4.0 Water **(Answers G-3, 1-1 - 1-5, 2-15)**

Purpose:
To ensure water used in the field for irrigation, frost protection, or as a carrier for pesticides and fertilizers is of adequate quality for agricultural uses and is free of microbial and chemical risks. To ensure that water available for workers for drinking and hand washing is potable.

Concern:
Water is a vehicle by which pathogens that are associated with food-borne illnesses (such as pathogenic *E. coli* and *Salmonella*) and can contaminate produce.

Contaminant Introduction
- Chemicals or amendments that could pose a risk.
- Harmful pathogens that can cause food-borne illness from either point or non-point sources.

Policies and Procedures:
List what you are doing to protect your water sources from contamination and describe your water testing procedures and frequencies. These are some sample policies.

Water source for irrigation is from pond, stream, well, municipal, or other specified for fields field designated numbers. Crops are irrigated by overhead, drip, other specified for fields field designated numbers. Frost protection is accomplished by overhead or other specified for fields field designated numbers.

Potable water used for drinking, hand washing, and postharvest activities is from pond, stream, well, municipal, or other specified.

Water testing results for these sources are available in Appendix 4.1 - Water Sampling Monitoring Log.

1. Water used for irrigation, spraying, mixing pesticides, and frost protection that comes in direct contact with plants will meet foliar-application water standards. A test documenting that the water source is potable will be kept on record in Appendix 4.1 for at least two years.
2. Water sources will be inspected for possible contamination daily and results recorded on the Field Supervisors Daily Checklist (Appendix 3.3). If potential contamination is found, a Notice of Unusual Events/Problems and Corrective Measures (Appendix 1.3) will be completed.
3. Water sources (wells, ponds, surface waters) will be protected from runoff, leaching, spillage, drift to water sources, and livestock or wildlife by constructing necessary measures (diversion berms, runoff control structures, vegetative buffers) to limit fecal and regulated or non-regulated contaminants.

4. Control measures like backflow prevention devices, check valves, and air-gaps in the water distribution system will be installed to prevent regulated (pesticides and non-regulated materials (fertilizers) from contaminating water sources.
5. Sound conservation practices, such as a vegetative buffer, will limit the potential of point and non-point source contaminants.
6. Portable restroom and hand-washing facilities will be located so as to reduce the risk of water contamination from spills.
7. Water sources and irrigation methods that reduce contact between non-potable water and edible portions of produce (drip irrigation) will be used when applicable.
8. Identification of all upstream uses of surface water and any potential sources of contamination will be identified using the Land Use History and Prevention Measures document (Appendix 1.2).
9. Irrigation water will be sampled for quality at the water source at the beginning of the growing season and then quarterly until harvest. Records for all tests will be maintained in Appendix 4.1). Water testing sites will be based on the location of point and non-point sources and additional tributaries coming into the main water sources.
10. Field water samples will be collected from the water sources (and distribution systems) no more than 60 days before the beginning of each production season and continue on a scheduled basis according to the degree of risk associated with the water source:
    a. Municipal water source – one annual test
    b. Wells - one annual test
    c. Surface waters/ponds – tested each month during production season
11. Microbial testing of water samples will be a quantitative analysis for generic E.coli using the Clean Water Act of 1972 Bacterial Water Quality Standards for Recreational Waters (Freshwater and Marine Waters) and the Leafy Greens Marketing Agreement Guidance:
    a. Non-foliar application of water: Water with ≤ 126 MPN geometric mean of 5 samples and < 576/ 100 mL for all single samples.
    b. Foliar application of water: Water ≤ 126 MPN geometric mean of 5 samples and <235/ 100 mL for all single samples.

Corrective Measures:
If generic *E.coli* test samples show unacceptable amounts, the following steps will be taken:

- Stop irrigation.
- Stop harvesting.
- Identify the source of contamination and determine remediation actions (flush systems, chlorinate).
- Dispose of any adulterated product in accordance with the FDA's disposal policy (via landfill or incineration) (http://www.fsis.usda.gov/PDF/Disposal_Decontamination_Guidelines.PDF)
- Resample water sources and individual distribution systems if necessary until acceptable criteria have been reinitiated.
- Resume production activities once acceptable criteria are met.

Other possible mitigation measures:

- Wells
  - shock the well with chlorine.
  - repair casing
  - find an alternative water source (For water sources that are contaminated and no alternative water supplies are available, an automatic chlorination system is a possible mitigation measure.)