anything in the field, but there may be risks nearby. Grazing livestock or domestic animals can be another source of contamination. If you find evidence of livestock grazing on land immediately adjacent to the field, you should make sure that they are located a minimum of 30 feet from the edge of the crop or water sources, unless adequate barriers are maintained.

The food safety standards (metrics) we follow suggest this distance. However, this distance may be either increased or decreased depending on risk. The final decision for setting a buffer distance will be made by your Food Safety Professional. The following table can help you make the right decision.

Land Use/Water Source	Metric (This distance may be either increased or decreased depending on risk and mitigation factors.)	Consideration for Risk Analysis		
		Risk/Mitigation Factors	Increase Distance	Decrease Distance
Grazing lands/domestic animals (includes homes with hobby farms, and non-commercial livestock.)	30 ft. from the edge of crop.	Fencing and other physical barriers such as berms, diversion ditches and vegetated strips can be employed to prevent intrusion of domestic animals, control runoff, etc.		X
		Topography: Uphill from crop	X	
		Topography: Downhill from crop		X
		Opportunity for water run off through or from grazing lands	X	
		Opportunity for soil leaching	X	

In summary, fencing and other physical barriers, such as berms, diversion ditches, and vegetated strips, can be employed to prevent intrusion from domestic animals and control run-off.

If grazing is downhill from the crops, the buffer distance may be decreased. However, if grazing is uphill from the crops, there is opportunity for water run-off through or from grazing lands and for soil leaching, so the buffer distance might need to be increased.

2.7.1 Putting Your Knowledge into Practice – Looking for Risks in the Field

Write an **A** (Acceptable) next to the statement if the practice described is acceptable while conducting a food safety Environmental Assessment. Write an **NA** (Not Acceptable) if the situation is not acceptable and poses a food safety risk to leafy greens. Discuss each situation with the group after they have completed the activity.

_____ The Supervisor was conducting the Pre-Harvest Assessment and found a plastic bottle in the field, but notes that a nearby fence is in perfect condition. The field assessor decides to give the OK to start harvesting.

_____ A grazing area is located uphill from the fields; and the Supervisor decides to place a buffer distance of 40 feet.

_____ A grazing area is located downhill from the fields; and the Supervisor decides to place a buffer distance of 20 feet.

_____ A fenced grazing facility is near the harvest areas. The fence is in perfect condition; however, there are animal tracks in the field. Since the fence was in good condition, the Supervisor does not report the incident and gives the OK to start harvesting.

_____ Animal feces are found approximately 10 ft. from unharvested product. The Supervisor does not report the incident and gives the OK to start harvesting.

_____ There is evidence of animals grazing on land immediately adjacent to harvest areas. By measuring the distance between these lands and crop lands, the Supervisor finds that it is 20 feet so he doesn't perform any Corrective Action and gives the OK to start harvesting.

_____ The Supervisor found evidence of animals grazing on the land immediately adjacent to the fields. The grazing areas are 30 feet from the field, fenced, and at the same level as the company's field. The Supervisor doesn't perform any corrective action.

2.7.2 Putting Your Knowledge into Practice – Keeping Leafy Greens Safe

Carefully read the following situations and explain what the Supervisor overlooked and which Corrective Actions should have been taken. Discuss the case study with the group after they have completed the activity.

Fernanda is a food safety assessor. On a Friday morning, while she is doing the Pre-Harvest Assessment, she notices a slight runoff towards the fields coming from a grazing area located uphill. However she decided to dismiss the observation. She assumes the heavy rainfall the night prior was the cause of the runoff. She decides to allow the harvest to begin. A few weeks later a national grocery store recalls 4 bagged salad lots due to contamination with *E. coli*. The traceback investigation led to the leafy greens coming from the field Fernanda inspected on that specific day and time. Fortunately, no one got sick but as a consequence of the recall, the company must pay fines to retailers, exchange product and take a marketing hit. What could have been done in the assessment to prevent this incident?

2.8 Other Potential Sources of Contamination

There are many other sources of contamination to leafy greens in the field. We will review a few contamination sources that you should be aware of during the Environmental Assessments. Do not forget to document your findings in the Environmental Assessment form.

Hand Harvesting Equipment

One way to prevent leafy greens contamination is to keep the hand harvesting equipment, such as knives and coring rings, clean and sanitized. Make sure that all employees ALWAYS use harvesting tools in proper condition.

Harvesting Machines

Harvesting machines can also be a source of contamination. Clean and sanitize them properly to prevent cross-contamination, pay special attention to food contact surfaces. Any farming equipment that comes into contact with raw manure, untreated compost, waters of unknown quality, animal hazards or other potential sources must be cleaned and sanitized following the company procedures. Notify your Food Safety Professional if you spot potential contamination in the harvesting machines.

Containers and Packaging Supplies

When walking the fields, make sure that harvesting containers are used to carry harvested product only. No foreign materials such as soda cans, rocks, nails or clothing can be placed in or on the containers.

It is your job to verify that containers and packaging materials are ALWAYS stored on pallets or truck/trailers, not directly on the ground. Containers and all packaging materials must be inspected before use. Look for loose pieces, pests and pest droppings, damage, trash and debris. If you find anything, report it in your Environmental Assessment form.

Leaks and Spills

Harvesting equipment must be free of fluid leaks or excess grease. If you spot a leak or a spill, stop harvesting and report it immediately to your Food Safety Professional. Any leafy greens that come in contact with dirt, grease or oil must be discarded and documented.

Fecal Material

If you find evidence of fecal matter, report it immediately to your Food Safety Professional. Harvesting CANNOT begin again until the area is evaluated by completing a food safety assessment and cleared of contamination prior to re-start. Do not harvest any product that comes into contact with fecal matter or any product within 5 feet of contamination. Document any fecal material incident in the Environmental Assessment form.

Blood

You and your coworkers must make sure that blood and/or body fluids do not get on any harvested and unharvested product, knives or containers such as boxes or baskets. If blood gets on any leafy greens, these leafy greens should be thrown away immediately. Reusable packing containers must be cleaned and sanitized following the company's blood cleaning policy. Look for cuts on employees' hands or fingers and follow the company's blood and bodily fluids policy.

Glass

Glass or glass containers are not allowed in the field or near the harvesting machine and crews. If you find any broken glass in a leafy greens container, do not just take the piece of glass out; you MUST throw this product away and report it immediately to your Food Safety Professional.

Chemical Contaminants

If you see any chemicals that are not labeled, used incorrectly or not stored properly, note it on your assessment and take an immediate Corrective Action. If you do not know what Corrective Action needs to be applied, contact your Food Safety Professional.

Trash and Waste

Waste and trash are sources of contamination and must be placed in designated containers. These containers should be emptied daily and more often. Do not forget to check trash and waste during your Environmental Assessment.

2.8.1 Putting Your Knowledge into Practice – Looking for Risks in the Field

Contamination in the field may come from unexpected sources. Unlabeled chemical containers are a common finding in the audits. In the assessment you have to make sure you look at all containers to find out if they are properly labeled.

List 5 types of containers commonly found in the field that must be labeled and observed while conducting an Environmental Assessment.

1. _____

2. _____

3. _____

4. _____

5. _____

2.8.2 Putting Your Knowledge into Practice – Keeping Leafy Greens Safe

Read carefully each of the following situations and explain which Corrective Actions should have been taken. These events may lead to product contamination, and they also need to be addressed in the Environmental Assessment. Discuss each case study with the group after they have completed the activity.

1. An experienced Foreman observed an oil spill on the ground near the edge of an unharvested field. The spill was right under a parked tractor. What needs to be done?

2. A disposable product container is being used as a trash can. What needs to be done?

3. Harvesting crew 4579 is using a reusable product container for trash, and another product container is used for storing gloves and packaging materials. What needs to be done?

4. The person conducting the assessment observed two unattached ends of hydraulic lines placed inside plastic bottles for catching leaking fluid. What needs to be done?

Section 3. Mastering Environmental Assessments

The better we do our job with Environmental Assessments, the better we can protect public health and minimize the risk of contaminated leafy greens. The following are some basic recommendations for doing a good job when assessing the fields:

- You may know the fields well; however you must go out and physically WALK the fields you are assessing.
- Do not be overconfident when doing inspections. You must still carefully walk through all fields, visually inspect them, and then record everything in the form, log or checklist you are using. Be prepared, because any ranch may give you a surprise at any given time.
- Pay close attention to the process of filling out the forms, logs and checklists, and when doing so, focus solely on this activity to avoid making mistakes.
- Do not fill records in advance or falsify information.
- Do not cut corners or take shortcuts.
- Your Foremen/Supervisors are a key part of the team; therefore you have to make sure they also follow all the food safety procedures at all times.

3.1 Closing Activity – What did you learn?

Write down 5 important things you have learned in this training that you will apply on a daily basis in your job.

1. _____
2. _____
3. _____
4. _____
5. _____

Remember that you are generating very important information that will help your company to make key decisions. Keep in mind that food safety is a serious matter; if you are in doubt do not hesitate to call your Food Safety Professional. He/she will have the right answers.

This is the end of our discussion about Environmental Assessments. Are there any questions?

Thank you for coming. Please make sure that you have signed the attendance sheet.

Pre-Harvest and Daily Harvest Environmental Assessments Workbook Test

Read each of the questions carefully and pick the best answer. There is only 1 right answer per question.

1. What is an Environmental Assessment?

a. The monitoring of the field conditions.

b. The documented visual monitoring of the field conditions with a focus on potential physical, chemical and biological contaminants.

c. The post harvest evaluation of the field conditions with a focus on potential physical, chemical and biological contaminants.

d. The monitoring of the field conditions with a focus on potential physical, chemical and biological contaminants.

2. Which of the following findings should be reported in your Environmental Assessment checklist?

a. Animal intrusion in the field.

b. Flooding in the field.

c. Employee's bad personal hygiene practices.

d. All of the above.

3. An employee is spotted not washing his hands after using the restroom. What should you do in this situation?

a. Ignore the situation.

b. Ask the employee to wash their hands appropriately.

c. Take note of the employee and see if it happens again.

d. Ask the employee to wear gloves to protect the product.

4. There are many good documenting practices that must be followed while filling out forms, logs or checklists. Which of the following statements is NOT a good documenting practice?

a. The information the Food Safety Professional provides in the checklist is correct and accurate.

b. The Food Safety Professional uses permanent ink and no white out is used on the forms.

c. If the field assessor has any questions, he calls the Food Safety Professional immediately.

d. The Food Safety Professional fills out the forms, logs or checklists in advance.

5. What do you do if fecal material is found in the field?

a. Ignore it and start harvesting.

b. Clean the area and start harvesting.

c. Set up a buffer zone within 5 feet of the contamination source.

d. Set up a buffer zone within 1 foot of the contamination source.

6. Which statement is TRUE about "Corrective Actions"?

a. It is defined as a change or an improvement made in the field to address a deficiency or to eliminate causes of non-conformities or other undesirable situations in the fields that may pose a food safety risk to leafy greens.

b. Corrective Actions can be taken by any employee on the field without informing the company's Food Safety Professional.

c. They are optional and it is not necessary to take them when a deficiency or a cause of non-conformity is found on the field.

d. If a Corrective Action needs to be implemented the Food Safety Professional/Personnel does not have to document it.

7. When can chemicals used in the operation become contaminants?

a. When they are labeled correctly.

b. When they are used incorrectly or not following the manufacturer's instructions.

c. When they are stored in the proper containers or areas.

d. All of the above.

8. When is the "Pre-Harvest Environmental Assessment" conducted?

a. Two weeks before harvesting.

b. The day before harvesting.

c. One to seven days before harvesting.

d. Each day of harvest before harvesting begins in that specific block.

9. Which of the following are considered evidences of animal intrusion?

a. Feces or urine.

b. Bitten plants or exposed roots of plants.

c. Feathers, skin or fur.

d. All of the above.

10. What does "field flooding" mean?

a. The overflow of water to a field that a producer cannot control and that might contain disease causing microorganisms.

b. Normal accumulation of water (e.g., after rainfall) in a field that absorbs rapidly into the soil.

c. Temporary accumulation of water in the field due to an irrigation system malfunction.

d. The accumulation of crop residues.

11. When inspecting Field Sanitary Facilities which of the following points should you check for?

a. Number of facilities and location.

b. Cleanliness and supplies.

c. Documentation (daily cleaning and servicing, signage.)

d. All of the above.

12. What is a "buffer" zone in a field?

a. A portion of the crop in the field that can be harvested.

b. A marked section around the potentially contaminated crop area of the crop that you do not harvest.

c. The zone in the field that is flooded.

d. An area in the field covered by water.

13. What should you do if you spot a leak or a spill in a harvesting machine?

a. Stop harvesting and report it immediately to your company's Food Safety Professional.

b. Document it and continue harvesting.

c. Clean the spill and continue harvesting.

d. All of the above.

14. Which of the following items can contaminate harvesting machines?

a. Raw manure.

b. Untreated compost.

c. Waters of unknown quality.

d. All of the above.

15. When is the "Daily Harvest Assessment" conducted?

a. Two weeks before harvesting.

b. The day before harvesting.

c. One to seven days before harvesting.

d. Each day of harvest before harvesting begins in that specific block.

Glossary

Adjacent Land

Neighboring fields, land or property that has a common endpoint or border. The adjacent land may not be physically separated.

Adulterated

Adulterated food is food that is generally, impure, unsafe, or unwholesome. "Adulteration" is a legal term meaning that a food product fails to meet federal or state standards.

Air Gap

Air gaps are non-mechanical backflow preventers that are very effective devices to be used where either backsiphonage or backpressure conditions may exist. It is the unobstructed vertical space between the water outlet and the flood level of a fixture

Animal Hazard

Feeding, skin, feathers, fecal matter or signs of animal presence in an area to be harvested in sufficient number and quantity to suggest to a reasonable person the crop may be contaminated.

Backflow

Backflow is the undesirable reversal of flow of non-potable water or other substances through a cross-connection and into the piping of a public water system or consumer's potable water system.

Biological Contaminant

Biological contaminants are pathogenic microorganisms that can make people sick if the leafy greens become contaminated by accident or due to poor practices during harvesting, coring, sorting, handling, packing or storing. (i.e. *Salmonella* spp., *E. coli* O157:H7, *Listeria monocytogenes* among others.)

Buffer

It is a protective separation zone from or around, a potentially contaminated area.

Chemical Contaminant

A harmful chemical compound that comes into contact with leafy greens. (i.e. pesticides, cleaning compounds, sanitizing products, and machine oils and lubricants.)

Concentrated Animal Feeding Operation (CAFO)

These are agricultural operations where animals are kept and raised in confined situations. A lot or facility where animals have been, are or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12 month period and crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. Feed is brought to the animals rather than the animals grazing or otherwise seeking feed in pastures, fields, or on rangeland.

Corrective Actions

It is a change or an improvement made in the field to address a deficiency or to eliminate causes of non-conformities or other undesirable situations in the fields that may pose a food safety risk to product.

Cross-Connection

An actual or potential connection between a potable water supply or water of known quality and a non-potable source.

Cross-Contamination

The transfer of microorganisms, such as bacteria and viruses, from one place to another.

Daily Harvest Assessment

Assessment done each day of the harvest before starting to harvest in that specific block and/or lot that has been scheduled for harvest.

Flooding

The flowing or overflowing of a field with water outside a producer's control that is reasonably likely to contain microorganisms of significant public health concern and is reasonably likely to cause adulteration of edible portions of fresh produce in that field.

Foodborne Outbreak

A foodborne illness outbreak occurs when two or more people become sick from eating the same contaminated food.

Food Contact Surface

Any surface or area that may come in direct contact with exposed leafy greens. Examples would include conveyor belts, table tops, cutting tools, augers, baskets, totes, bins, gloves, aprons, among others.

Food Safety Personnel

Person trained in basic food safety principles and/or working under the auspices of a food safety professional.

Food Safety Professional

Person entrusted with management level responsibility for conducting food safety assessments before food reaches consumers; requires documented training in scientific principles and a solid understanding of the principles of food safety as applied to agricultural production.

Forms, Logs or Checklists

Established operational documents that help ensure that specific food safety tasks are completed and specific information collected.

Harvest Equipment

Any equipment that enters the field and may travel over unharvested product. Some examples include tractors and trailers.

Hand Harvesting Equipment

Manual tools used by employees to harvest leafy greens by hand. These tools include but are not limited to knives and coring rings.

Harvesting Machines

Automatic machines used to harvest, collect and transport leafy greens.

Hobby Farm

A small farm, or rural residence with 25 or fewer animals per acre that is operated without expectation of being the primary source of income.

Leafy Greens

Iceberg lettuce, romaine lettuce, green leaf lettuce, red leaf lettuce, butter lettuce, baby leaf lettuce (i.e., immature lettuce or other leafy greens), escarole, endive, spring mix, spinach, cabbage (green, red and savoy), kale, arugula, radicchio and chard.

Leaks

Any fluid or liquid accidentally emanating through a hole, crack, or connection from a piece of machinery, hose, tank or container. These can include oil, grease, gasoline, contaminated water or other chemical contaminants.

No Harvest Zone

A zone in or around a field that cannot be harvested.

Pathogen

A disease causing agent such as a virus, parasite, or bacteria.

Pooled Water

An accumulation of standing water; not free-flowing.

Physical Contaminant

A physical contaminant is a soft or hard foreign material that may be incorporated into the harvest leafy greens either by accident or due to poor handling or practices during harvesting, transportation, packing or storing. (I.e. nails & clips, hair, pencils & pens, broken glass, money, cigarettes and candy wrappers)

Pre-Harvest Assessment

A food safety assessment done within the week prior to harvesting. It can be conducted 1 to 7 days before harvesting.

Public Health

Public health refers to all organized measures to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases. Thus, public health is concerned with the total system and not only the eradication of a particular disease.

Risk Mitigation

Actions to reduce the severity/impact of a risk.

Water Distribution System

Any system consisting of pipes, pumps, valves, storage tanks, reservoirs, meters, fittings, gates and other hydraulic appurtenances – canals, ditches, laterals, and rivers -- to carry water from its primary source to a lettuce and leafy green crop.