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PART 1

CABINET FOR HEALTH AND FAMILY SERVICES DIVISION OF PUBLIC HEALTH AND SAFETY

902 KAR 50:110. Grade A milk and milk products standards.

RELATES TO: KRS 217C.010-217C.990

STATUTORY AUTHORITY: KRS 194A.050, 211.090, 217C.040, 217C.040, EO 2004-726

NECESSITY, FUNCTION, AND CONFORMITY: EO 2004-726, effective July 9, 2004, reorganized the Cabinet for Health and Family Services and placed the Department for Public Health under the Cabinet for Health and Family Services. KRS 217C.040 requires the cabinet to promulgate administrative regulations concerning the production, transportation, processing, handling, sampling, examination, grading, sale and such other matters relating to Grade A milk and milk products as may be necessary to protect the public health. This administrative regulation establishes uniform permit requirements and sanitary standards for Grade A milk producers, processors, handlers and distributors, Grade A dry and condensed milk, Grade A dry and condensed whey and the fabrication of single-service containers and closures for milk and milk products.

Section 1. Grade A Milk and Milk Products. The permit requirements, sanitary and quality requirements for the production, processing, handling and distribution of Grade A milk and milk products shall be the same as the requirements established in the publication entitled, "Grade A Pasteurized Milk Ordinance," 2003 recommendations of the United States Public Health Service/Food and Drug Administration.

Section 2. Incorporation by Reference. (1) "Grade A Pasteurized Milk Ordinance," (2005 edition) is incorporated by reference.

(a) "Grade A Pasteurized Milk Ordinance", (2005 edition).

(2) This material may be inspected, copied, or obtained, subject to applicable copyright law, at the Office of the Commissioner, Department for Health Services, 275 East Main Street, Frankfort, Kentucky 40621, Monday through Friday, 8 a.m. to 4:30 p.m.

(3) Copies are also available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (11 Ky.R. 115; eff. 8-7-84; Am. 12 Ky.R. 1918; eff. 7-2-86; 18 Ky.R. 1469; eff. 1-10-92; 29 Ky.R. 2773; 30 Ky.R. 288; eff. 8-13-2003; 31 Ky.R. 632; 946; eff. 11-17-2003; 31 Ky.R. 632; 946; eff. 11-17-2004.)

PART 11

SECTION 1. DEFINITIONS

Terms used in this document, not specifically defined herein, are those within Title 21, Code of Federal Regulations (CFR) and/or the Federal Food, Drug, and Cosmetic Act (FFD&CA) as amended.

The following additional definitions shall apply in the interpretation and the enforcement of this Ordinance:

A. ABNORMALITIES OF MILK:

1. A-1. Abnormal Milk: Milk that is visibly changed in color, odor and/or texture.
2. A-2. Undesirable Milk: Milk that, prior to the milking of the animal, is known to be unsuitable for sale, such as colostrums.
3. A-3. Contaminated Milk: Milk that is un-saleable or unfit for human consumption following treatment of the animal with veterinary products, i.e. antibiotics, which have withhold requirements, or treatment with medicines or insecticides not approved for use on dairy animals by FDA or the Environmental Protection Agency (EPA).

B. ASEPTIC PROCESSING: The term "Aseptic Processing", when used to describe a milk product, means that the product has been subjected to sufficient heat processing and packaged in a hermetically sealed container, to conform to the applicable requirements of 21 CFR 113 (Refer to the Reference in Appendix L.) and the provisions of Section 7, Item 16p of this Ordinance, and to maintain the commercial sterility of the product under normal non-refrigerated conditions.

C. AUTOMATIC MILKING INSTALLATION (AMI): The term automatic milking installation covers the entire installation of one (1) or more automatic milking units, including the hardware and software utilized in the operation of individual automatic milking units, the animal selection system, the automatic milking machine, the milk cooling system, the system for cleaning and sanitizing the automatic milking unit, the teat cleaning system, and the alarm systems associated with the process of milking, cooling, cleaning and sanitation.

D. BULK MILK HAULER/SAMPLER: A bulk milk hauler/sampler is any person who collects official samples and may transport raw milk from a farm and/or raw milk products to or from a milk plant, receiving station or transfer station and has in their possession a permit from any State to sample such products.

E. BULK MILK PICKUP TANKER: A bulk milk pickup tanker is a vehicle, including the truck, tank and those appurtenances necessary for its use, used by a bulk milk hauler/sampler to transport bulk raw milk for pasteurization from a dairy farm to a milk plant, receiving station, or transfer station.

F. BUTTERMILK: Buttermilk is a fluid product resulting from the manufacture of butter from milk or cream. It contains not less than 8¼ percent of milk solids not fat.

1. F-1. Grade "A" Dry Buttermilk: Grade "A" dry buttermilk means dry buttermilk, which complies with the applicable provisions of this Ordinance.
2. F-2. Grade "A" Dry Buttermilk Products: Grade "A" dry buttermilk products means dry buttermilk products, which complies with the applicable provisions of this Ordinance.
3. F-3. Concentrated (Condensed) Buttermilk: Concentrated (condensed) buttermilk is the product resulting from the removal of a considerable portion of water from buttermilk.

4. F-4. Grade "A" Concentrated (Condensed) and Dry Buttermilk and Buttermilk Products: Grade "A" concentrated (condensed) and dry buttermilk and buttermilk products means concentrated (condensed) or dry buttermilk and buttermilk products, which comply with the applicable provisions of this Ordinance. The words "concentrated (condensed) and dry milk products" shall be interpreted to include concentrated (condensed) and dry buttermilk and buttermilk products.
- G. CLEAN: Direct product contact surfaces that have had the effective and thorough removal of product and/or contaminants.
- H. COMMON NAME: The generic term commonly used for domestic animals, i.e., cattle, goats, sheep, horses, water buffalo, etc. (Refer to the last.)
- I. CONCENTRATED (CONDENSED) MILK: Concentrated (condensed) milk is a fluid product, unsterilized and unsweetened, resulting from the removal of a considerable portion of the water from the milk, which when combined with potable water in accordance with instructions printed on the container label, results in a product conforming with the milk fat and milk solids not fat levels of milk as defined in this Section.
1. I-1. Concentrated (Condensed) Milk Products: Concentrated (condensed) milk products shall be taken to mean and to include homogenized concentrated (condensed) milk, concentrated (condensed) skim milk, concentrated (condensed) reduced fat or low fat milk, and similar concentrated (condensed) products made from concentrated (condensed) milk or concentrated (condensed) skim milk, which when combined with potable water in accordance with instructions printed on the container label, conform with the definitions of the corresponding milk products in this Section.
 2. I-2. Grade "A" Concentrated (Condensed) Skim Milk: Grade "A" concentrated (condensed) skim milk means concentrated (condensed) skim milk, which complies with the applicable provisions of this Ordinance.
- J. COOLING POND: A cooling pond is a man-made structure designed for the specific purpose of cooling cows.
- K. DAIRY FARM: A dairy farm is any place or premises where one (1) or more lactating animals (cows, goats, sheep, water buffalo, or other hooved mammal) are kept for milking purposes, and from which a part or all of the milk or milk product(s) is provided, sold or offered for sale to a milk plant, receiving station or transfer station. (Refer to the [last NOTE: in Section 6.](#))
- L. DAIRY PLANT SAMPLER: A person responsible for the collection of official samples for regulatory purposes outlined in Section 6 of this Ordinance. This person is an employee of the Regulatory Agency and is evaluated at least once every two (2)-year period by a State Sampling Surveillance Officer.
- M. EGGNOG OR BOILED CUSTARD: Eggnog or boiled custard is the product defined in 21 CFR 131.170.
- N. FOOD ALLERGENS: Are proteins in foods that are capable of inducing an allergic reaction or response in some individuals. There is scientific consensus that the following foods account for more than 90% of all food allergies: peanuts, soybeans, milk, eggs, fish, crustaceans, tree nuts, and wheat.

Reference: FDA Compliance Policy Guide 555.250 - Statement of Policy for Labeling and Preventing Cross-Contact of Common Food Allergens available on the Internet at: http://www.fda.gov/ora/compliance_ref/cpg/cpgfod/cpg555-250.htm

- O. **FROZEN MILK CONCENTRATE:** Frozen milk concentrate is a frozen milk product with a composition of milk fat and milk solids not fat in such proportions that when a given volume of concentrate is mixed with a given volume of water the reconstituted product conforms to the milk fat and milk solids not fat requirements of whole milk. In the manufacturing process, water may be used to adjust the primary concentrate to the final desired concentration. The adjusted primary concentrate is pasteurized, packaged, and immediately frozen. This product is stored, transported and sold in the frozen state.
- P. **GOAT MILK:** Goat milk is the normal lacteal secretion, practically free of colostrums, obtained by the complete milking of one (1) or more healthy goats. Goat milk sold in retail packages shall contain not less than 2½ percent milk fat and not less than 7½ percent milk solids not fat. Goat milk shall be produced according to the sanitary standards of this Ordinance. The word "milk" shall be interpreted to include goat milk.
- Q. **HACCP DEFINITIONS:** (For use in conjunction with Appendix K.)
1. Q-1. **AUDIT:** An evaluation of the entire milk plant, receiving station or transfer station facility and NCIMS HACCP System to ensure compliance with the NCIMS HACCP System and other NCIMS regulatory requirements.
 2. Q-2. **CENTRALIZED DEVIATION LOG:** A centralized log or file identifying data detailing any deviation of critical limits and the corrective actions taken as required in Appendix K.
 3. Q-3. **CONTROL:**
 1. To manage the conditions of an operation to maintain compliance with established criteria.
 2. The state where correct procedures are being followed and criteria are being met.
 4. Q-4. **CONTROL MEASURE:** Any action or activity that can be used to prevent, eliminate, or reduce a significant hazard that is managed at a Critical Control Point.
 5. Q-5. **CORRECTIVE ACTION:** Procedures followed when a deviation occurs.
 6. Q-6. **CRITICAL CONTROL POINT (CCP):** A step at which control can be applied and is essential to prevent or eliminate a milk or milk product safety hazard or reduce it to an acceptable level.
 7. Q-7. **CRITICAL ELEMENT (CL):** A maximum and/or minimum value to which a biological, chemical, or physical parameter must be controlled at a CCP to prevent, eliminate, or reduce to an acceptable level the occurrence of a milk or milk product safety hazard.
 8. Q-8. **CRITICAL LISTING ELEMENT (CLE):** An item on the MILK PLANT, RECEIVING STATION OR TRANSFER STATION NCIMS HACCP SYSTEM AUDIT REPORT identified with a double star (**). The marking of a CLE by a State Rating Officer or FDA auditor, indicates a condition that constitutes a major dysfunction likely to result in a potential compromise to milk or milk product safety, or that violate NCIMS requirements regarding drug residue testing and trace back or raw milk sources, whereby a listing may be denied or withdrawn.
 9. Q-9. **DAIRY HACCP CORE CURRICULUM:** the core curriculum consists of:
 1. Basic HACCP training; plus
 2. An orientation to the requirements of the NCIMS HACCP Program.

10. Q-10. DEFICIENCY: An element inadequate or missing from the requirements of the HACCP System or Appendix K.
 11. Q-11. DEVIATION: A failure to meet a CL.
 12. Q-12. HAZARD ANALYSIS CRITICAL CONTROL POINT (HACCP): A systematic approach to the identification, evaluation, and control of significant milk or milk product safety hazards.
 13. Q-13. HACCP PLAN: The written document, which is based upon the principles of HACCP and delineates the procedures to be followed.
 14. Q-14. HACCP SYSTEM: The implemented HACCP Plan and Prerequisite Program, including other applicable NCIMS requirements.
 15. Q-15. HACCP TEAM: The group of people who are responsible for developing, implementing, and maintaining the HACCP System.
 16. Q-16. HAZARD: A biological, chemical, or physical agent that is reasonably likely to cause illness or injury in the absence of its control.
 17. Q-17. HAZARD ANALYSIS: The process of collecting and evaluating information on hazards associated with the milk under consideration, to decide which are reasonably likely to occur and must be addressed in the HACCP Plan.
 18. Q-18. MONITOR: To conduct a planned sequence of observations or measurements to assess whether a CCP is under control or to assess the conditions and practices of all required Prerequisite Programs.
 19. Q-19. NON-CONFORMITY: A failure to meet specified requirements of the HACCP System as described in Appendix K.
 20. Q-20. POTENTIAL HAZARD: Any hazard to be evaluated by the hazard analysis.
 21. Q-21. PREREQUISITE PROGRAMS (PPs): Procedures, including Good Manufacturing Practices (GMPs), which address operational conditions that provide the foundation for the HACCP System. The required PPs specified in Appendix K. are sometimes called Sanitary Standard Operating Procedures (SSOPs) in other HACCP Systems.
 22. Q-22. VALIDATION: The element of verification focused on collecting and evaluating scientific and technical information to determine whether the HACCP Plan, when properly implemented, will effectively control the hazards.
 23. Q-23. VERIFICATION: Those activities, other than monitoring, that determine the validity of the HACCP Plan and that the HACCP System is operating according to the plan.
- R. HOOVED MAMMALS MILK: Hooved mammal's milk is the normal lacteal secretion, practically free of colostrums, obtained by the complete milking of one (1) or more healthy hooved mammals. This product shall be produced according to the sanitary standards of this Ordinance. (Refer to the [last NOTE: in Section 6.](#))
- S. INDUSTRY PLANT SAMPLER: A person responsible for the collection of official samples for regulatory purposes at a milk plant, receiving station or transfer station as outlined in Appendix N. This person is an employee of the milk plant, receiving station or transfer station and is evaluated at least once every two (2) year period by a State Sampling Surveillance Officer or a properly delegated Sampling Surveillance Regulatory Official.

- T. MILK DISTRIBUTOR: A milk distributor is any person who offers for sale or sells to any milk or milk products.
- U. MILK PLANT: A milk plant is any place, premises; or establishment where milk or milk products are collected, handled, processed, stored, pasteurized, ultra-pasteurized, aseptically processed, condensed, dried, packaged, or prepared for distribution.
- V. MILK PRODUCER: A milk producer is any person who operates a dairy farm and provides, sells or offers milk for sale to a milk plant, receiving station or transfer station.
- W. MILK PRODUCTS: Milk products include cream, light cream, light whipping cream, heavy cream, heavy whipping cream, whipped cream, whipped light cream, sour cream, acidified sour cream, cultured sour cream, half-and-half, sour half-and-half, acidified sour half-and-half, cultured sour half-and-half, reconstituted or recombined milk and milk products, concentrated (condensed) milk, concentrated (condensed) milk products, concentrated (condensed) and dry milk products, nonfat (skim) milk, reduced fat or low fat milk, frozen milk concentrate, eggnog, buttermilk, buttermilk products, whey, whey products, cultured milk, cultured reduced fat or low fat milk, cultured nonfat (skim) milk, yogurt, low fat yogurt, nonfat yogurt, acidified milk, acidified reduced fat or low fat milk, acidified nonfat (skim) milk, low-sodium milk, low-sodium reduced fat or low fat milk, low-sodium nonfat (skim) milk, lactose-reduced milk, lactose-reduced reduced fat or low fat milk, lactose-reduced nonfat (skim) milk, aseptically processed and packaged milk and milk products as defined in this Section, milk, reduced fat, low fat milk or nonfat (skim) milk with added safe and suitable microbial organisms and any other milk product made by the addition or subtraction of milk fat or addition of safe and suitable optional ingredients for protein, vitamin or mineral fortification of milk products defined herein.^{2,3}

Milk products also include those dairy foods made by modifying the federally standardized products listed in this Section in accordance with 21 CFR 130.10-Requirements for foods named by use of a nutrient content claim and a standardized term.

This Definition shall include those milk and milk products, as defined herein, which have been aseptically processed and then packaged.

Milk and milk products which have been retort processed after packaging or which have been concentrated (condensed) or dried are included in this Definition only if they are used as an ingredient to produce any milk or milk product defined herein or if they are labeled as Grade "A" as described in Section 4.

Powdered dairy blends may be labeled Grade "A" and used as ingredients in Grade "A" dairy products, such as cottage cheese dressing mixes or starter media for cultures used to produce various Grade "A" cultured products, if they meet the requirements of this Ordinance. If used as an ingredient in Grade "A" products, such as those listed above, blends of dairy powders must be blended under conditions, which meet all applicable Grade "A" requirements. Grade "A" powder blends must be made from Grade "A" powdered dairy products, except that small amounts of functional ingredients, (total of all such ingredients shall not exceed 5% by weight of the finished blend) which are not Grade "A" are allowed in Grade "A" blends when the finished ingredient is not available in Grade "A" form, i.e., sodium caseinate. This is similar to the existing FDA position that such dairy ingredient in small cans of freeze-dried starter culture need not be Grade "A".

This definition is not intended to include dietary products (except as defined herein), infant formula, ice cream or other frozen desserts, butter or cheese.

1. W-1. Dry Milk Products: Dry milk products mean products resulting from the drying of milk or milk products and any product resulting from the combination of dry milk products with other wholesome dry ingredients.
 2. W-2. Grade "A" Dry Milk Products: Grade "A" dry milk products mean dry milk products, which comply with the applicable provisions of this Ordinance.
- X. MILK TANK TRUCK: A milk tank truck is the term used to describe both a bulk milk pickup tanker and a milk transport tank.
- Y. MILK TANK TRUCK CLEANING FACILITY: Any place, premises, or establishment, separate from a milk plant, receiving station or transfer station, where a milk tank truck is cleaned and sanitized.
- Z. MILK TANK TRUCK DRIVER: A milk tank truck driver is any person who transports raw or pasteurized milk or milk products to or from a milk plant, receiving station or transfer station. Any transportation of a direct farm pickup requires the milk tank truck driver to have responsibility for accompanying official samples.
- AA. MILK TRANSPORT TANK: A milk transport tank is a vehicle, including the truck and tank, used by a bulk milk hauler/sampler to transport bulk shipments of milk and milk products, from a milk plant, receiving station or transfer station to another milk plant, receiving station or transfer station.
- BB. MILK TRANSPORTATION COMPANY: A milk transportation company is the person responsible for a milk tank truck (s).
- CC. OFFICIAL LABORATORY: An official laboratory is a biological, chemical or physical laboratory, which is under the direct supervision of the Regulatory Agency.
- DD. OFFICIALLY DESIGNATED LABORATORY: An officially designated laboratory is a commercial laboratory authorized to do official work by the Regulatory Agency, or a milk industry laboratory officially designated by the Regulatory Agency for the examination of producer samples of Grade "A" raw milk for pasteurization and commingled milk tank truck samples of raw milk for drug residues and bacterial limits.
- EE. PASTEURIZATION: The terms "pasteurization", "pasteurized" and similar terms shall mean the process of heating every particle of milk or milk product, in properly designed and operated equipment, to one (1) of the temperatures given in the following chart and held continuously at or above that temperature for at least the corresponding specified time:

Temperature	Time
63°C (145°F)*	30 minutes
72°C (161°F)*	15 seconds
89°C (191°F)	1.0 second
90°C (194°F)	0.5 seconds
94°C (201°F)	0.1 seconds
96°C (204°F)	0.05 seconds
100°C (212°F)	0.01 seconds

FF. *If the fat content of the milk product is ten percent (10%) or more, or if it contains added sweeteners, or if it is concentrated (condensed), the specified temperature shall be increased by

3°C (5°F).

GG. Provided, that eggnog shall be heated to at least the following temperature and time specifications:

Temperature	Time
69°C (155°F)	30 minutes
80°C (175°F)	25 seconds
83°C (180°F)	15 seconds

HH. Provided further, that nothing shall be construed as barring any other pasteurization process, which has been recognized by FDA to be equally efficient and which is approved by the Regulatory Agency.

II. PERSON: The word "person" shall include any individual, milk plant operator, partnership, corporation, company, firm, trustee, association or institution.

JJ. RECEIVING STATION: A receiving station is any place, premises, or establishment where raw milk is received, collected, handled, stored, or cooled and prepared for further transporting.

KK. RECONSTITUTED OR RECOMBINED MILK AND/OR MILK PRODUCTS: Reconstituted or recombined milk and/or milk products shall mean milk or milk products defined in this Section which result from reconstituting or recombining of milk constituents with potable water when appropriate.⁴

LL. REGULATORY AGENCY: The Regulatory Agency shall mean the ... of the ...¹ or their authorized representative. The term, "Regulatory Agency", whenever it appears in the Ordinance shall mean the appropriate agency having jurisdiction and control over the matters embraced within this Ordinance.

MM. SANITIZATION: Is the application of any effective method or substance to properly cleaned surfaces for the destruction of pathogens, and other microorganisms, as far as is practicable. Such treatment shall not adversely affect the equipment, the milk and/or milk product, or the health of consumers, and shall be acceptable to the Regulatory Agency.

NN. SHEEP MILK: Sheep milk is the normal lacteal secretion practically free of colostrums, obtained by the complete milking of one (1) or more healthy sheep. Sheep milk shall be produced according to the sanitary standards of this Ordinance. The word "milk" shall be interpreted to include sheep milk.

OO. TRANSFER STATION: A transfer station is any place, premises, or establishment where milk or milk products are transferred directly from one (1) milk tank truck to another.

PP. ULTRA-PASTEURIZATION (UP): The term "Ultra-Pasteurization", when used to describe a dairy product, means that such product shall have been thermally processed at or above 138°C (280°F) for at least two (2) seconds, either before or after packaging, so as to produce a product, which has an extended shelf life under refrigerated conditions. (Refer to 21 CFR 131.3)

QQ. WATER BUFFALO MILK: Water buffalo milk is the normal lacteal secretion, practically free of colostrums, obtained by the complete milking of one (1) or more healthy water buffalo. Water buffalo milk shall be produced according to the sanitary standards of this

Ordinance. The word "milk" shall be interpreted to include water buffalo milk. (Refer to the [last NOTE: in Section 6.](#))

RR. Whey Products: Whey products mean any fluid product removed from whey; or made by the removal of any constituent from whey; or by the addition of any wholesome substance to whey or parts thereof.

1. OO-1. Grade "A" Whey Products: Grade "A" whey products means any fluid product removed from whey; or made by the removal of any constituent from whey; or by the addition of any wholesome substance to whey or parts thereof which have been manufactured under the provisions of this Ordinance.
2. OO-2. Dry Whey Products: Dry whey products mean products resulting from the drying of whey or whey products and any product resulting from the combination of dry whey products with other wholesome dry ingredients.
3. OO-3. Grade "A" Concentrated (Condensed) and Dry Whey and Whey Products: Grade "A" concentrated (condensed) and dry whey and whey products means concentrated (condensed) or dry whey and whey products, which complies with the applicable provisions of this Ordinance. The words "concentrated (condensed) and dry milk products" shall be interpreted to include concentrated (condensed) and dry whey and whey products.

SECTION 2. ADULTERATED OR MISBRANDED MILK OR MILK PRODUCTS

No person shall, within the ... of ...¹, or its jurisdiction, produce, provide, sell, offer, or expose for sale or have in possession with intent to sell any milk or milk product, which is adulterated or misbranded. Provided, that in an emergency, the sale of pasteurized milk and milk products, which do not fully meet the requirements of this Ordinance, may be authorized by the Regulatory Agency.

Any adulterated or misbranded milk or milk products, may be impounded by the Regulatory Agency and disposed of in accordance with applicable laws or regulations.

ADMINISTRATIVE PROCEDURES

This Section of the Ordinance shall be used in impounding the milk or milk products of, or preferring charges against, persons who adulterate or misbrand their milk or milk products; or label them with any grade designation not authorized by the Regulatory Agency under the terms of this Ordinance; or who sell or deliver ungraded milk or milk products, except as may be permitted under this Section in an emergency. An emergency is defined as a general and acute shortage in the milk shed, not simply one (1) distributor's shortage.

SECTION 3. PERMITS

It shall be unlawful for any person who does not possess a permit from the Regulatory Agency of the ... of ...¹ to manufacture, brings into, sends into or receives into the ... of ...¹ or its jurisdiction, for sale, or to sell, or offer for sale therein or to have in storage any milk or milk products, defined in this Ordinance. Provided, that grocery stores, restaurants, soda fountains and similar establishments where milk or milk products are served or sold at retail, but not processed may be exempt from the requirements of this Section. Provided further, that brokers, agents, and distributors representing, buying from, and/or selling condensed and dry milk products from or to a milk plant having a valid permit are not required to have a permit.

Only a person who complies with the requirements of this Ordinance shall be entitled to receive and retain such a permit. Milk plants, receiving stations and transfer stations permitted under the NCIMS HACCP Program shall meet the applicable provisions of this Ordinance, including Appendix K. Permits shall not be transferable with respect to persons and/or locations.

Provided, that the manufacture of condensed and dry milk products, which do not meet the requirements of this Ordinance for Grade "A" condensed or dry milk products and which are intended for other uses, shall not be construed to violate the terms of this Ordinance, if such products are processed, packaged and stored separately and are plainly identified.

It shall be unlawful for any person to manufacture in a milk plant under a permit for Grade "A" condensed or dry milk products in the...of...¹ or its jurisdiction any condensed and dry milk products which do not meet the requirements of this Ordinance for Grade "A" condensed or dry milk products without a permit from the Regulatory Authority who shall require that such condensed and dry milk products be processed, packaged and stored separately from Grade "A" condensed or dry milk products and that each container of such products be plainly marked in such a manner as to prevent confusion of the product with Grade "A" condensed or dry milk products.

The Regulatory Agency shall suspend such permit, whenever it has reason to believe that a public health hazard exists; or whenever the permit holder has violated any of the requirements of this Ordinance; or whenever the permit holder has interfered with the Regulatory Agency in the performance of its duties. Provided, that the Regulatory Agency shall, in all cases, except where the milk or milk product involved creates, or appears to create, an imminent hazard to the public health; or in any case of a willful refusal to permit authorized inspection/audit, serve upon the holder a written notice of intent to suspend permit, which notice shall specify with particularity the violation(s) in question and afford the holder such reasonable opportunity to correct such violation as may be agreed to by the parties, or in the absence of agreement, fixed by the Regulatory Agency, before making any order of suspension effective. A suspension of permit shall remain in effect until the violation(s) has been corrected to the satisfaction of the Regulatory Agency.

Upon notification, acceptable to the Regulatory Agency, by any person whose permit has been suspended, or upon application within forty-eight (48) hours of any person who has been served with a notice of intention to suspend, and in the latter case before suspension, the Regulatory Agency shall within seventy-two (72) hours proceed to a hearing to ascertain the facts of such violation(s) or interference and upon evidence presented at such hearing shall affirm, modify or rescind the suspension or intention to suspend.

Upon repeated violation(s), the Regulatory Agency may revoke such permit following reasonable notice to the permit holder and an opportunity for a hearing. This Section is not intended to preclude the institution of court action as provided in Sections 5 and 6.

ADMINISTRATIVE PROCEDURES

ISSUANCE OF PERMITS: Every milk producer, milk distributor, bulk milk hauler/sampler, milk tank truck⁵, milk transportation company and each milk plant, receiving station, transfer station, milk tank truck cleaning facility operator shall hold a valid permit. The permit for a milk tank truck(s) may be issued to the milk transportation company. Milk producers who transport milk or milk products only from their own dairy farms; employees of a milk distributor or milk plant operator who possesses a valid permit; and employees of a milk transportation company that possesses a valid permit and transports milk or milk products from a milk plant, receiving station or transfer station shall not be required to possess a bulk milk hauler/sampler's permit. Grocery stores, restaurants, soda fountains and similar establishments where milk and milk products are served or sold at retail, but not processed, may be exempt from the requirements of this Section.

While compliance with the requirements for Grade "A" condensed and dry milk products is necessary to receive and retain a permit for these products, it is not the intent of this Ordinance to limit the production of a milk plant that condenses and/or dries milk or milk products, to Grade "A" products.

The manufacture of ungraded products for other uses in milk plants operating under a permit for the manufacture of Grade "A" condensed and dry milk products is allowed under conditions specified in Section 7 of this Ordinance and whereby such products are processed, packaged, and stored separately. In such cases, a second permit is required, which is issued with the understanding that ungraded products will be handled in such a manner so as to avoid confusion with the Grade "A" production.

Either or both permits may be temporarily suspended for the violation of any applicable provision of this Ordinance, or revoked for a serious or repeated violation. Suspension of permits for violation of sanitation Items of Section 7 is provided for in Section 5. In addition, the Regulatory Agency may, at any time, institute court action under the provisions of Section 6. There is no specific frequency for the issuance of permits. This should be in accordance with the policies of the Regulatory Agency and in agreement with those employed for the issuance of permits under this Ordinance.

SUSPENSION OF PERMIT: When any requirement(s) of this Ordinance is violated, the permit holder is subject to the suspension of their permit.

The Regulatory Agency may forego suspension of the permit, provided the milk or milk product in violation is not sold or offered for sale as Grade "A" milk or milk product. A Regulatory Agency may allow the imposition of a monetary penalty in lieu of a permit suspension, provided the milk or milk product in violation is not sold or offered for sale as Grade "A" milk or milk product. Except, that a milk producer may be assessed a monetary penalty in lieu of permit suspension for violative counts provided:

1. If the monetary penalty is due to a violation of the bacterial or cooling temperature standards, the Regulatory Agency shall conduct an inspection of the facility and operating methods and make the determination that the conditions responsible for the violation have been corrected. Samples shall then be taken at the rate of not more than two (2) per week on separate days within a three (3) week period in order to determine compliance with the appropriate standard as determined in accordance with Section 6 of this Ordinance.

2. If the monetary penalty is due to a violation of the somatic cell count standard, the Regulatory Agency shall verify that the milk supply is within acceptable limits as prescribed in Section 7 of this Ordinance. Samples shall then be taken at the rate of not more than two (2) per week on separate days within a three (3) week period in order to determine compliance with the appropriate standard as determined in accordance with Section 6 of this Ordinance.

HEARINGS: If a State Administrative Procedure Act (APA), which provides procedures for administrative hearings and judicial review of administrative determinations, is available, the APA shall be made applicable by reference to the hearings provided for in the Ordinance. If such APA is not available, appropriate procedures, including provision for notice, hearing officer, their authority, record of hearing, rules of evidence and court review shall be established by the appropriate authority.

REINSTATEMENT OF PERMITS: Any permit holder whose permit has been suspended may make written application for the reinstatement of their permit.

When the permit suspension has been due to a violation of any of the bacterial, coliform or cooling temperature standards, the Regulatory Agency, within one (1) week after the receipt of notification for reinstatement of permit, shall issue a temporary permit after determining by an inspection of the facilities and operating methods that the conditions responsible for the violation have been corrected. When a permit suspension has been due to a violation of the somatic cell count standard, the Regulatory Agency may issue a temporary permit whenever a resampling of the herd's milk supply indicates the milk supply to be within acceptable limits as prescribed in Section 7. Samples shall then be taken at the rate of not more than two (2) per week on separate days within a three (3) week period and the Regulatory Agency shall reinstate the permit upon compliance with the appropriate standard as determined in accordance with Section 6 of this Ordinance.

Whenever the permit suspension has been due to a violation of a requirement other than bacteriological, coliform, somatic cell count, drug residue test or cooling-temperature standards, the notification shall indicate that the violation(s) has been corrected. Within one (1) week of the receipt of such notification, the Regulatory Agency shall make an inspection/audit of the applicant's facility, and as many additional inspections/audits thereafter as are deemed necessary, to determine that the applicant's facility is complying with the requirements. When the findings justify, the permit shall be reinstated.

When a permit suspension has been due to a positive drug residue, the permit shall be reinstated in accordance with the provisions of Appendix N.

SECTION 4. LABELING

All bottles, containers and packages containing milk or milk products defined in Section 1 of this Ordinance shall be labeled in accordance with the applicable requirements of the FFD&CA, the Nutrition Labeling and Education Act (NLEA) of 1990, and regulations developed there under, the CFR, and in addition, shall comply with applicable requirements of this Section as follows:

All bottles, containers and packages containing milk or milk products, except milk tank trucks, storage tanks and cans of raw milk from individual dairy farms, shall be conspicuously marked with:

1. The identity of the milk plant where pasteurized, ultra-pasteurized, aseptically processed, condensed and/or dried.
2. The words "keep refrigerated after opening" in the case of aseptically processed milk and milk products.
3. The common name of the hooved mammal producing the milk shall precede the name of the milk or milk product when the product is or is made from other than cattle's milk. As an example, "Goat", "Sheep", "Water Buffalo", or "Other Hooved Mammal" milk or milk products respectively. (Refer to the [last NOTE: in Section 6.](#))
4. The words "Grade "A"" on the exterior surface. Acceptable locations shall include the principal display panel, the secondary or informational panel, or the cap/cover.
5. The word "reconstituted" or "recombined" if the product is made by reconstitution or recombination.
6. In the case of condensed or dry milk products the following shall also apply:
 - a. The identity of the Regulatory Agency issuing such permit; and if distributed by another party, the name and address of the distributor shall be shown by a statement, such as "Distributed by".
 - b. A code or lot number identifying the contents with a specific date, run, or batch of the product, and the quantity of the contents of the container.

All vehicles and milk tank trucks containing milk or milk products shall be legibly marked with the name and address of the milk plant or hauler in possession of the contents.

Milk tank trucks transporting raw, heat-treated or pasteurized milk and milk products to a milk plant from another milk plant, receiving station or transfer station are required to be marked with the name and address of the milk plant or hauler and shall be sealed; in addition, for each such shipment, a shipping statement shall be prepared containing at least the following information:

1. Shipper's name, address and permit number. Each milk tank truck containing milk shall include the IMS Bulk Tank Unit (BTU) identification number(s) or the IMS Listed Milk Plant Number, for farm groups listed with a milk plant, on the weight ticket or manifest.
2. Permit identification of hauler, if not an employee of the shipper.
3. Point of origin of shipment.
4. Tanker identification number.
5. Name of product.

6. Weight of product.
7. Temperature of product when loaded.
8. Date of shipment.
9. Name of supervising Regulatory Agency at the point of origin of shipment.
10. Whether the contents are raw, pasteurized, or in the case of cream, low fat or skim milk, whether it has been heat-treated.
11. Seal number on inlet, outlet, wash connections and vents.
12. Grade of product.

All cans of raw milk from individual dairy farms shall be identified by the name or number of the individual milk producer.

Each milk tank truck containing milk shall be accompanied by documentation, weigh ticket or manifest, which shall include the IMS BTU Identification Number(s) or the IMS Listed Milk Plant Number, for farm groups listed with a milk plant.

ADMINISTRATIVE PROCEDURES

The purpose of this Section is to require labeling that will permit easy identification of the milk and milk product and its origin. It is required that the milk or milk product be designated by its common or usual name.

LABELING OF EMERGENCY SUPPLIES: When the sale of ungraded milk or milk products is authorized during emergencies, under the terms of Section 2, the label must bear the designation "ungraded". When such labeling is not available, the Regulatory Agency shall take immediate steps to inform the public that the particular supply is "ungraded" and that the supply will be properly labeled as soon as the distributor can obtain the required labels.

IDENTITY LABELING: "Identity", as used in this Section, is defined as the name and address or permit number of the milk plant at which the pasteurization, ultra-pasteurization, aseptic processing, condensing and/or drying takes place. It is recommended that the voluntary national uniform coding system for the identification of milk plants, at which milk and milk products are packaged, be adopted in order to provide a uniform system of codes throughout the country.

In cases where several milk plants are operated by one firm, the common firm name may be utilized on milk bottles, containers and packages. Provided, that the location of the milk plant at which the contents were pasteurized, ultra-pasteurized, aseptically processed, condensed and/or dried is also shown, either directly or by a code. This requirement is necessary in order to enable the Regulatory Agency to identify the source of the pasteurized, ultra-pasteurized, aseptically processed, condensed and/or dried milk or milk products. The street address of the milk plant need not be shown when only one (1) milk plant of a given name is located within the municipality.

The identity labeling requirement may be interpreted as permitting milk plants and persons to purchase and distribute, under their own label, milk and milk products processed and packaged at another milk plant, provided, that the label reads, "Processed at ... (name and address)", or that the processing and packaging milk plant is identified by a proper code.

MISLEADING LABELS: The Regulatory Agency shall not permit the use of any misleading marks, words or endorsements upon the label. They may permit the use of registered trade designs or similar terms on the bottle cap or label, when in their opinion, they are not misleading and are not so used as to obscure the labeling required by this Ordinance. For dry milk products, the outer bag must be preprinted "Grade "A" before filling. The use of super grade designations shall not be permitted. However, this should not be construed as prohibiting the use of official grade designations awarded to dry milk products by the United States Department of Agriculture (USDA). Grade designations such as "Grade "AA" Pasteurized", "Selected Grade "A" Pasteurized", "Special Grade "A" Pasteurized", etc., give the consumer the impression that such a grade is significantly safer than Grade "A". Such an implication is false, because the Ordinance requirements for Grade "A" pasteurized, ultra-pasteurized, or aseptically processed milk when properly enforced, will ensure that this grade of milk will be as safe as milk can practically be made. Descriptive labeling terms must not be used in conjunction with the Grade "A" designation or name of the milk or milk product and must not be false or misleading.

SECTION 5. INSPECTION OF DAIRY FARMS AND MILK PLANTS

Each dairy farm, milk plant, receiving station, transfer station, milk tank truck cleaning facility whose milk or milk products are intended for consumption within ...of...¹ or it's jurisdiction, and each bulk milk hauler/sampler who collects samples of raw milk for pasteurization, for bacterial, chemical or temperature standards and hauls milk from a dairy farm to a milk plant, receiving station or transfer station and each milk tank truck and its appurtenances shall be inspected/audited by the Regulatory Agency prior to the issuance of a permit. Following the issuance of a permit, the Regulatory Agency shall:

1. Inspect each milk tank truck and its appurtenances used by a bulk milk hauler/sampler who collects samples of raw milk for pasteurization for bacterial, chemical or temperature standards and hauls milk from a dairy farm to a milk plant, receiving station or transfer station, at least once every twelve (12) months.
2. Inspect each bulk milk hauler/sampler's, dairy plant sampler's and industry plant sampler's pickup and sampling procedures at least once every twenty-four (24) months.
3. Inspect each milk plant and receiving station at least once every three (3) months, except that, for those milk plants and receiving stations that have HACCP Systems, which are regulated under the NCIMS HACCP Program, regulatory audits shall replace the regulatory inspections described in this Section. The requirements and minimum frequencies for these regulatory audits are specified in Appendix K.
4. Inspect each milk tank truck cleaning facility and transfer station at least once every six (6) months, except that, for those transfer stations that have HACCP Systems, which are regulated under the NCIMS HACCP Program, regulatory audits shall replace the regulatory inspections described in this Section. The requirements and minimum frequencies for these regulatory audits are specified in Appendix K.
5. Inspect each dairy farm at least once every six (6) months.⁶

Should the violation of any requirement set forth in Section 7, or in the case of a bulk milk hauler/sampler, industry plant sampler or milk tank truck also Section 6 and Appendix B, be found to exist on an inspection/audit, a second inspection/audit shall be required after the time deemed necessary to remedy the violation, but not before three (3) days. This second inspection/audit shall be used to determine compliance with the requirements of Section 7 or in the case of a bulk milk hauler/sampler, industry plant sampler or milk tank truck also Section 6 and Appendix B. Any violation of the same requirement of Section 7, or in the case of a bulk milk hauler/sampler or milk tank truck also Section 6 and Appendix B, on such second inspection/audit, shall call for permit suspension in accordance with Section 3 and/or court action or in the case of an industry plant sampler, shall cease the collection of official regulatory samples until successfully re-trained and re-evaluated by the Regulatory Agency. Provided, that when the Regulatory Agency finds that a critical processing element violation involving:

1. Proper pasteurization, whereby every particle of milk or milk product may not have been heated to the proper temperature and held for the required time in properly designed and operated equipment;
2. A cross-connection exists whereby direct contamination of pasteurized milk or milk product is occurring; or

3. Conditions exist whereby direct contamination of pasteurized milk or milk product is occurring.

The Regulatory Agency shall take immediate action to prevent further movement of such milk or milk product until such violations of critical processing element(s) have been corrected. Should correction of such critical processing element(s) not be accomplished immediately, the Regulatory Agency shall take prompt action to suspend the permit as provided for in Section 3 of this Ordinance. Provided, that in the case of milk plants producing aseptically processed milk and milk products, when an inspection of the milk plant and its records reveal that the process used has been less than the required scheduled process, it shall be considered an imminent hazard to public health and the Regulatory Agency shall take immediate action to suspend the permit of the milk plant for the sale of aseptically processed milk and milk products in conformance with Section 3 of this Ordinance.

One (1) copy of the inspection/audit report shall be handed to the operator, or other responsible person or be posted in a conspicuous place on an inside wall of the establishment. Said inspection/audit report shall not be defaced and shall be made available to the Regulatory Agency upon request. An identical copy of the inspection/audit report shall be filed with the records of the Regulatory Agency.

The Regulatory Agency shall also make such other inspections and investigations as are necessary for the enforcement of this Ordinance.

Every permit holder shall, upon the request of the Regulatory Agency, permit access of officially designated persons to all parts of their establishment or facilities to determine compliance with the provisions of this Ordinance. A distributor or milk plant operator shall furnish the Regulatory Agency, upon request, for official use only, a true statement of the actual quantities of milk and milk products of each grade purchased and sold, a list of all sources of such milk and milk products, records of inspections, tests and pasteurization time and temperature records.

It shall be unlawful for any person who, in an official capacity, obtains any information under the provisions of this Ordinance, which is entitled to protection as a trade secret, including information as to the quantity, quality, source or disposition of milk or milk products or results of inspections/audits or tests thereof, to use such information to their own advantage or to reveal it to any unauthorized person.

ADMINISTRATIVE PROCEDURES

INSPECTION FREQUENCY: For the purposes of determining the inspection frequency for dairy farms and transfer stations the interval shall include the designated six (6) month period plus the remaining days of the month in which the inspection is due.

For the purposes of determining the inspection frequency for milk plants and receiving stations the interval shall include the designated three (3) month period plus the remaining days of the month in which the inspection is due.

One (1) milk tank truck inspection every twelve (12) months, or bulk milk hauler/sampler's or industry plant sampler's pickup and sampling procedures inspection each twenty-four (24) months, or one (1) producer, transfer station, or milk tank truck cleaning facility inspection every six (6) months, or one (1) milk plant or receiving station inspection every three (3) months is not a desirable frequency, it is instead a legal minimum. Bulk milk hauler/samplers, industry plant samplers, milk tank trucks, milk tank truck cleaning facilities, dairy farms, milk plants, receiving stations and transfer stations experiencing difficulty meeting requirements should be visited more frequently. Milk plants that condense and/or dry milk or milk products and which operate for a short duration of time or

intermittent periods of time should also be inspected more frequently. Inspections of dairy farms shall be made at milking time as often as possible and of milk plants at different times of the day in order to ascertain if the processes of equipment assembly, sanitizing, pasteurization, cleaning and other procedures comply with the requirements of this Ordinance.

For the purpose of determining the minimum audit frequency for milk plants, receiving stations and transfer stations regulated under the NCIMS HACCP Program the interval shall include the remaining days of the month in which the audit is due.

ENFORCEMENT PROCEDURES: This Section provides that a dairy farm, bulk milk hauler/sampler, milk tank truck, milk tank truck cleaning facility, milk plant, receiving station, transfer station or distributor, except those processing aseptically processed milk and milk products, shall be subject to suspension of permit and/or court action if two (2) successive inspections disclose a violation of the same requirement.

Experience has demonstrated that strict enforcement of the Ordinance leads to a better and friendlier relationship between the Regulatory Agency and the milk industry than does a policy of enforcement, which seeks to excuse violations and to defer penalty thereof. The sanitarian's criterion of satisfactory compliance should be neither too lenient nor unreasonably stringent. When a violation is discovered, the sanitarian should point out to the milk producer, bulk milk hauler/sampler, industry plant sampler, responsible person for the milk tank truck, milk tank truck cleaning facility, milk plant, receiving station, transfer station or distributor the requirement that has been violated, discuss a method for correction and set a time for correcting the violated requirement.

The penalties of suspension or revocation of permit and/or court action are provided to prevent continued violation of the provisions of this Ordinance but are worded to protect the dairy industry against unreasonable or arbitrary action. When a condition is found which constitutes an imminent health hazard, prompt action is necessary to protect the public health; therefore, the Regulatory Agency is authorized in Section 3, to suspend the permit immediately. However, except for such emergencies, no penalty is imposed on the milk producer, bulk milk hauler/sampler, responsible person for the milk tank truck, milk tank truck cleaning facility, milk plant, receiving station, transfer station or distributor upon the first violation of any of the sanitation requirements listed in Section 7. A milk producer, bulk milk hauler/sampler, responsible person for the milk tank truck, milk tank truck cleaning facility, milk plant, receiving station, transfer station or distributor found violating any requirement must be notified in writing and given a reasonable time to correct the violation(s) before a second inspection is made, but not before three (3) days. The requirement of giving written notice shall be deemed to have been satisfied by the handing to the operator or by the posting of an inspection report, as required by this Section. After receipt of a notice of violation, but before the allotted time has elapsed, the milk producer, bulk milk hauler/sampler, responsible person for the milk tank truck, milk tank truck cleaning facility, milk plant, receiving station, transfer station or distributor shall have an opportunity to appeal the sanitarian's interpretation to the Regulatory Agency or request an extension of the time allowed for correction.

ENFORCEMENT PROCEDURES - ASEPTIC PROCESSING MILK PLANTS: Because aseptically processed milk and milk products are stored at room temperature and are not refrigerated after processing they must be considered an imminent hazard to public health whenever it is revealed by an inspection or a review of the processing records that the process is less than the required scheduled process and the products produced have not maintained their commercial sterility. Prompt action by the Regulatory Agency to suspend the permit must be initiated in order to protect the public health. The Regulatory Agency shall stop the sale of all under-processed milk or milk product and follow at least the minimum requirements of 21 CFR 113.89 before releasing any product. (Refer to Appendix L.)

CERTIFIED INDUSTRY INSPECTION: The Regulatory Agency may certify industry personnel, with their consent, to carry out cooperatively the provisions of this Ordinance with respect to the supervision of dairy farms, bulk milk haul/sampler's pickup and sampling procedures, and/or milk tank trucks. States utilizing certified industry inspections shall have on file and available for review, a written program that describes how the requirements of this Ordinance and related documents shall be implemented. Delegation of the inspection and evaluation of bulk milk hauler/sampler's pickup and sampling procedures shall be done by the Sampling Surveillance Officer in accordance with the Evaluation of Milk Laboratories (EML).

Reports of all inspections conducted by such personnel to determine compliance with the provisions of this Ordinance shall be maintained by the industry at a location acceptable to the Regulatory Agency. The Certified Industry Inspector may perform all punitive actions and all inspections for the issuance or reinstatement of permits. Initial inspections and change of market inspections are required and shall be conducted by the Regulatory Agency in conjunction with the Certified Industry Inspector.

When a producer changes market, the producer records for the preceding twenty-four (24) months shall be transferred with the producer, through the Regulatory Agency, and will continue to be a part of the producer's record.

Industry personnel shall be certified every three (3) years by the Regulatory Agency.

At least annually, the Certified Industry Inspector shall attend an educational seminar provided by the Regulatory Agency, or equivalent training acceptable to the Regulatory Agency.

At least once in each six (6) month period, the Regulatory Agency shall inspect the records maintained by the Industry for the Certified Industry Inspection Program and conduct farm field work to assure the program meets the provisions of the Regulatory Agency's written plan and requirements of this Ordinance and related documents.

Initial certification by the Regulatory Agency shall not be made during the course of an official inspection. Re-certification by the Regulatory Agency may be conducted during the course of an official inspection.

Purpose of Certification: The purpose of certification is to have the applicant formally demonstrate their inspection ability to apply proper interpretations of this Ordinance, related documents, and the Regulatory Agency's procedures.

Designation of Individuals to Be Certified: Candidates shall submit requests for certification to the Regulatory Agency. The applicant for certification shall have had experience in the field of milk sanitation, and shall be an employee of a milk plant, a producer association, officially designated laboratory or shall be employed on a consulting basis.

Recording of Qualification Data: Prior to conducting the certification procedure, background information shall be secured on the applicant. This shall include academic training, experience in milk sanitation and related fields, in-service courses attended, etc. This information is to be retained by the Regulatory Agency as part of the applicant's file, along with appropriate records of the applicant's performance during the certification examination.

Field Procedure: Only one (1) applicant shall be certified at a time. The certification is to be conducted without prompting from the Regulatory Agency or comparison of inspection results in any way until the entire procedure is completed. Initial certification shall not be made during the course of an official inspection by the Regulatory Agency.

At least twenty-five (25) randomly selected dairy farms and/or five (5) milk tank trucks shall be visited. After the necessary inspections have been completed, the Regulatory Agency shall compare their results with those of the candidate. The percentage agreement for each Item of sanitation shall be determined by dividing the number of agreements by the total number of dairy farms and/or milk tank trucks inspected.

Criteria for Certification: In order to be certified, an industry inspector shall agree with the Regulatory Agency eighty percent (80%) of the time on individual Items of sanitation and shall further agree to comply with the administrative procedures established by the Regulatory Agency for the program of dairy farm and/or milk tank truck supervision. The Regulatory Agency should allow sufficient time to discuss the findings with the applicant.

Duration of Certification: Certification of industry inspection personnel shall be for a period not exceeding three (3) years from the date of formal certification or re-certification, unless revoked.

Re-Certification: The Regulatory Agency shall notify the certified industry inspector of the need for certification renewal at least sixty (60) days prior to its expiration. If re-certification is desired, the inspector will make appropriate arrangements for the renewal procedure. Re-certification can be made for the succeeding three (3) year period, by following the procedures outlined above. Provided, that re-certification may be conducted during the course of an official inspection by the Regulatory Agency.

Reports and Records: Upon satisfactory completion of certification or re-certification, the certified industry inspector shall be issued a certificate. The milk plant(s) or officially designated laboratory(ies) employing the inspector shall be formally notified by letter of the certification. The letter shall outline the purpose of the certification and the conditions under which the certification may be retained. A copy of the notification letter, together with a copy of the qualification data above and a resume of the percentage agreement on individual items, shall be retained by the Regulatory Agency.

Revocation of Certification: The certification of an industry inspector may be revoked by the Regulatory Agency upon a finding that the inspector is:

1. Not in agreement with the Regulatory Agency at least eighty percent (80%) of the time on Items of sanitation in a field examination conducted as described in the Field Procedure outlined above; or
2. Not complying with the established administrative procedures of the Regulatory Agency for the program; or
3. Failing to carry out the provisions of this Ordinance in the course of the inspector's work.

INSPECTION/AUDIT REPORTS: A copy of the inspection/audit report shall be filed as directed by the Regulatory Agency and retained for at least twenty-four (24) months. The results shall be entered on appropriate ledger forms. The use of a computer or other information retrieval system may be used. Examples of field inspection/audit forms are identified in Appendix M.

SECTION 6. THE EXAMINATION OF MILK AND MILK PRODUCTS

It shall be the responsibility of the bulk milk hauler/sampler to collect a representative sample of milk from each farm bulk tank prior to transferring milk from a farm bulk tank, truck or other container. All samples shall be collected and delivered to a milk plant, receiving station, transfer station or other location approved by the Regulatory Agency.

1. During any consecutive six (6) months, at least four (4) samples of raw milk for pasteurization shall be collected from each producer, in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days. These samples shall be obtained under the direction of the Regulatory Agency or shall be taken from each producer under the direction of the Regulatory Agency and delivered in accordance with this Section.
2. During any consecutive six (6) months, at least four (4) samples of raw milk for pasteurization, ultra-pasteurization or aseptic processing, shall be collected in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days. These samples shall be obtained by the Regulatory Agency, from each milk plant after receipt of the milk by the milk plant and prior to pasteurization, ultra-pasteurization or aseptic processing.
3. During any consecutive six (6) months, at least four (4) samples of heat-treated milk products, from milk plants offering such products for sale, shall be collected by the Regulatory Agency in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days.
4. During any consecutive six (6) months, at least four (4) samples of pasteurized milk, flavored milk, flavored reduced fat or low fat milk, flavored nonfat (skim) milk, each fat level of reduced fat or low fat milk and each milk product defined in this Ordinance, (including aseptically processed milk and milk products for drug residue tests) shall be collected by the Regulatory Agency in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days from every milk plant.

NOTE: If the production of any Grade "A" condensed or dry milk product as defined in this Ordinance is not on a yearly basis, at least 5 samples shall be taken within a continuous production period.

Samples of milk and milk products shall be taken while in the possession of the producer, milk plant or distributor at any time prior to delivery to the store or consumer. Samples of milk and milk products from dairy retail stores, food service establishments, grocery stores and other places where milk and milk products are sold shall be examined periodically as determined by the Regulatory Agency and the results of such examination shall be used to determine compliance with Sections 2, 4 and 10. Proprietors of such establishments shall furnish the Regulatory Agency, upon request, with the names of all distributors from whom milk or milk products are obtained.

Required bacterial counts somatic cell counts and cooling temperature checks shall be performed on raw milk for pasteurization. In addition, drug tests on each producer's milk shall be conducted at least four (4) times during any consecutive six (6) months.

Required bacterial counts, drug tests, except those products for which there are not any approved drug test kits available, coliform determinations, phosphatase and cooling temperature determinations shall

be performed on Grade "A" pasteurized milk and milk products defined in this Ordinance. Required drug residue tests shall be performed on aseptically processed milk and milk products.

NOTE: When multiple samples of the same milk or milk products, except for aseptically processed milk and milk products, are collected from the same producer or processor from multiple tanks or silos on the same day, the laboratory results are averaged arithmetically by the Regulatory Agency and recorded as the official results for that day. This is applicable for bacterial (standard plate count and coliform), somatic cell count and temperature determinations only.

Whenever two (2) of the last four (4) consecutive bacterial counts (except those for aseptically processed milk and milk products), somatic cell count, coliform determinations, or cooling temperatures, taken on separate days, exceed the standard for the milk and/or milk products as defined in this Ordinance, the Regulatory Agency shall send a written notice thereof to the person concerned. This notice shall be in effect as long as two (2) of the last four (4) consecutive samples exceed the standard. An additional sample shall be taken within twenty-one (21) days of the sending of such notice, but not before the lapse of three (3) days. Immediate suspension of permit, in accordance with Section 3, and/or court action shall be instituted whenever the standard is violated by three (3) of the last five (5) bacterial counts (except those for aseptically processed milk and milk products), somatic cell counts, coliform determinations or cooling temperatures.

Whenever a phosphatase test is positive, the cause shall be determined. Where the cause is improper pasteurization, it shall be corrected and any milk or milk product involved shall not be offered for sale.

Whenever a pesticide residue test is positive, an investigation shall be made to determine the cause and the cause shall be corrected. An additional sample shall be taken and tested for pesticide residues and no milk or milk products as defined in this Ordinance shall be offered for sale until it is shown by a subsequent sample to be free of pesticide residues or below the actionable levels established for such residues.

Whenever a drug residue test is confirmed positive, an investigation shall be made to determine the cause, and the cause shall be corrected in accordance with the provisions of Appendix N.

Whenever a container or containers of aseptically processed milk or milk product is found to be non-sterile, due to under-processing, the Regulatory Agency shall consider this to be an imminent hazard to public health and shall suspend the permit of the milk plant for the sale of aseptically processed milk and milk products. No aseptically processed milk and milk product shall be sold until it can be shown that the processes, equipment and procedures used are suitable for consistent production of a sterile product. All products from the lot that were found to contain one (1) or more non-sterile units shall be recalled and disposed of as directed by the Regulatory Agency.

Samples shall be analyzed at an appropriate official or officially designated laboratory. All sampling procedures, including the use of approved in-line samplers, and required laboratory examinations shall be in substantial compliance with the most current edition of Standard Methods for the Examination of Dairy Products (SMEDP) of the American Public Health Association, and the most current edition of Official Methods of Analysis of AOAC INTERNATIONAL (OMA). Such procedures, including the certification of sample collectors and examinations shall be evaluated in accordance with the EML. Aseptically processed milk and milk products packaged in hermetically sealed containers shall be tested in accordance with FDA's Bacteriological Analytical Manual (BAM).

Each milk plant regulated under the NCIMS HACCP Program shall adequately document its response to each regulatory sample test result that exceeds any maximum level specified in Section 7 of this

Ordinance. The Regulatory Agency will monitor and verify that appropriate action(s) was taken by the milk plant.

Examinations and tests to detect adulterants, including pesticides, shall be conducted, as the Regulatory Agency requires. When the Commissioner of the FDA determines that a potential problem exists with animal drug residues or other contaminants in the milk supply, samples shall be analyzed for the contaminant by a method(s) determined by FDA to be effective in determining compliance with actionable levels or established tolerances. This testing will continue until such time that the Commissioner of the FDA is reasonably assured that the problem has been corrected. The determination of a problem is to be based upon:

1. Sample survey results;
2. USDA tissue residue data from cull and veal dairy animals;
3. Animal drug disappearance and sales data;
4. State feed back; and
5. Other relevant information.

Assays of milk and milk products as defined in this Ordinance, to which vitamin (s) A and/or D have been added, shall be made at least annually in a laboratory, which has been accredited by FDA and which is acceptable to the Regulatory Agency, using test methods acceptable to FDA or other official methodologies, which gives statistically equivalent results to the FDA methods.

Vitamin testing laboratories are accredited if they have one (1) or more certified analysts and meet the quality control requirements of the program established by FDA. Laboratory accreditation and analyst certification parameters are specified in the EML manual.

In addition, all facilities fortifying milk or milk products with vitamins must keep volume control records. These volume control records must cross reference the form and amount of vitamin D, vitamin A and/or vitamins A and D used with the amount of products produced and indicate a percent of expected use, plus or minus.

ADMINISTRATIVE PROCEDURES

ENFORCEMENT PROCEDURES: All violations of bacteria, coliform, confirmed somatic cell counts and cooling temperature standards should be followed promptly by inspection to determine and correct the cause. (Refer to Appendix E. Examples of Three (3)-out-of-Five (5) Compliance Enforcement Procedures)

Aseptically processed milk and milk products packaged in hermetically sealed containers are exempt from the refrigerated storage requirements of this Ordinance. Therefore, whenever a breakdown in the processing or packaging of these products occurs an imminent hazard to public health exists. Prompt action is needed by the Regulatory Agency. Milk plants aseptically processing milk and milk products in hermetically sealed containers should be encouraged to perform bacterial and other quality tests on each lot of aseptically processed milk and milk product produced in order to ascertain that these products have been properly processed and have not been rendered non-sterile after aseptic processing and packaging. The Regulatory Agency may utilize industry records, of each lot of aseptically processed milk and milk products, to determine when lots can be released for sale after a violation of the bacterial standards has existed.

LABORATORY TECHNIQUES: Procedures for the collection, including the use of approved in-line samplers, and holding of samples; the selection and preparation of apparatus, media and reagents; and the analytical procedures, incubation, reading and reporting of results, shall be in substantial compliance with the FDA 2400 series forms, SMEDP and OMA. The procedures shall be those specified therein for:

1. Standard plate count at 32°C (agar or Petrifilm method).
2. Alternate methods, including the Plate Loop Count, and the BactoScan FC for viable counts for raw milk, and the Petrifilm method for pasteurized milk and milk products at 32°C.
3. Coliform test with solid media or Petrifilm method at 32°C for all milk and milk products, and the Petrifilm High Sensitivity Coliform Count method for all milk and milk products, except unflavored whole, reduced or low fat and nonfat (skim) milk.
4. A viable bacterial count of nonfat dry milk and dry whey shall be made in accordance with the procedures in SMEDP for the Standard Plate Count of Dry Milk, except agar plates shall be incubated for 72 hours.
5. Beta lactam methods which have been independently evaluated or evaluated by FDA and have been found acceptable by FDA for detecting drug residues in raw milk, or pasteurized milk, or that particular type of pasteurized milk product at current safe or tolerance levels, shall be used for each drug of concern, except those products for which there are not any approved drug test kits available. Regulatory action shall be taken on all confirmed positive results. (Refer to Appendix N.) A result shall be considered positive if it has been obtained by using a method, which has been evaluated and deemed acceptable by FDA and accepted by the NCIMS at levels established in memoranda transmitted periodically by FDA as required by Section IV of Appendix N.
6. Screening and Confirmatory Methods for the Detection of Abnormal Milk: The results of the screening test or confirmatory test shall be recorded on the official records of the dairy farm and a copy of the results sent to the milk producer.

When a warning letter has been sent, because of excessively high somatic cell counts, an official inspection of the dairy should be made by regulatory personnel or certified industry personnel. This inspection should be made during milking time.

1. 6a. Milk (Non-Goat): Any of the following confirmatory or screening tests shall be used: Direct Microscopic Somatic Cell Counting Single Strip Procedure, Electronic Somatic Cell Counting or Flow Cytometry/Opto-Electronic Somatic Cell Counting.
2. 6b. Goat Milk: In addition to the above mentioned tests, the Wisconsin Mastitis Test or California Mastitis Test may be used for screening raw goat milk samples, to indicate a range of somatic cell levels, as long as the somatic cell standard for goat milk remains 1,000,000/mL. Laboratories using the Wisconsin Mastitis Test or California Mastitis Test for goat milk shall confirm samples of herd milk that exceeds 18mm, or a value of one (1), respectively.

Any of the following confirmatory or screening tests shall be used: Direct Microscopic Somatic Cell Counting Single Strip Procedure, Electronic Somatic Cell Counting or Flow Cytometry/Opto-Electronic Somatic Cell Counting. Pyronine Y-Methyl green stain or "New York modification" shall be used in the confirmatory test for Direct Microscopic Somatic Cell counts in goat milk.

7. American Public Health Association (APHA), Association of Official Analytical Chemists (AOAC), or Electronic Phosphatase Tests: The phosphatase test is an index of the efficiency of the pasteurization process. In the event the laboratory phosphatase test is positive, the cause shall be determined immediately. Where the cause is improper pasteurization, it shall be corrected. When a laboratory phosphatase test is positive, or if any doubt should arise as to the compliance of the equipment, standards or methods outlined in Section 7, Item 16p, the Regulatory Agency should immediately conduct field phosphatase test at the milk plant. (Refer to Appendix G.)
8. Vitamin testing shall be performed using test methods acceptable to FDA or other official methodologies, which give statistically equivalent results to the FDA methods.
9. Any other tests, which have been approved by FDA to be equally accurate, precise and practical.
10. All standards used in the development and use of drug residue detection methods designed for Grade "A" PMO monitoring programs will be referenced to a United States Pharmacopeia (USP) standard when available. When a USP standard is not available, then the original method must define the standard to be used.
11. Procedural or reagent changes for official tests must be submitted to FDA for acceptance prior to being used by certified NCIMS milk laboratories.

SAMPLING PROCEDURES: SMEDP contains guidance for sampling of milk and milk products. (Refer to Appendix G. for a reference to drug residues in milk and the conditions under which a positive phosphatase reaction may be encountered in properly pasteurized milk or cream. Refer to Appendix B. for reference to farm bulk milk hauling programs regarding training, licensing/permitting, routine inspection and the evaluation of sampling procedures.)

When samples of raw milk for pasteurization are taken at a milk plant prior to pasteurization, they shall be drawn following adequate agitation from randomly selected storage tanks. All counts and temperatures should be recorded on a milk-ledger form as soon as reported by the laboratory. A computer or other information retrieval system may be used.

NOTE: Milk from animals not currently in the Grade "A" PMO may be labeled as Grade "A" and IMS listed upon FDA's acceptance of validated Grade "A" PMO, Section 6 and Appendix N. test methods for the animal to be added.

SECTION 7. STANDARDS FOR GRADE "A" MILK AND MILK PRODUCTS

All Grade "A" raw milk or milk products for pasteurization, ultra-pasteurization, or aseptic processing and all Grade "A" pasteurized, ultra-pasteurized or aseptically processed milk and milk products, shall be produced, processed, manufactured and pasteurized, ultra-pasteurized, or aseptically processed to conform to the following chemical, physical, bacteriological and temperature standards and the sanitation requirements of this Section.

No process or manipulation other than pasteurization, ultra-pasteurization or aseptic processing; processing methods integral therewith; and appropriate refrigeration shall be applied to milk and milk products for the purpose of removing or deactivating microorganisms. Provided, that in the bulk shipment of cream, nonfat (skim) milk or reduced fat or low fat milk, the heating of the raw milk, one time, to temperatures greater than 52°C (125°F) but less than 72°C (161°F), for separation purposes, is permitted when the resulting bulk shipment(s) of cream, nonfat (skim) milk or reduced fat or low fat milk are labeled heat-treated. In the case of heat-treated cream, the cream may be further heated to less than 75°C (166°F) in a continuing heating process and immediately cooled to 7°C (45°F) or less when necessary for enzyme deactivation (such as lipase reduction) for a functional reason.

Milk plants, receiving stations and transfer stations participating in the NCIMS HACCP Program, shall also comply with the requirements of Appendix K. of this Ordinance.

Whey shall be from cheese made from Grade "A" raw milk for pasteurization as provided in this Ordinance.

Buttermilk shall be from butter made from Grade "A" cream, which has been pasteurized prior to use in accordance with Item 16p of this Ordinance. Provided, that this requirement shall not be construed as barring any other heat treatment process which has been recognized by the FDA to be equally efficient in the destruction of staphylococcal organisms and which is approved by the Regulatory Agency.

Buttermilk and whey used in the manufacture of Grade "A" milk and milk products shall be produced in a milk/cheese plant that complies with Items 1p, 2p, 3p, 4p, 5p 6p, 7p 8p, 9p, 10p, 11p, 12p, 13p, 14p, 15p, 17p, 20p, 21p and 22p as provided in this Ordinance.

Whey shall be from:

1. Cheese made from Grade "A" raw milk for pasteurization, which has been pasteurized prior to use, in accordance with Item 16p of this Ordinance, or
2. Cheese made from Grade "A" raw milk for pasteurization, which has been heat-treated to a temperature of at least 64°C (147°F) and held continuously at that temperature for at least twenty one (21) seconds or to at least 68°C (153°F) and held continuously at that temperature for at least fifteen (15) seconds, in equipment meeting the pasteurization requirements provided for in this Ordinance. Provided, that this requirement shall not be construed as barring any other heat treatment process which has been recognized by the FDA to be equally efficient in the destruction of staphylococcal organisms and which is approved by the Regulatory Agency.

Table 1. Chemical, Physical, Bacteriological, and Temperature Standards

GRADE "A" RAW MILK AND MILK PRODUCTS FOR PASTEURIZATION, ULTRA-PASTEURIZATION OR ASEPTIC PROCESSING	Temperature	Cooled to 10°C (50°F) or less within four (4) hours or less, of the commencement of the first milking, and to 7°C (45°F) or less within two (2) hours after the completion of milking. Provided, that the blend temperature after the first milking and subsequent milkings does not exceed 10°C (50°F).
	Bacterial Limits	Individual producer milk not to exceed 100,000 per mL prior to commingling with other producer milk. Not to exceed 300,000 per mL as commingled milk prior to pasteurization.
	Drugs	No positive results on drug residue detection methods as referenced in Section 6 - Laboratory
	Somatic Cell Count*.	Individual producer milk not to exceed 750,000 per mL.
GRADE "A" PASTEURIZED MILK AND MILK PRODUCTS AND BULK SHIPPED HEAT-TREATED MILK PRODUCTS	Temperature	Cooled to 7°C (45°F) or less and maintained thereat.
	Bacterial Limits**	20,000 per mL, or gm.***
	Coliform****	Not to exceed 10 per mL. Provided, that in the case of bulk milk transport tank shipments, shall not exceed 100 per mL.
	Phosphatase*****	Less than 350 milliunits/L for fluid products and other milk products by the Fluorometer or Charm ALP or equivalent.
	Drugs**.	No positive results on drug residue detection methods as referenced in Section 6 - Laboratory Techniques which have been found to be acceptable for use with pasteurized and heat-treated milk and milk products
GRADE "A" PASTEURIZED CONCENTRATED (CONDENSED) MILK AND MILK PRODUCTS	Temperature..	Cooled to 7°C (45°F) or less and maintained thereat unless drying is commenced immediately after condensing.
	Coliform.	Not to exceed 10 per gram. Provided, that in the case of bulk milk transport tank shipments shall not exceed 100 per ml.
GRADE "A" ASEPTICALLY PROCESSED MILK AND MILK	Temperature.	None.
	Bacterial Limits..	Refer to 21 CFR 113. 3(e)(1)*****

PRODUCTS	Drugs**.	No positive results on drug residue detection methods as referenced in Section 6 - Laboratory Techniques that have been found to be acceptable for use with aseptically processed milk and milk products.
GRADE "A" NONFAT DRY MILK		No More Than:
	Butterfat.	1.25%
	Moisture	4.00%
	Titratable Acidity..	0.15%
	Solubility Index..	1.25mL.
	Bacterial Estimate.	30,000 per gram
	Coliform	10 per gram
	Scorched Particles disc B.	15.0 per gram
GRADE "A" WHEY FOR CONDENSING	Temperature.	Maintained at a temperature of 45°F (7°C) or less, or 63°C (145°F) or greater, except for acid-type whey with a titratable acidity of 0.40% or above, or a pH of 4.6 or below.
GRADE "A" PASTEURIZED CONDENSED WHEY AND WHEY PRODUCTS	Temperature	Cooled to 7°C (45°F) or less during crystallization, within 48 hours of condensing.
	Coliform Limit.	Not to exceed 10 per gram
GRADE "A" DRY WHEY, GRADE "A" DRY WHEY PRODUCTS, GRADE "A" DRY BUTTERMILK, AND GRADE "A" DRY BUTTERMILK PRODUCTS	Coliform Limit	Not to exceed 10 per gram

- Goat Milk 1,000,000 per mL
 - ** Not applicable to acidified or cultured products.
 - *** Results of the analysis of dairy products which are weighed in order to be analyzed will be reported in # per gm. (Refer to the current edition of the SMEDP)
 - **** Not applicable to bulk shipped heat-treated milk products.
 - ***** Not applicable to bulk shipped heat-treated milk products; UP products that have been thermally processed at or above 138°C (280°F) for at least two (2) seconds to produce a product which has an extended shelf life (ESL) under refrigerated conditions; and condensed products.
 - ***** 21 CFR 113.3(e)(1) contains the definition of "COMMERCIAL STERILITY".

SECTION 8:

Standards for Grade "A" Raw Milk for Pasteurization, Ultra-pasteurization or Aseptic Processing

ITEM 1r. ABNORMAL MILK

Lactating animals which show evidence of the secretion of milk with abnormalities in one (1) or more quarters, based upon bacteriological, chemical or physical examination, shall be milked last or with separate equipment and the milk shall be discarded. Lactating animals producing contaminated milk, that is, lactating animals which have been treated with, have consumed chemical, medicinal or radioactive agents, which are capable of being secreted in the milk and which, in the judgment of the Regulatory Agency, may be deleterious to human health, shall be milked last or with separate equipment and the milk disposed of as the Regulatory Agency may direct. (For applicability to Automatic Milking Installations (AMIs), refer to Appendix Q.)

PUBLIC HEALTH REASON

The health of lactating animals is a very important consideration because a number of diseases of lactating animals, including salmonellosis, staphylococcal infection and streptococcal infection, may be transmitted to man through the medium of milk. The organisms of most of these diseases may get into the milk either directly from the udder or indirectly through infected body discharges which may drop, splash or be blown into the milk.

Bovine mastitis is an inflammatory and, generally, highly communicable disease of the bovine udder. Usually, the inciting organism is a streptococcus of bovine origin (type B), but a staphylococcus or other infectious agent often causes the disease. Occasionally lactating animal's udders become infected with hemolytic streptococci of human origin, which may result in milk borne epidemics of scarlet fever or septic sore throat. The toxins of staphylococci and possibly other organisms in milk may cause severe gastroenteritis. Some of these toxins are not destroyed by pasteurization.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Milk from lactating animals being treated with medicinal agents, who are capable of being secreted in the milk, is not offered for sale for such a period as is recommended by the attending veterinarian or as indicated on the package label of the medicinal agent.
2. Milk from lactating animals treated with or exposed to insecticides, not approved for use on dairy animals by the EPA, is not offered for sale.
3. The Regulatory Agency requires such additional tests for the detection of milk with abnormalities, as they deem necessary.
4. Bloody, stringy, off-colored milk, or milk that is abnormal to sight or odor, is so handled and disposed of as to preclude the infection of other lactating animals and the contamination of milk utensils.
5. Lactating animals secreting milk with abnormalities are milked last or in separate equipment, which effectively prevents the contamination of the wholesome supply. Milking equipment

- used on animals with abnormalities in their milk is maintained clean to reduce the possibility of re-infecting or cross infection of the dairy animals.
6. Equipment, utensils and containers used for the handling of milk with abnormalities are not used for the handling of milk to be offered for sale, unless they are first cleaned and effectively sanitized.
 7. Processed animal waste derivatives, used as a feed ingredient for any portion of the total ration of the lactating dairy animal, have been:
 - a. Properly processed in accordance with at least those requirements contained in the Model Regulations for Processed Animal Wastes developed by the Association of American Feed Control Officials; and
 - b. Do not contain levels of deleterious substances, harmful pathogenic organisms or other toxic substances, which are secreted in the milk at any level, which may be deleterious to human health.
 8. Unprocessed poultry litter and unprocessed recycled animal body discharges are not fed to lactating dairy animals.

ITEM 2r. MILKING BARN, STABLE OR PARLOR - CONSTRUCTION

A milking barn, stable or parlor shall be provided on all dairy farms in which the milking herd shall be housed during milking time operations. (For applicability to AMIs, refer to Appendix Q.) The areas used for milking purposes shall:

1. Have floors constructed of concrete or equally impervious materials. Provided, convalescent (maternity) pens located in milking areas of stanchion-type barns may be used when they comply with the guidelines specified in Appendix C., III.
2. Have walls and ceilings, which are smooth, painted or finished in an approved manner; in good repair; and ceiling dust-tight.
3. Have separate stalls or pens for horses, calves and bulls, and not be overcrowded.
4. Be provided with natural and/or artificial light, well distributed, for day and/or night milking.
5. Provide sufficient air space and air circulation to prevent condensation and excessive odors.

PUBLIC HEALTH REASON

When milking is done elsewhere than in a suitable place provided for this purpose, the milk may become contaminated. Floors constructed of concrete or other impervious materials can be kept clean more easily than floors constructed of wood, earth or similar materials and are; therefore, more apt to be kept clean. Painted, or properly finished walls and ceilings encourage cleanliness. Tight ceilings reduce the likelihood of dust and extraneous material getting into the milk. Adequate lighting makes it more probable that the barn will be clean and that the lactating animals will be milked in a sanitary manner.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. A milking barn, stable or parlor is provided on all dairy farms.

2. Gutters, floors and feed troughs are constructed of good quality concrete or equally impervious material. Floors shall be easily cleaned, brushed surfaces permitted; be graded to drain; maintained in good repair; and free of excessive breaks or worn areas that may create pools.
3. Gravity flow manure channels in milking barns, if used, shall be constructed in accordance with the specifications of Appendix C., II. or acceptable to the Regulatory Agency.
4. Stall barns, when used with gutter grates over manure storage pits, are designed and constructed in accordance with the specifications of Appendix C., IV. or acceptable to the Regulatory Agency.
5. Walls and ceilings are finished with wood, tile, smooth-surfaced concrete, cement plaster, brick or other equivalent materials with light colored surfaces. Walls, partitions, doors, shelves, windows and ceilings shall be kept in good repair; and surfaces shall be refinished whenever wear or discoloration is evident.
Whenever feed is stored overhead, ceilings shall be constructed to prevent the sifting of chaff and dust into the milking barn, stable or parlor. If a hay opening is provided from a loft, which is open into the milking portion of the barn, such openings shall be provided with a dust-tight door, which shall be kept closed during milking operations.
6. Bull pens, maternity, calf and horse stalls are partitioned from the milking portion of the barn. Such portions of the barn that are not separated by tight partitions shall comply with all the requirements of this Item.
7. Overcrowding is not evidenced by the presence of calves, lactating animals or other barnyard animals in walks or feed alleys. Inadequate ventilation and excessive odors may also be evidence of an overcrowded barn.
8. The milking barn is provided with natural and/or artificial light to insure that all surfaces and particularly the working areas will be plainly visible. The equivalent of at least ten (10) foot-candles (110 lux) of light in all working areas shall be provided.
9. Air circulation is sufficient to minimize odors and to prevent condensation upon walls and ceilings.
10. A dust-tight partition, provided with doors that are kept closed, except when in actual use, shall separate the milking portion of the barn from any feed room or silo in which feed is ground or mixed, or in which sweet feed is stored.

When conditions warrant, the Regulatory Agency may approve a barn without four walls extending from floor to roof, or a shed-type barn provided the requirement of Item 3r, prohibiting animals and fowl from entering the barn is satisfied.

ITEM 3r. MILKING BARN, STABLE OR PARLOR - CLEANLINESS

The interior shall be kept clean. Floors, walls, ceilings, windows, pipelines and equipment shall be free of filth and/or litter and shall be clean. Swine and fowl shall be kept out of the milking area.

Feed shall be stored in a manner that will not increase the dust content of the air or interfere with the cleaning of the floor. (For applicability to AMIs, refer to Appendix Q.)

Surcingles, or belly straps, milk stools and antikickers shall be kept clean and stored above the floor.

PUBLIC HEALTH REASON

A clean interior reduces the chances of contamination of the milk or milk pails during milking. The presence of other animals increases the potential for the spread of disease. Clean milk stools and surcingles reduce the likelihood of contamination of the milker's hands between the milking of one (1) lactating animal and the milking of another.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. The interior of the milking barn, stable or parlor is kept clean.
2. Leftover feed in feed mangers appears fresh and is not wet or soggy.
3. The bedding material, if used, does not contain more manure than has accumulated since the previous milking.
4. Outside surfaces of pipeline systems located in the milking barn, stable or parlor are reasonably clean.
5. Gutter cleaners are reasonably clean.
6. All pens, calf stalls and bullpens, if not separated from the milking barn, stable or parlor, are clean.
7. Swine and fowl are kept out of the milking area.
8. Milk stools are not padded and are constructed to be easily cleaned. Milk stools, surcingles and antikickers are kept clean and are stored above the floor in a clean place in the milking barn, stable, parlor or milk house, when not in use.
9. Gravity flow manure channels in milking barns, if used, shall be maintained in accordance with Appendix C., II.
10. Stall barns, when used with gutter grates over manure storage pits, are operated and maintained in accordance with the specifications of Appendix C., IV.

The method of cleaning is immaterial. Dairy operators whose barns are provided with water under pressure should scrub the floors after each milking with a stiff-bristled brush. In barns in which water under pressure is not available, the floors may be brushed-dry and limed. In the latter event, care should be exercised to prevent caking of the lime. When lime or phosphate is used, it shall be spread evenly on the floor as a thin coating. If clean floors are not maintained by this method, the sanitarian should require cleaning with water.

ITEM 4r. COWYARD

The cow yard shall be graded and drained and shall have no standing pools of water or accumulations of organic wastes. Provided, that in loafing or lactating animal-housing areas, lactating animal droppings and soiled bedding shall be removed, or clean bedding added, at sufficiently frequent intervals to prevent the soiling of the lactating animal's udder and flanks. Cooling ponds shall be allowed provided they are constructed and maintained in a manner that does not result in the visible soiling of flanks, udders, bellies and tails of lactating animals exiting the pond. Waste feed shall not be allowed to accumulate. Manure packs shall be properly drained and shall provide a reasonably firm footing. Swine shall be kept out of the cow yard.

PUBLIC HEALTH REASON

The cow yard is interpreted to be that enclosed or unenclosed area in which the lactating animals are apt to congregate, approximately adjacent to the barn, including animal-housing areas. This area is; therefore, particularly apt to become filthy with manure droppings, which may result in the soiling of the lactating animal's udders and flanks. The grading and drainage of the cow yard, as far as is practicable, is required because wet conditions are conducive to fly breeding and make it difficult to keep manure removed and the lactating animals clean. If manure and barn sweepings are allowed to accumulate in the cow yard, fly breeding will be promoted, and the lactating animals, because of their habit of lying down, will be more apt to have manure-soiled udders. Lactating animals should not have access to piles of manure, in order to avoid the soiling of udders and the spread of diseases among dairy animals.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. The cow yard, which is the enclosed or unenclosed area adjacent to the milking barn in which the lactating animals may congregate, including animal-housing areas and feed lots, is graded and drained, depressions and soggy areas are filled, and lactating animal's lanes are reasonably dry.
2. Approaches to the barn door and the surroundings of stock watering and feed stations are solid to the footing of the animals.
3. Wastes from the barn or milk house are not allowed to pool in the cow yard. Cow yards, which are muddy due to recent rains, should not be considered as violating this Item.
4. Manure, soiled bedding and waste feed are not stored or permitted to accumulate therein in such a manner as to permit the soiling of cow's udders and flanks. Animal-housing areas, stables without stanchions, such as loose-housing stables, pen stables, resting barns, holding barns, loafing sheds, wandering sheds and free-stall housing, shall be considered as part of the cow yard. Manure packs shall be solid to the footing of the animals. (Refer to Appendix C.)
5. Cow yards are kept reasonably free of animal droppings. Animal droppings shall not be allowed to accumulate in piles that are accessible to the animals.

ITEM 5r. MILK HOUSE - CONSTRUCTION AND FACILITIES

A milk house of sufficient size shall be provided, in which the cooling, handling and storing of milk and the washing, sanitizing and storing of milk containers and utensils shall be conducted, except as provided for in Item 12r of this Section.

The milk house shall be provided with a smooth floor constructed of concrete or equally impervious material; graded to drain; and maintained in good repair. Liquid waste shall be disposed of in a sanitary manner. Floor drains shall be accessible and shall be trapped if connected to a sanitary sewer system.

The walls and ceilings shall be constructed of smooth material; be in good repair; and be well painted, or finished in an equally suitable manner.

The milk house shall have adequate natural and/or artificial light and be well ventilated.

The milk house shall be used for no other purpose than milk house operations. There shall be no direct opening into any barn, stable or parlor or into a room used for domestic purposes. Provided, that a direct opening between the milk house and milking barn, stable or parlor is permitted when a tight-fitting, self-closing, solid door(s) hinged to be single or double acting is provided. Screened vents in the wall between the milk house and a breezeway, which separates the milk house from the milking parlor, are permitted, provided animals are not housed within the milking facility.

Water under pressure shall be piped into the milk house.

The milk house shall be equipped with a two (2) compartment wash vat and adequate hot water heating facilities.

A transportation tank may be used for the cooling and/or storage of milk on the dairy farm. Such tank shall be provided with a suitable shelter for the receipt of milk. Such shelter shall be adjacent to, but not a part of, the milk house and shall comply with the requirements of the milk house with respect to construction items: lighting; drainage; insect and rodent control; and general maintenance. In addition, the following minimum criteria shall be met:

1. An accurate, accessible temperature recording device shall be installed in the milk line downstream from an effective cooling device, which cools the milk to 7°C (45°F) or less. An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used to check the recording thermometer during the regulatory inspection and the results recorded on the recording chart.
2. The milk shall be sampled at the direction of the Regulatory Agency in a manner so as to preclude contaminating the milk tank truck or sample, by a permitted milk sample collector.
3. The milk tank truck shall be effectively agitated in order to collect a representative sample.

When the Regulatory Agency determines conditions exist whereby the milk tank truck can be adequately protected and sampled without contamination, a shelter need not be provided if the following minimum criteria are met:

1. The milk hose connection is accessible to, and made from within, the milk house. The milk hose connection to the milk tank truck is completely protected from the outside environment at all times.
2. To assure continued protection of the milk, the milk tank truck manhole must be sealed after the truck has been cleaned and sanitized.
3. The milk tank truck shall be washed and sanitized at the permitted milk plant, receiving station, or transfer station receiving the milk, or at a permitted milk tank truck cleaning facility.
4. An accurate, accessible temperature-recording device shall be installed in the milk line downstream from an effective cooling device, which cools the milk to 7°C (45°F) or less. An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used to check the recording thermometer during the regulatory inspection and the results recorded on the recording chart.
5. The milk shall be sampled at the direction of the Regulatory Agency, in a manner so as to preclude contaminating the milk tank truck or sample, by a permitted milk sample collector.

The milk in the milk tank truck shall be effectively agitated in order to collect a representative sample.

6. The milk tank truck shall be parked on a self-draining concrete or equally impervious surface during filling and storage.

PUBLIC HEALTH REASON

Unless a suitable, separate place is provided for the cooling, handling and storing of milk and for the washing, sanitizing and storage of milk utensils, the milk or the utensils may become contaminated. Construction, which permits easy cleaning, promotes cleanliness. A well-drained floor of concrete or other impervious material promotes cleanliness. Ample light promotes cleanliness, and proper ventilation reduces the likelihood of odors and condensation. A milk house that is separated from the barn, stable or parlor and the living quarters provides a safeguard against the exposure of milk and milk equipment and utensils to contamination.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. A separate milk house of sufficient size is provided for the cooling, handling and storing of milk and the washing, sanitizing and storing of milk containers and utensils, except as provided for in Item 12r of this Section.
2. The floors of all milk houses are constructed of good quality concrete (float finish permissible), or equally impervious tile, or brick laid closely with impervious material, or metal surfacing with impervious joints or other material the equivalent of concrete and maintained free of breaks, depressions and surface peelings.
3. The floor slopes to drain so that there are no pools of standing water. The joints between the floor and the walls shall be watertight.
4. Liquid wastes are disposed of in a sanitary manner. All floor drains are accessible and are trapped if connected to a sanitary sewer.
5. Walls and ceilings are constructed of smooth dressed lumber or similar material; well painted with a light-colored washable paint; and are in good repair. Surfaces and joints shall be tight and smooth. Sheet metal, tile, cement block, brick, concrete, cement plaster or similar materials of light color may be used and the surfaces and joints shall be smooth.
6. A minimum of twenty (20) foot-candles (220 lux) of light is provided at all working areas from natural and/or artificial light for milk house operations.
7. The milk house is adequately ventilated to minimize condensation on floors, walls, ceilings and clean utensils.
8. Vents, if installed, and lighting fixtures are installed in a manner to preclude the contamination of bulk milk tanks or clean utensil storage areas.
9. The milk house is used for no other purpose than milk house operations.
10. There is no direct opening into any barn, stable or parlor or room used for domestic purposes. Except that an opening between the milk house and milking barn, stable or parlor is permitted when a tight-fitting, self-closing, solid door(s) hinged to be single or double acting is provided. Except that screened vents are permitted in the wall between the milk house and a breezeway,

which separates the milk house from the milking parlor, provided animals are not housed within the milking facility.

11. A vestibule, if used, complies with the applicable milk house construction requirements.
12. The transfer of milk from a bulk milk tank to a bulk milk pickup tanker is through a hose port located in the milk house wall. The port shall be fitted with a tight door, which shall be in good repair. It shall be kept closed except when the port is in use. An easily cleanable surface shall be constructed under the hose port, adjacent to the outside wall and sufficiently large to protect the milk hose from contamination.
Provided, milk can be transferred from a bulk milk tank to a bulk milk pickup tanker by stubbing the milk transfer and associated mechanically cleaned lines outside the milk house wall, provided:
 - a. A concrete slab of adequate size, to protect the transfer hose, shall be provided under the stubbed sanitary milk and mechanically cleaned lines.
 - b. The outside wall of the milk house, where the sanitary piping and concrete slab are located shall be properly maintained and kept in good repair.
 - c. The sanitary piping, stubbed outside the milk house, shall be properly sloped to assure complete drainage and the ends of the piping, which are located outside, shall be capped when the transfer hose is disconnected.
 - d. After the completion of milk transfer, the milk lines and transfer hose shall be properly mechanically cleaned.
 - e. After the mechanical cleaning process has been completed; the transfer hose shall be disconnected, drained and stored in the milk house. Proper storage of the transfer hose includes capping the ends and storing the entire hose up off the floor. The sanitary piping outside the milk house shall be capped at all times, except when transferring milk or being mechanically cleaned. When the caps are not being used, they shall be properly cleaned and sanitized after each use and stored in the milk house to protect them from contamination. A transfer hose manufactured with permanent hose end fittings, attached in such a manner that will assure a crevice-free joint between the hose and the fitting, may be stored outside of the milk house, provided it is mechanically cleaned; the stubbed piping and hose length are of sufficient design to allow complete drainage after cleaning and sanitizing; and the hose remains connected to the stubbed piping when not in use.
 - f. Means shall be provided to sanitize the milk-contact surfaces of the transfer hose and bulk milk pickup tanker fittings prior to the connection of the transfer hose to the bulk milk pickup tanker.
 - g. At all times, the bulk milk pickup tanker manhole openings(s) shall remain closed, except for brief periods for sampling and examination when environmental conditions permit.
13. Water under pressure is piped into the milk house.
14. Each milk house is provided with facilities for heating water in sufficient quantity and to such temperatures for the effective cleaning of all equipment and utensils. (Refer to Appendix C.)
15. The milk house is equipped with a wash-and-rinse vat having at least two (2) compartments. Each compartment must be of sufficient size to accommodate the largest utensil or container used. The upright wash vat for milk pipelines and milk machines may be accepted as one (1) part of the two (2) compartment vat. Provided, that the stationary wash rack, in or on the vat,

and the milking machines inflations and appurtenances are completely removed from the vat during the washing, rinsing and/or sanitizing of other utensils and equipment. Where mechanical cleaning/recirculated systems eliminate the need for hand washing of equipment, the presence of the second wash vat compartment may be optional, if so determined by the Regulatory Agency, on an individual farm basis.

16. A transportation tank, with or without overhead protection, may be used for cooling and/or storing milk on a dairy farm. If a suitable shelter is provided for a transportation truck, used for cooling and/or storing milk, such shelter shall be adjacent to, but not a part of, the milk house and shall comply with the prerequisites of the milk house with respect to construction items: lighting; drainage; insect and rodent control; and general maintenance. (Refer to Appendix C. for suggested plans and information on size, construction, operation and maintenance of milk houses)
17. In addition, the following minimum criteria shall be met:
 - a. An accurate, accessible temperature-recording device shall be installed in the milk line downstream from an effective cooling device that cools the milk to 7°C (45°F) or less. An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used to check the recording thermometer during the regulatory inspection and the results recorded on the recording chart.
 - b. The milk shall be sampled at the direction of the Regulatory Agency in a manner so as to preclude contaminating the milk tank truck or sample, by an acceptable milk sample collector.
 - c. The milk tank truck shall be effectively agitated in order to collect a representative sample.

When the Regulatory Agency determines conditions exist whereby the milk tank truck can be adequately protected and sampled without contamination, a shelter need not be provided if the following minimum criteria are met:

- a. The milk hose connection is accessible to, and made from within, the milk house. The milk hose connection to the milk tank truck is completely protected from the outside environment at all times.
- b. To assure continued protection of the milk, the milk tank truck manhole must be sealed after the truck has been cleaned and sanitized.
- c. The milk tank truck shall be washed and sanitized at the permitted milk plant, receiving station or transfer station receiving the milk or at a permitted milk tank truck cleaning facility.
- d. An accurate, accessible temperature-recording device shall be installed in the milk line downstream from an effective cooling device, which cools the milk to below 7°C (45°F). An indicating thermometer shall be installed as close as possible to the recording device for verification of recording temperatures. This indicating thermometer shall comply with all applicable requirements in Appendix H. This thermometer shall be used to check the recording thermometer during the regulatory inspection and the results recorded on the recording chart.
- e. The milk shall be sampled at the direction of the Regulatory Agency, in a manner so as to preclude contaminating the milk tank truck or sample, by a permitted milk sample collector. The milk in the milk tank truck shall be effectively agitated in order to collect a representative sample.

- f. The milk tank truck shall be parked on a self-draining concrete or equally impervious surface during filling and storage.

ITEM 6r. MILK HOUSE - CLEANLINESS

The floors, walls, ceilings, windows, tables, shelves, cabinets, wash vats, non-product-contact surfaces of milk containers, utensils and equipment and other milk house equipment shall be clean. Only articles directly related to milk house activities shall be permitted in the milk house. The milk house shall be free of trash, animals and fowl.

PUBLIC HEALTH REASON

Cleanliness in the milk house reduces the likelihood of contamination of the milk.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. The milk house structure, equipment and other milk house facilities, used in its operation or maintenance, are clean at all times.
2. Incidental articles such as desks, refrigerators, and storage cabinets may be in the milk house, provided they are kept clean and ample space is available to conduct the normal operations in the milk house and will not cause contamination of the milk.
3. Vestibules, if provided, are kept clean.
4. Animals and fowl are kept out of the milk house.

ITEM 7r. TOILET

Every dairy farm shall be provided with one (1) or more toilets; conveniently located; properly constructed; operated; and maintained in a sanitary manner. The waste shall be inaccessible to insects and shall not pollute the soil surface or contaminate any water supply.

PUBLIC HEALTH REASON

The organisms of typhoid fever, dysentery and gastrointestinal disorders may be present in the body wastes of persons who have these diseases. In the case of typhoid fever, well persons (carriers) also may discharge the organisms in their body wastes. If a toilet is not fly-tight and so constructed as to prevent overflow, infection may be carried from the excreta to the milk, either by flies or through the pollution of ground water supplies or streams to which the lactating animals have access.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. There is at least one (1) flush toilet connected to a public sewer system, or to an individual sewage-disposal system, or a chemical toilet, earth pit privy or other type of privy. Such sewage systems shall be constructed and operated in accordance with the standards outlined in Appendix C., or when a Regulatory Agency has more effective standards designed specifically for that region, these standards may apply, provided, there is no mixing of animal and human waste.

2. A toilet or privy is convenient to the milking barn and the milk house. There shall be no evidence of human defecation or urination about the premises.
3. No privy opens directly into the milk house.
4. The toilet room, including all fixtures and facilities, is kept clean and free of insects and odors.
5. Where flush toilets are used, doors to toilet rooms are tight and self-closing. All outer openings in toilet rooms shall be screened or otherwise protected against the entrance of insects.
6. Vents of earth pits are screened.

ITEM 8r. WATER SUPPLY

Water for milk house and milking operations shall be from a supply properly located, protected and operated and shall be easily accessible, adequate and of a safe, sanitary quality.

PUBLIC HEALTH REASON

A dairy farm water supply should be accessible in order to encourage its use in ample quantity in cleaning operations; it should be adequate so that cleaning and rinsing will be thorough; and it should be of a safe, sanitary quality in order to avoid contamination of milk utensils.

A polluted water supply, used in the rinsing of dairy utensils and containers, may be more dangerous than a similar water supply that is used for drinking purposes only. Bacteria grow much faster in milk than in water and the severity of an attack of a given disease depends largely upon the size of the dose of disease organisms taken into the system. Therefore, a small number of disease organisms consumed in a glass of water from a polluted well may possibly result in no harm; whereas, if left in a milk utensil, which has been rinsed with the water, they may after several hours growth, in the milk, increase in such numbers as to cause disease when consumed.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. The water supply for milk house and milking operations is approved as safe by the State Water Control Authority and, in the case of individual water systems, complies with the specifications outlined in Appendix D, and the Bacteriological Standards outlined in Appendix G.
2. No cross-connection exists between a safe water supply and any unsafe or questionable water supply or any other source of pollution.
3. There are no submerged inlets through which a safe water supply may be contaminated.
4. The well or other source of water is located and constructed in such a manner that neither underground nor surface contamination from any sewerage systems, privy or other source of pollution can reach such water supply.
5. New individual water supplies and water supply systems, which have been repaired or otherwise become contaminated, are thoroughly disinfected before being placed in use. (Refer to Appendix D.) The supply shall be made free of the disinfectant by pumping to waste before any sample for bacteriological testing shall be collected.
6. All containers and tanks used in the transportation of water are sealed and protected from possible contamination. These containers and tanks shall be subjected to a thorough cleaning and a bacteriological treatment prior to filling with potable water to be used at the dairy farm.

- To minimize the possibility of contamination of the water during its transfer from the potable tanks to the elevated or groundwater storage at the dairy farm, a suitable pump, hose and fittings shall be provided. When the pump, hose and fittings are not being used, the outlets shall be capped and stored in a suitable dust-proof enclosure so as to prevent their contamination. The storage tank at the dairy farm shall be constructed of impervious material; provided with a dust and rainproof cover; and also provided with an approved vent and roof hatch. All new reservoirs or reservoirs which have been cleaned shall be disinfected prior to placing them into service. (Refer to Appendix D.)
7. Samples for bacteriological examination are taken upon the initial approval of the physical structure, based upon the requirements of this Ordinance; when any repair or alteration of the water supply system has been made; and at least every three (3) years. Provided, that water supplies with buried well casing seals, installed prior to the adoption of this Section, shall be tested at intervals no greater than six (6) months apart. Whenever such samples indicate either the presence of bacteria of the coliform group or whenever the well casing, pump or seal need replacing or repair, the well casing and seal shall be brought above the ground surface and shall comply with all other applicable construction criteria of this Section. Provided, that when water is hauled to the dairy farm, such water shall be sampled for bacteriological examination at the point of use and submitted to a laboratory at least four (4) times in separate months during any consecutive six (6) months. Bacteriological examinations shall be conducted in a laboratory acceptable to the Regulatory Agency. To determine if water samples have been taken at the frequency established in this Section, the interval shall include the designated period plus the remaining days of the month in which the sample is due.
 8. Current records of water test results shall be retained on file with the Regulatory Agency or as the Regulatory Agency directs.

ITEM 9r. UTENSILS AND EQUIPMENT - CONSTRUCTION

All multi-use containers, utensils and equipment used in the handling, storage or transportation of milk shall be made of smooth, nonabsorbent, corrosion-resistant, non-toxic materials, and shall be so constructed as to be easily cleaned. All containers, utensils and equipment shall be in good repair. Multiple-use woven material shall not be used for straining milk. All single-service articles shall have been manufactured, packaged, transported and handled in a sanitary manner and shall comply with the applicable requirements of Item 11p of this Section. Articles intended for single-service use shall not be reused.

Farm holding/cooling tanks, welded sanitary piping and transportation tanks shall comply with the applicable requirements of Items 10p and 11p of this Section.

PUBLIC HEALTH REASON

Milk containers and other utensils without flush joints and seams, without smooth, easily cleaned, and accessible surfaces, and not made of durable, non-corrodible material, are apt to harbor accumulations in which undesirable bacterial growth is supported. Single-service articles, which have not been manufactured and handled in a sanitary manner, may contaminate the milk.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All multi-use containers, utensils and equipment, which are exposed to milk or milk products, or from which liquids may drip, drain or be drawn into milk or milk products, are made of smooth impervious, nonabsorbent, safe materials of the following types:
 - a. Stainless steel of the American Iron and Steel Institute (AISI) 300 series; or
 - b. Equally corrosion-resistant, non-toxic metal; or
 - c. Heat-resistant glass; or
 - d. Plastic or rubber and rubber-like materials which are relatively inert, resistant to scratching, scoring, decomposition, crazing, chipping and distortion, under normal use conditions; are non-toxic, fat resistant, relatively nonabsorbent, relatively insoluble; do not release component chemicals or impart flavor or odor to the product; and which maintain their original properties under repeated use conditions.
2. Single-service articles have been manufactured, packaged, transported and handled in a sanitary manner and comply with the applicable requirements of Item 11p.
3. Articles intended for single-service use are not reused.
4. All containers, utensils and equipment are free of breaks and corrosion.
5. All joints in such containers, utensils and equipment are smooth and free from pits, cracks or inclusions.
6. Mechanically cleaned milk pipelines and return-solution lines are self-draining. If gaskets are used, they shall be self-positioning and of material meeting specifications described in 1.d. above, and shall be of such design, finish and application as to form a smooth, flush, interior surface. If gaskets are not used, all fittings shall have self-positioning faces designed to form a smooth, flush, interior surface. All interior surfaces of welded joints in pipelines shall be smooth and free of pits, cracks and inclusions.
7. Detailed plans for mechanically cleaned pipeline systems are submitted to the Regulatory Agency for written approval prior to installation. No alteration or addition shall be made to any milk pipeline system without prior written approval of the Regulatory Agency.
8. Strainers, if used, are of perforated metal design, or so constructed as to utilize single-service strainer media.
9. All milking machines, including heads, milk claws, milk tubing and other milk-contact surfaces can be easily cleaned and inspected. Pipelines, milking equipment and appurtenances, which require a screwdriver or special tool, shall be considered easily accessible for inspection, providing the necessary tools are available at the milk house. Milking systems shall not have components incorporated in the return solution lines, which by design do not comply with the criteria for product-contact surfaces. Some examples of these are:
 - a. Ball type plastic valves;
 - b. Plastic tees with barbed ridges to better grip the plastic or rubber hoses; and
 - c. The use of PVC water type piping for return solution lines.
10. Milk cans have umbrella-type lids.

11. Farm holding/cooling tanks, welded sanitary piping and transportation tanks comply with the applicable requirements of Items 10p and 11p of this Section.
12. During filling, flexible plastic/rubber hoses may be used between the fill valves of bottom fill and top fill bulk milk storage tanks, when needed for functional purposes. Such hoses shall be drainable, be as short as practical, have sanitary fittings, and be supported to maintain uniform slope and alignment. The end fittings of such hoses shall be permanently attached in such a manner that will assure a crevice-free joint between the hose and the fitting, which can be cleaned by mechanical means. The hoses shall be included as part of a mechanical cleaning system.
13. Transparent flexible plastic tubing (up to 150 feet in length) used in connection with milk transfer stations shall be considered acceptable if it meets the "3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-" and if it remains sufficiently clear that the interior surfaces can be properly inspected. Short lengths of flexible plastic tubing (8 feet or less) may be inspected for cleanliness by sight or by use of a "rod". The transparency or opacity of such tubing under this condition is not a factor in determining cleanliness.
14. AMIs shall comply with all applicable Grade "A" PMO requirements and/or 3-A standards.

NOTE: 3-A Sanitary Standards for dairy equipment are promulgated jointly by the Sanitary Standards Subcommittee of the Dairy Industry Committee, the Committee on Sanitary Procedure of the International Association for Food Protection and the Milk Safety Branch, Food and Drug Administration, Public Health Service, Center for Food Safety and Applied Nutrition, Department of Health and Human Services. Equipment manufactured in conformity with 3-A Sanitary Standards complies with the sanitary design and construction standards of this Ordinance.

ITEM 10r. UTENSILS AND EQUIPMENT - CLEANING

The product-contact surfaces of all multi-use containers, equipment and utensils used in the handling, storage or transportation of milk shall be cleaned after each usage.

PUBLIC HEALTH REASON

Milk cannot be kept clean or free of contamination if permitted to come into contact with unclean containers, utensils or equipment.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. There shall be a separate wash manifold for all mechanically cleaned milk pipelines in all new or extensively remodeled facilities.
2. The product-contact surface of all multi-use containers, equipment and utensils used in the handling, storage or transportation of milk are cleaned after each milking or once every twenty-four (24) hours for continuous operations.
3. There shall be no partial removal of milk from milk storage/holding tanks by the bulk milk hauler/sampler, except partial pickups may be permitted when the milk storage/holding tank is equipped with a seven (7) day recording device complying with the specifications of Appendix H. or other recording device acceptable to the Regulatory Agency, provided the milk storage/holding tank shall be clean and sanitized when empty and shall be emptied at least

every seventy-two (72) hours. In the absence of a temperature-recording device, partial pickups may be permitted as long as the milk storage/holding tank is completely empty, clean and sanitized prior to the next milking. In the event of an emergency situation, such as inclement weather, natural disaster, etc., a variance may be permitted at the discretion of the Regulatory Agency.

ITEM 11r. UTENSILS AND EQUIPMENT - SANITIZATION

The product-contact surfaces of all multi-use containers, equipment and utensils used in the handling, storage or transportation of milk shall be sanitized before each usage.

PUBLIC HEALTH REASON

Mere cleaning of containers, equipment and utensils does not insure the removal or destruction of all disease organisms that may have been present. Even very small numbers remaining may grow to dangerous proportions, since many kinds of disease bacteria grow rapidly in milk. For this reason, all milk containers, utensils and equipment must be treated with an effective sanitizer before each usage.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

All product-contact surfaces of multi-use containers, utensils and equipment used in the handling, storage or transportation of milk are sanitized before each usage by one of the following methods, or by any method which has been demonstrated to be equally effective:

1. Complete immersion in hot water at a temperature of at least 77°C (170°F) for at least five (5) minutes; or exposure to a flow of hot water at a temperature of at least 77°C (170°F), as determined by the use of a suitable accurate thermometer, at the outlet, for at least five (5) minutes.
2. Certain chemical compounds are effective for the sanitization of milk utensils, containers, and equipment. These are contained in 21 CFR 178.1010 and shall be used in accordance with label directions. (Refer to Appendix F. for further discussion of approved sanitizing procedures.)

ITEM 12r. UTENSILS AND EQUIPMENT - STORAGE

All containers, utensils and equipment used in the handling, storage or transportation of milk, unless stored in sanitizing solutions, shall be stored to assure complete drainage and shall be protected from contamination prior to use. Provided, that pipeline milking equipment such as milker claws, inflations, weigh jars, meters, milk hoses, milk receivers, tubular coolers, plate coolers and milk pumps which are designed for mechanical cleaning and other equipment, as accepted by FDA, which meets these criteria, may be stored in the milking barn or parlor, provided this equipment is designed, installed and operated to protect the product and solution-contact surfaces from contamination at all times.

PUBLIC HEALTH REASON

Careless storage of milk containers, utensils and equipment, which previously have been properly treated, is apt to result in recontamination of such utensils, thus rendering them unsafe.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All milk containers, utensils and equipment, including milking machine vacuum hoses, are stored in the milk house in a sanitizing solution, or on racks, until used. Pipeline milking equipment such as milker claws, inflations, weight jars, milk hoses, milk receivers, tubular coolers, plate coolers and milk pumps which are designed for mechanical cleaning and other equipment, as accepted by FDA, which meets these criteria, may be mechanically cleaned, sanitized and stored in the milking barn or parlor, provided this equipment is designed, installed and operated to protect the product and solution contact surfaces from contamination at all times. Some of the parameters to be considered in determining protection are:
 - a. Proper location of equipment;
 - b. Proper drainage of equipment; and
 - c. Adequate and properly located lighting and ventilation.
2. The milking barn or parlor must be used only for milking. Concentrates may be fed in the barn during milking but the barn shall not be used for the housing of animals. When manual cleaning of product-contact surfaces is necessary, the cleaning shall be done in the milk house. Provided, in the case of a milking parlor that opens directly into an enclosed housing area, through a covered holding area, the holding area may be seasonally enclosed when:
 - a. There are no manure pit openings in the parlor, holding area or in the housing area close enough to affect the milking parlor.
 - b. The cattle holding and housing areas are maintained in good repair and reasonably clean.
 - c. With respect to dust, odors, rodents and insects, the entire area meets milking parlor standards and the parlor is free of evidence of birds.

In addition, construction and cleanliness items identified above shall be evaluated in the appropriate Ordinance Sections.

3. Means are provided to effect complete drainage of equipment when such equipment cannot be stored to drain freely.
4. Clean cans or other containers are stored in the milk house within a reasonable time after delivery to the dairy farm.
5. Strainer pads, parchment papers, gaskets and similar single-service articles are stored in a suitable container or cabinet, in a location convenient to their use, and protected against contamination.

ITEM 13r. MILKING - FLANKS, UDDERS AND TEATS

Milking shall be done in the milking barn, stable or parlor. The flanks, udders, bellies and tails of all milking lactating animals shall be free from visible dirt. All brushing shall be completed prior to milking. The udders and teats of all milking lactating animals shall be clean and dry before milking. Teats shall be treated with a sanitizing solution just prior to the time of milking and shall be dry before milking. Wet hand milking is prohibited.

PUBLIC HEALTH REASON

If milking is done elsewhere other than in a suitable place provided for this purpose, the milk may become contaminated. Cleanliness of the lactating animals is one of the most important factors affecting the bacterial count of the milk. Under usual farm conditions, lactating animals contaminate their udders by standing in polluted water or by lying down in the pasture or cow yard. Unless the udders and teats are clean and dry before milking, particles of filth or contaminated water are apt to drop or be drawn into the milk. Such contamination of the milk is particularly dangerous because manure may contain the organisms of brucellosis and tuberculosis, and polluted water may contain the organisms of typhoid fever and other intestinal diseases. Application of sanitizing solutions to the teats, followed by thorough drying just prior to the time of milking, has the advantage of giving an additional margin of safety with reference to such disease organisms as they are not removed by ordinary cleaning and it is helpful in the control of mastitis.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Milking is done in a milking barn, stable or parlor.
2. Brushing is completed prior to milking.
3. Flanks, bellies, tails and udders are clipped as often as necessary to facilitate cleaning of these areas and are free from dirt. The hair on the udders shall be of such length that it is not incorporated with the teat in the inflation during milking.
4. Udders and teats of all milking animals are clean and dry before milking. Teats shall be cleaned, treated with a sanitizing solution and dry just prior to milking. Provided that the sanitizing of teats shall not be required if the udder is dry and the teats have been thoroughly cleaned (not dry wiped) and dried (manually wiped dry) prior to milking. The determination of what constitutes a dry udder and cleaned and dried teats shall be made by the Regulatory Agency.

NOTE: Additional alternative udder preparation methods may also be used once they have been evaluated by FDA and found acceptable.

5. Wet hand milking is prohibited.

ITEM 14r. PROTECTION FROM CONTAMINATION

Milking and milk house operations, equipment and facilities shall be located and conducted to prevent any contamination of milk, containers, utensils and equipment. No milk shall be strained, poured, transferred or stored unless it is properly protected from contamination.

After sanitization, all containers, utensils and equipment shall be handled in such a manner as to prevent contamination of any product-contact surface.

Vehicles used to transport milk from the dairy farm to the milk plant, receiving station or transfer station shall be constructed and operated to protect their contents from sun, freezing and contamination. Such vehicles shall be kept clean, inside and out, and no substance capable of contaminating the milk shall be transported with the milk.

PUBLIC HEALTH REASON

Because of the nature of milk and its susceptibility to contamination by disease producing bacteria and other contaminants, every effort should be made to provide adequate protection for the milk at all times. This should include the proper placement of equipment so that work areas in the milking barn and milk house are not overcrowded. The quality of any air that is used for the agitation or movement of milk or is directed at a milk product-contact surface should be such that it will not contaminate the milk.

The effect of sanitization of equipment can be nullified if the equipment is not protected after sanitizing.

To protect milk during transportation, delivery vehicles must be properly constructed and operated.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Equipment and operations are so located within the milking barn and milk house as to prevent overcrowding and contamination of cleaned and sanitized containers, utensils and equipment by splash, condensation or manual contact.
2. During processing, pipelines and equipment, used to contain or conduct milk and milk products, shall be effectively separated from tanks or circuits containing cleaning and/or sanitizing solutions.
3. All milk that has overflowed, leaked, been spilled or improperly handled is discarded.
4. All product-contact surfaces of containers, utensils and equipment are covered or otherwise protected to prevent the access of insects, dust, condensation and other contamination. All openings, including valves and piping attached to milk storage tanks and milk tank trucks, pumps or vats, shall be capped or otherwise properly protected. Gravity type strainers used in the milk house do not have to be covered. Milk pipelines used to convey milk from pre-coolers to the bulk milk tank must be fitted with effective drip deflectors.
5. The receiving receptacle is raised above the floor, as on a dolly or cart, or placed at a distance from the lactating animals, to protect it against manure and splash when milk is poured and/or strained in the milking barn, stable or parlor. Such receptacle shall have a tight-fitting cover, which shall be closed, except when milk is being poured.
6. Each pail or container of milk is transferred immediately from the milking barn, stable or parlor to the milk house.
7. Pails, cans and other equipment containing milk are properly covered during transfer and storage.
8. Whenever air under pressure is used for the agitation or movement of milk, or is directed at a milk-contact surface, it is free of oil, dust, rust, excessive moisture, extraneous materials and odor, and shall otherwise comply with the applicable standards of Appendix H.
9. Sanitized product-contact surfaces, including bulk milk tank openings and outlets, are protected against contact with unsanitized utensils and equipment, hands, clothing, splash, condensation and other sources of contamination.
10. Any sanitized product-contact surface, which has been otherwise exposed to contamination, is again cleaned and sanitized before being used.

11. Vehicles used to transport milk from the dairy farm to the milk plant, receiving station or transfer station are constructed and operated to protect their contents from sun, freezing and contamination.
12. Vehicles have bodies with solid enclosures and tight, solid doors.
13. Vehicles are kept clean, inside and out.
14. No substance capable of contaminating milk is transported with the milk. (Refer to Items 10p and 11p and Appendix B. for information on the construction of milk tank trucks.)

ITEM 15r. DRUG AND CHEMICAL CONTROL

Cleaners and sanitizers shall be stored in properly identified, dedicated end-use containers.

Animal drugs and drug administration equipment shall be stored in such a way that milk, milking equipment, wash vats and hand sinks are not subject to contamination.

Animal drugs shall be properly labeled and segregated, lactating from non-lactating. Unapproved drugs shall not be used.

PUBLIC HEALTH REASON

Accidental misuse of cleaners or sanitizers can result in adulteration of the milk.

Animal drugs can result in adverse reactions in people sensitive to those residues and can contribute to the development of strains of drug resistant human pathogens.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Cleaners and sanitizers, used on dairy farms, shall be purchased in containers from the manufacturer or distributor, which properly identify the contents or, if bulk cleaners and sanitizers are transferred from the manufacturer's or distributor's container, that the transfer only occurs into a dedicated end-use container, which is specifically designed and maintained according to the manufacturer's specifications for that specific product. The label on the dedicated end-use container shall include the product name, chemical description, use directions, precautionary and warning statement, first aid instructions, container storage and maintenance instructions and the name and address of the manufacturer or distributor.
2. Equipment used to administer drugs is not cleaned in the wash vats and is stored so as not to contaminate the milk or milk-contact surfaces of equipment.
3. Drugs intended for treatment of non-lactating dairy animals are segregated from those drugs used for lactating animals. Separate shelves in cabinets, refrigerators or other storage facilities satisfy this Item.
4. Drugs shall be properly labeled to include the name and address of the manufacturer or distributor for OTC drugs, or veterinary practitioner dispensing the product for Rx and extra label use drugs.
5. Drug labels shall also include:
 - a. Directions for use, and prescribed withholding times;

- b. Cautionary statements, if needed; and
 - c. Active ingredient(s) in the drug product.
6. Unapproved and/or improperly labeled drugs are not used to treat dairy animals and are not stored in the milk house, milking barn, stable or parlor.
 7. Drugs are stored in such a manner that they cannot contaminate the milk or milk product-contact surfaces of the containers, utensils or equipment.

NOTE: Topical antiseptics and wound dressings, unless intended for direct injection into the teat, vaccines and other biologics, and dosage form vitamins and/or mineral products are exempt from labeling and storage requirements, except when it is determined that they are stored in such a manner that they may contaminate the milk or milk product-contact surfaces of containers, utensils or equipment.

ITEM 16r. PERSONNEL - HAND WASHING FACILITIES

Adequate hand washing facilities shall be provided, including a lavatory fixture with hot and cold, or warm running water, soap or detergent and individual sanitary towels, convenient to the milk house, milking barn, stable, parlor and flush toilet.

PUBLIC HEALTH REASON

Adequate hand washing facilities are essential to personal cleanliness and minimize the likelihood of contamination of the milk. Hand washing facilities are required in order to increase the assurance that milker's and bulk milk hauler/sampler's hands will be washed.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Hand washing facilities are located convenient to the milk house, milking barn, stable, parlor and flush toilet.
2. Hand washing facilities include soap or detergent, hot and cold, or warm running water, individual sanitary towels and a lavatory fixture. Utensil wash and rinse vats shall not be considered as hand washing facilities.

ITEM 17r. PERSONNEL - CLEANLINESS

Hands shall be washed clean and dried with an individual sanitary towel immediately before milking, before performing any milk house function and immediately after the interruption of any of these activities. Milkers and bulk milk hauler/samplers shall wear clean outer garments while milking or handling milk, milk containers, utensils, or equipment.

PUBLIC HEALTH REASON

The reasons for clean hands of the persons doing the milking are similar to those for the cleanliness of the lactating animal's udder. The milker's hands may have been exposed to contamination during the course of their normal duties on the farm and at milking time. Because the hands of all workers frequently come into contact with their clothing it is important that the clothes worn, during milking and the handling of milk, be clean.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Hands are washed, clean and dried with an individual sanitary towel immediately before milking; before performing any milk house function; and immediately after the interruption of any of these activities.
2. Milkers and bulk milk hauler/samplers wear clean outer garments while milking or handling milk containers, utensils or equipment.

ITEM 18r. RAW MILK COOLING

Raw milk for pasteurization shall be cooled to 10°C (50°F) or less within four (4) hours or less, of the commencement of the first milking, and to 7°C (45°F) or less, within two (2) hours after the completion of milking. Provided, that the blend temperature after the first milking and subsequent milkings does not exceed 10°C (50°F).

PUBLIC HEALTH REASON

Milk produced by disease-free lactating animals and under clean conditions usually contains relatively few bacteria immediately after milking. These can multiply to enormous numbers in a few hours unless the milk is cooled. However, when the milk is cooled quickly to 7°C (45°F) or less, there is only a slow increase in the numbers of bacteria.

Usually, the bacteria in milk are harmless, and if this were always true there would be no reason to cool milk, except to delay souring. There is; however, no way for the dairy operator or regulating officer to be absolutely sure that no disease bacteria have entered the milk, even though observance of the other Items of this Ordinance will greatly reduce this likelihood. The likelihood of transmitting disease is much increased when the milk contains large numbers of disease bacteria. Therefore, it is extremely important for milk to be cooled quickly, so that small numbers of bacteria, which may have entered the milk, will not multiply.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Raw milk for pasteurization shall be cooled to 10°C (50°F) or less within four (4) hours or less, of the commencement of the first milking, and to 7°C (45°F) or less, within two (2) hours after the completion of milking. Provided, that the blend temperature after the first milking and subsequent milkings does not exceed 10°C (50°F).
2. Recirculated cooling water, which is used in plate or tubular coolers or heat exchangers, is from a safe source and protected from contamination. Such water shall be tested semiannually and shall comply with the Bacteriological Standards of Appendix G.
3. All farm bulk milk tanks manufactured after January 1, 2000 shall be equipped with an approved temperature-recording device.
 - a. The recording device shall be operated continuously and be maintained in a properly functioning manner. Circular charts shall not overlap.
 - b. The recording device shall be verified every six (6) months and documented in a manner acceptable to the Regulatory Agency using an accurate (+/- 1°C (2°F))

thermometer that has been calibrated by a traceable standard thermometer, within the past six (6) months, with the results and date recorded and the thermometer being properly identified, or by using a traceable standard thermometer that has been calibrated within the last year.

- c. Recording thermometer charts shall be maintained on the premises for a period of a minimum of six (6) months and available to the Regulatory Agency.
- d. The recording thermometer should be installed in an area convenient to the milk storage tank and acceptable to the Regulatory Agency.
- e. The recording thermometer sensor shall be located to permit the registering of the temperature of the contents when the tank contains no more than ten percent (10%) of its calibrated capacity.
- f. The recording thermometer shall comply with the current technical specifications for tank recording thermometers.
- g. A recording thermometer and/or any other device that meets the intent of these Administrative Procedures and technical specifications and is acceptable to the Regulatory Agency can be used to monitor/record the bulk tank temperature.
- h. The recording thermometer charts shall properly identify the producer, date, and signature of the person removing the chart.

ITEM 19r. INSECT AND RODENT CONTROL

Effective measures shall be taken to prevent the contamination of milk, containers, utensils and equipment by insects and rodents and by chemicals used to control such vermin. Milk houses shall be free of insects and rodents. Surroundings shall be kept neat, clean and free of conditions, which might harbor or be conducive to the breeding of insects and rodents. Feed shall be stored in such a manner that it will not attract birds, rodents or insects.

PUBLIC HEALTH REASON

Proper manure disposal reduces the breeding of flies, which are considered capable of transmitting infection by physical contact or through excreta to milk or milk containers, utensils or equipment. Insects visit unsanitary places, they may carry pathogenic organisms on their bodies and they may carry living bacteria for as long as four (4) weeks within their bodies, and they may pass them on to succeeding generations by infecting their eggs. Effective screening tends to prevent the presence of flies, which are a public health menace. Flies may contaminate the milk with microorganisms, which may multiply and become sufficiently numerous to present a public health hazard. The surroundings of a dairy should be kept neat and clean in order to reduce insect and rodent harborages.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Surroundings are kept neat, clean and free of conditions, which might harbor or be conducive to the breeding of insects and rodents. During fly season, manure shall be spread directly on the fields; or stored for not more than four (4) days in a pile on the ground surface and then spread on the fields; or stored for not more than seven (7) days in an impervious-floored bin, or on an impervious-curbed platform and then spread; or stored in a tight-screened and trapped

- manure shed; or effectively treated with larvicides; or disposed of in any other manner which controls insect breeding.
2. Manure packs in loafing areas, stables without stanchions, pen stables, resting barns, wandering sheds and free-stall housing are properly bedded and managed to prevent insect breeding.
 3. Milk houses are free of insects and rodents.
 4. Milk houses are effectively screened or otherwise protected against the entrance of vermin.
 5. Outer milk house doors are tight and self-closing. Screen doors shall open outward.
 6. Effective measures are taken to prevent the contamination of milk, containers, utensils and equipment by insects and rodents and by chemicals used to control such vermin. Insecticides and rodenticides, not approved for use in the milk house, shall not be stored in the milk house.
 7. Only insecticides and rodenticides approved for use by the Regulatory Agency and/or registered with EPA are used for insect and rodent control. (Refer to Appendix C. for further information about insect and rodent control.)
 8. Insecticides and rodenticides are used only in accordance with the manufacturer's label directions and are used so as to prevent the contamination of milk, milk containers, utensils and equipment, feed and water.
 9. Covered boxes, bins or separate storage facilities for ground, chopped or concentrated feeds are provided.
 10. Feed may be stored in the milking portion of the barn only in such a manner as will not attract birds, insects or rodents. Open feed dollies or carts may be used for distributing the feed, but not storing feed, in the milking barn. Feed dollies, carts, fully automated feeding systems, or other feed containers may be exempt from the use of covers, provided they do not attract birds, insects, or rodents.

SECTION 9:

Standards For Grade "A" Pasteurized, Ultra-Pasteurized and Aseptically Processed Milk and Milk Products

Milk plants shall comply with all Items of this Section.

A receiving station shall comply with Items 1p to 15p, inclusive, and 17p, 20p and 22p, except that the partitioning requirement of Item 5p shall not apply.

A transfer station shall comply with Items 1p, 4p, 6p, 7p, 8p, 9p, 10p, 11p, 12p, 14p, 15p, 17p, 20p and 22p and as climatic and operating conditions require the applicable provisions of Items 2p and 3p. Provided, that in every case, overhead protection shall be provided.

Facilities for the cleaning and sanitizing of milk tank trucks shall comply with Items 1p, 4p, 6p, 7p, 8p, 9p, 10p, 11p, 12p, 14p, 15p, 20p and 22p and as climatic and operating conditions require, the applicable provisions of Items 2p and 3p. Provided, that in every case, overhead protection shall be provided.

In the case of milk plants, receiving stations and transfer stations, which have HACCP Systems regulated under Appendix K. of this Ordinance, the HACCP System shall address the public health concerns described in this Section in a manner that provides protection equivalent to the requirements in this Section.

Milk plants that have HACCP Systems, which are regulated under the NCIMS HACCP Program, shall comply with all of the requirements of Item 16p. Pasteurization and Aseptic Processing of this Ordinance, and pasteurization shall be managed as a CCP as described in Appendix H. MILK AND MILK PRODUCT CONTINUOUS-FLOW (HTST AND HHST) PASTEURIZATION---CCP MODEL HACCP PLAN SUMMARY; and MILK AND MILK PRODUCT VAT (BATCH) PASTEURIZATION---CCP MODEL HACCP PLAN SUMMARY.

ITEM 1p. FLOORS - CONSTRUCTION

The floors of all rooms in which milk or milk products are handled, processed, packaged, or stored; or in which milk containers, utensils and/or equipment are washed, shall be constructed of concrete or other equally impervious and easily cleanable material; and shall be smooth, properly sloped, provided with trapped drains and kept in good repair. Provided, that cold-storage rooms used for storing milk and milk products need not be provided with floor drains when the floors are sloped to drain to one (1) or more exits. Provided further, that storage rooms for storing dry ingredients, packaged dry ingredients, packaged dry milk or milk products, and/or packaging materials need not be provided with drains and the floors may be constructed of tightly joined wood.

PUBLIC HEALTH REASON

Floors constructed of concrete or other similarly impervious material can be kept clean more easily than floors constructed of wood or other pervious or easily disintegrating material. They will not absorb organic matter and are; therefore, more apt to be kept clean and free of odors. Properly sloped

floors facilitate flushing and help to avoid undesirable conditions. Trapping of drains prevents sewer gas from entering the milk plant.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. The floors of all rooms in which milk or milk products are handled, processed, packaged, or stored; or in which milk containers, utensils, and/or equipment are washed, are constructed of good quality concrete, or equally impervious tile or brick laid closely with impervious joint material, or metal surfacing with impervious joints, or other material which is the equivalent of good quality concrete. The floors of storage rooms for dry ingredients and/or packaging material may be constructed of tightly joined wood.
2. The floor surface is smooth and sloped, so that there are no pools of standing water after flushing, and the joints between the floor and the walls are impervious.
3. The floors are provided with trapped drains. Cold-storage rooms used for storing milk and milk products need not be provided with floor drains when the floors are sloped to drain to one or more exits. Storage rooms for dry ingredients, dry packaged milk or milk products, and/or packaging materials need not be provided with drains.

NOTE: Refer to Item 11p for requirements for floors of drying chambers.

ITEM 2p. WALLS AND CEILINGS - CONSTRUCTION

Walls and ceilings of rooms in which milk or milk products are handled, processed, packaged, or stored; or in which milk containers, utensils and/or equipment are washed, shall have a smooth, washable, light-colored surface and be in good repair.

PUBLIC HEALTH REASON

Properly finished walls and ceilings are more easily kept clean and are; therefore, more apt to be kept clean. A light-colored finish aids in the even distribution of light and the detection of unclean conditions.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Walls and ceilings are finished with smooth, washable, light-colored impervious materials.
2. Walls, partitions, windows and ceilings are kept in good repair.

NOTE: Refer to Item 11p for requirements for walls for drying chambers. Storage rooms used for the storage of packaged dry milk or milk products are exempt from the ceiling requirements of this Item.

ITEM 3p. DOORS AND WINDOWS

Effective means shall be provided to prevent the access of insects and rodents. All openings to the outside shall have solid doors or glazed windows, which shall be closed during dusty weather.

PUBLIC HEALTH REASON

Freedom from insects in the milk plant reduces the likelihood of contamination of the milk or milk product. (Refer to Item 7r-Public Health Reason for information on disease transmission by flies.)

ADMINISTRATIVE PROCEDURES

This item is deemed to be satisfied when:

1. All openings to the outer air are effectively protected by:
 - a. Screening; or
 - b. Effective electric screen panels; or
 - c. Fans or air curtains which provide sufficient air velocity so as to prevent the entrance of insects; or
 - d. Properly constructed flaps where it is impractical to use self-closing doors or air curtains; or
 - e. Any effective combination of a, b, c, or d or by any other method which prevents the entrance of insects.
2. All outer doors are tight and self-closing. Screen doors shall open outward.
3. All outer openings are rodent-proofed to the extent necessary to prevent the entry of rodents.

NOTE: The evidence of insects and/or rodents in the milk plant shall be considered under Item 9p.

ITEM 4p.LIGHTING AND VENTILATION

All rooms in which milk or milk products are handled, processed, packaged, or stored; or in which milk containers, utensils and/or equipment are washed shall be well lighted and well ventilated.

PUBLIC HEALTH REASON

Ample light promotes cleanliness. Proper ventilation reduces odors and prevents condensation upon interior surfaces.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Adequate light sources are provided (natural, artificial or a combination of both) which furnish at least twenty (20) foot-candles (220 lux) of light in all working areas. This shall apply to all

- rooms where milk or milk products are handled, processed, packaged, or stored; or where containers, utensils and/or equipment are washed. Dry storage and cold storage rooms shall be provided with at least five (5) foot-candles (55 lux) of light.
2. Ventilation in all rooms is sufficient to keep them reasonably free of odors and excessive condensation on equipment, walls and ceilings.
 3. Pressurized ventilating systems, if used, have a filtered air intake.
 4. For milk plants that condense and/or dry milk or milk products, ventilating systems in packaging rooms, where used, are separate systems and where possible have the ducts installed in a vertical position.

ITEM 5p. SEPARATE ROOMS

There shall be separate rooms for:

1. The pasteurizing, processing, cooling, reconstitution, condensing, drying and packaging of milk and milk products.
2. Packaging of dry milk or milk products.
3. The cleaning of milk cans and containers, bottles, cases and dry milk or milk product containers.
4. The fabrication of containers and closures for milk and milk products.
5. Cleaning and sanitizing facilities for milk tank trucks in milk plants receiving milk or whey in such tanks.
6. Receiving cans of milk and milk products in milk plants receiving such cans.

Rooms in which milk or milk products are handled, processed, stored, condensed, dried and packaged, or in which containers, utensils and/or equipment are washed or stored, shall not open directly into any stable or any room used for domestic purposes. All rooms shall be of sufficient size for their intended purposes.

Designated areas or rooms shall be provided for the receiving, handling and storage of returned packaged milk and milk products.

PUBLIC HEALTH REASON

If the washing and sanitization of containers are conducted in the same room in which the pasteurizing, processing, cooling, condensing, drying or packaging is done, there is opportunity for the pasteurized product to become contaminated. For this reason, separate rooms are required as indicated. The unloading of cans of raw milk directly into the pasteurizing room is apt to increase the prevalence of insects therein, as well as to render it too public.

ADMINISTRATIVE PROCEDURES⁷

This Item is deemed to be satisfied when:

1. Pasteurizing, processing, reconstitution, cooling, condensing, drying and packaging of milk and milk products are conducted in a single room(s), but not in the same room(s) used for the cleaning of milk cans, portable storage bins, bottles and cases, or the unloading and/or cleaning and sanitizing of milk tank trucks, provided that these rooms may be separated by solid partitioning doors that are kept closed. Provided further, that cooling, plate or tubular, may be done in the room where milk tank trucks are unloaded and/or cleaned and sanitized. Separation/clarification of raw milk may be done in an enclosed room where milk tank trucks are unloaded and/or cleaned and sanitized.

NOTE: Packaging of dry milk or milk products shall be conducted in a separate room.

2. All returned packaged milk and milk products, which have physically left the premises of the processing milk plant, shall be received, handled and stored in separate areas or rooms isolated from the Grade "A" dairy operations. Such separate areas or rooms shall be clearly defined and marked for such use.
3. All bulk milk and milk product storage tanks are vented into a room used for pasteurization, processing, cooling or packaging operations or into a storage tank gallery room. Provided, that vents located elsewhere, which are adequately equipped with air filters so as to preclude the contamination of the milk or milk product shall be considered satisfactory.
4. Facilities for the cleaning and sanitizing of milk tank trucks are properly equipped for manual and/or mechanical operations. When such facilities are not provided on the milk plant premises, these operations shall be performed at a receiving station, transfer station or separate milk tank truck cleaning facility. Items relating to facilities for cleaning and sanitizing milk tank trucks are listed at the beginning of this Section.
5. Rooms in which milk or milk products are handled, processed or stored; or in which milk containers, utensils and/or equipment are washed or stored, do not open directly into any stable or any room used for domestic purposes.
6. All rooms shall be of sufficient size for their intended purposes.

ITEM 6p. TOILET-SEWAGE DISPOSAL FACILITIES

Every milk plant shall be provided with toilet facilities conforming to the regulations of the ... of ...¹ Toilet rooms shall not open directly into any room in which milk and/or milk products are processed. Toilet rooms shall be completely enclosed and shall have tight-fitting, self-closing doors. Dressing rooms, toilet rooms and fixtures shall be kept in a clean condition, in good repair and shall be well ventilated and well lighted. Sewage and other liquid wastes shall be disposed of in a sanitary manner.

PUBLIC HEALTH REASON

Human excreta are potentially dangerous and must be disposed of in a sanitary manner. The organisms causing typhoid fever, para-typhoid fever and dysentery may be present in the body discharges of

active cases or carriers. Sanitary toilet facilities are necessary to protect the milk or milk product, containers, utensils and equipment from fecal contamination, which may be carried by insects, hands or clothing. When the toilet facilities are of a satisfactory type, are kept clean and are in good repair, the opportunities for the spread of contamination by the above means are minimized. The provision of an intervening room or vestibule between the toilet room and any room in which milk or milk products are processed, condensed or dried makes it less likely that contaminated insects will enter these rooms. It will also minimize the spread of odors.

The wastes resulting from the cleaning and rinsing of containers, utensils, equipment and floors, from flush toilets, and from washing facilities, should be properly disposed of so as not to contaminate the milk containers, utensils or equipment, or to create a nuisance or a public health hazard.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. The milk plant is provided with toilet facilities conforming to the regulations of the ... of ...¹
2. Toilet rooms do not open directly into any room in which milk and/or milk products are processed, condensed or dried.
3. Toilet rooms are completely enclosed and have tight-fitting, self-closing doors.
4. Dressing rooms, toilet rooms and fixtures are kept in a clean condition, in good repair and are well ventilated and well lighted.
5. Toilet tissue and easily cleanable covered waste receptacles are provided in toilet rooms.
6. All plumbing is installed to meet the applicable provisions of the State or local plumbing code.
7. Sewage and other liquid wastes are disposed of in a sanitary manner.
8. Non-water-carried sewage disposal facilities are not used.

ITEM 7p.WATER SUPPLY

Water for milk plant purposes shall be from a supply properly located, protected and operated and shall be easily accessible, adequate and of a safe, sanitary quality.

PUBLIC HEALTH REASON

The water supply should be accessible in order to encourage its use in cleaning operations; it should be adequate so that cleaning and rinsing may be thorough; and it should be of a safe, sanitary quality in order to avoid the contamination of containers, utensils and equipment.

ADMINISTRATIVE PROCEDURES⁸

This Item is deemed to be satisfied when:

1. Water for milk plant purposes is from an adequate supply, properly located, protected and operated. It shall be easily accessible and of a safe, sanitary quality.

2. The water supply is approved as safe by the State Water Control Authority and, in the case of individual water systems, complies with the specification outlined in Appendix D. and the Bacteriological Standards outlined in Appendix G.
3. There is no cross-connection between the safe water supply and any unsafe or questionable water supply, or any source of pollution through which the safe water supply might become contaminated. A connection between the water supply piping and a make-up tank, such as for cooling or condensing, unless protected by an air gap or effective backflow preventer, constitutes a violation of this requirement. An approved air gap is defined as the unobstructed vertical distance through the free atmosphere of at least twice the diameter of the largest incoming water supply pipe or faucet to the flood level of the vessel or receptacle. The distance of the air gap is to be measured from the bottom of the potable inlet supply pipe or faucet to the top of the effective overflow, i.e., flood level rim or internal overflow, of the vessel. In no case, may the effective air gap be less than one (1) inch (2.54 cm).
4. Condensing water for milk or milk product evaporators, and water used to produce vacuum and/or to condense vapors in vacuum heat processing equipment, is from a source complying with Item 2 above. Provided, that when approved by the Regulatory Agency, water from sources not complying with Item 2 above, may be used when the evaporator or vacuum heat equipment is constructed and operated to preclude contamination of such equipment, or its contents, by condensing water or by water used to produce vacuum. Means of preventing such contamination are:
 - a. Use of a surface type condenser in which the condensing water is physically separated from the vapors and condensate; or
 - b. Use of reliable safeguards to prevent the overflow of condensing water from the condenser into the evaporator. Such safeguards include a barometric leg extending at least thirty-five (35) feet vertically from the invert of the outgoing condensing water line to the free level at which the leg discharges, or a safety shutoff valve, located on the water feed line to the condenser, automatically actuated by a control which will shut off the in-flowing water when the water level rises above a predetermined point in the condenser. This valve may be actuated by water, air or electricity, and shall be designed so that failure of the primary motivating power will automatically stop the flow of water into the condenser.
5. Condensing water for milk or milk product evaporators, complying with Item 2 above, and water reclaimed from milk or milk products may be reused when all necessary means of protection are afforded and it complies with the procedures outlined in Appendix D., Part V.
6. New individual water supplies and water supply systems, which have been repaired or otherwise become contaminated, are disinfected before being placed in use. (Refer to Appendix D.) The supply shall be made free of the disinfectant by pumping to waste before any sample for bacteriological testing shall be collected.
7. Samples for bacteriological testing of individual water supplies are taken upon the initial approval of the physical structure; each six (6) months thereafter; and when any repair or alteration of the water supply system has been made. Samples shall be taken by the Regulatory Agency and examinations shall be conducted in an official laboratory. To determine if water samples have been taken at the frequency established in this Section, the interval shall include the designated six (6) month period plus the remaining days of the month in which the sample is due.
8. Current records of water test results are retained on file with the Regulatory Agency or as the Regulatory Agency directs.

9. A potable water supply, which meets the criteria of this Section, may be connected to the product feed line of a steam vacuum evaporator, provided that the water supply is protected at the point of connection by an approved backflow prevention device.

ITEM 8p. HAND WASHING FACILITIES

Convenient hand washing facilities shall be provided, including hot and cold and/or warm running water, soap and individual sanitary towels or other approved hand-drying devices. Hand washing facilities shall be kept in a clean condition and in good repair.

PUBLIC HEALTH REASON

Proper use of hand washing facilities is essential to personal cleanliness and reduces the likelihood of contamination of milk and milk products.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Convenient hand washing facilities are provided, including hot and cold and/or warm running water, soap and individual sanitary towels or other approved hand-drying devices.
2. Hand washing facilities are convenient to all toilets and to all rooms in which milk plant operations are conducted.
3. Hand washing facilities are kept in a clean condition and in good repair.
4. Steam-water mixing valves and vats for washing bottles, cans and similar equipment are not used as hand washing facilities.

ITEM 9p. MILK PLANT CLEANLINESS

All rooms in which milk and milk products are handled, processed or stored; or in which containers, utensils and/or equipment are washed or stored, shall be kept clean, neat and free of evidence of insects and rodents. Only equipment directly related to processing operations or the handling of containers, utensils and equipment shall be permitted in the pasteurizing, processing, cooling, condensing, drying, packaging, and bulk milk or milk product storage rooms.

PUBLIC HEALTH REASON

Clean floors, free of litter, clean walls, ceilings and all other areas of the milk plant are conducive to clean milk and milk product handling operations. Cleanliness and freedom from insects and rodents reduces the likelihood of contamination of the milk or milk product. Excess or unused equipment or equipment not directly related to the milk plant operations can be detrimental to the cleanliness of the milk plant.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Only equipment directly related to processing operations or the handling of containers, utensils and equipment is permitted in the pasteurizing, processing, cooling, condensing, drying, packaging, and bulk milk or milk product storage rooms.
2. All piping, floors, walls, ceilings, fans, shelves, tables and the non-product-contact surfaces of other facilities and equipment are clean.
3. No trash, solid waste or waste dry product is stored within the milk plant, except in covered containers. Waste containers at the packaging machine or bottle washer may be uncovered during the operation of such equipment.
4. All rooms in which milk and milk products are handled, processed or stored; or in which containers, utensils, and/or equipment are washed or stored, are kept clean, neat and free of evidence of insects and rodents.
5. Excessive product dust shall be kept under effective control by the use of exhaust and collective systems designed for in-plant dust control. Tailings and materials collected from exhaust collective systems shall not be used for human consumption.

ITEM 10p. SANITARY PIPING

All sanitary piping, fittings and connections which are exposed to milk and milk products or from which liquids may drip, drain or be drawn into milk and milk products shall consist of smooth, impervious, corrosion-resistant, non-toxic, easily cleanable material, which is approved for milk product-contact surfaces. All piping shall be in good repair. Pasteurized milk and milk products shall be conducted from one piece of equipment to another only through sanitary piping.⁹

PUBLIC HEALTH REASON

Milk piping and fittings are sometimes so designed as to be difficult to clean, or they may be constructed of metal, which corrodes easily. In either case, it is unlikely that they will be kept clean. Sanitary milk piping is a term, which applies to properly designed and properly constructed piping. The purpose of the third sentence is to prevent exposure of the pasteurized milk or milk product to contamination.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All sanitary piping, fittings and connections, which are exposed to milk or milk products or from which liquids may drip, drain or be drawn into milk or milk products, consist of smooth, impervious, corrosion-resistant, non-toxic, easily cleanable material.
2. All sanitary piping, connections and fittings consist of:
 - a. Stainless steel of the AISI 300 series; or
 - b. Equally corrosion-resistant metal which is non-toxic and nonabsorbent; or

- c. Heat resistant glass; or
 - d. Plastic, or rubber and rubber-like materials which are relatively inert, resistant to scratching, scoring, decomposition, crazing, chipping and distortion under normal use conditions; are non-toxic, fat resistant, relatively nonabsorbent; which do not impart flavor or odor to the milk or milk product; and which maintain their original properties under repeated use conditions, may be used for gaskets, sealing applications and for short flexible takedown jumpers or connections where flexibility is required for essential or functional reasons.
3. Sanitary piping, fittings and connections are designed to permit easy cleaning; kept in good repair; free of breaks or corrosion; and contain no dead ends of piping in which milk or milk product may collect.
 4. All interior surfaces of demountable piping, including valves, fittings and connections are designed, constructed and installed to permit inspection and drainage.
 5. All mechanically cleaned milk pipelines and return-solution lines are rigid, self-draining and so supported to maintain uniform slope and alignment. Return solution lines shall be constructed of material meeting the specifications of Item 2 above. If gaskets are used, they shall be self-positioning, of material meeting the specifications outlined in Item 2 above and designed, finished and applied to form a smooth, flush interior surface. If gaskets are not used, all fittings shall have self-positioning faces designed to form a smooth, flush interior surface. All interior surfaces of welded joints in pipelines shall be smooth and free from pits, cracks or inclusions.

In the case of welded lines, all welds shall be inspected as they are made and such welds shall be approved by the Regulatory Agency.

Each cleaning circuit shall have access points for inspection in addition to the entrances and exits. These may be valves, removable sections, fittings or other means or combinations that are adequate for the inspection of the interior of the line. These access points shall be located at sufficient intervals to determine the general condition of the interior surfaces of the pipeline.

Detailed plans for welded pipeline systems shall be submitted to the Regulatory Agency for written approval prior to installation. No alteration or addition shall be made to any welded milk pipeline system without prior written approval from the Regulatory Agency.

6. Pasteurized milk and milk products are conducted from one piece of equipment to another only through sanitary milk piping.
7. For milk plants that dry milk or milk products, because of the high pressure required to obtain proper dispersal of the product in the drying chamber, the pipeline between the high pressure pump and the dryer nozzle may be connected with pressure-tight threaded fittings, or may be welded.

ITEM 11p. CONSTRUCTION AND REPAIR OF CONTAINERS AND EQUIPMENT

All multi-use containers and equipment that milk and milk products come into contact with shall be of smooth, impervious, corrosion-resistant, non-toxic material; shall be constructed for ease of cleaning; and shall be kept in good repair. All single-service containers, closures, gaskets and other articles that milk and milk products come into contact with shall be non-toxic and shall have been manufactured,

packaged, transported and handled in a sanitary manner. Articles intended for single-service use shall not be reused.

PUBLIC HEALTH REASON

When equipment is not constructed and located so that it can be cleaned easily, and is not kept in good repair, it is unlikely that it will be properly cleaned.

Single-service articles, which have not been manufactured and handled in a sanitary manner, may contaminate the milk or milk product.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All multi-use containers and equipment that milk and milk products come into contact with are of smooth, impervious, corrosion-resistant and non-toxic material.
2. All milk and milk product-contact surfaces of multi-use containers and equipment consist of:
 - a. Stainless steel of the AISI 300 series; or
 - b. Equally corrosion-resistant metal which is non-toxic and nonabsorbent; or
 - c. Heat resistant glass; or
 - d. Plastic or rubber and rubber-like materials which are relatively inert, resistant to scratching, scoring, decomposition, crazing, chipping and distortion under normal use conditions; which are non-toxic, fat resistant, relatively nonabsorbent and do not impart flavor or odor to the milk or milk product; and which maintain their original properties under repeated use conditions.
3. All joints in containers, utensils and equipment are flush and finished as smooth as adjoining surfaces, or if the surface is vitreous, it must be continuous. Tile floors are not acceptable in dryers. Joints on equipment coming in contact with dry milk or milk products only or used for hot air piping may be sealed by other acceptable means. Where a rotating shaft is inserted through a surface with which milk or milk products come into contact, the joint between the moving and stationary surfaces shall be close-fitting. Grease and oil from gears, bearings, and cables shall be kept out of the milk and milk products. Where a thermometer or temperature-sensing element is inserted through a surface, with which milk or milk products come into contact, a pressure-tight seal shall be provided ahead of all threads and crevices.
4. All openings in covers of tanks, vats, separators, etc. are protected by raised edges, or otherwise, to prevent the entrance of surface drainage. Condensation-diverting aprons shall be provided as close to the tank or vat as possible on all pipes, thermometers, or temperature sensing elements and other equipment extending into a tank, bowl, vat or similar equipment, unless a watertight joint is provided.
5. All surfaces with which milk or milk products come into contact, except pneumatic ducts and cyclonic or air separator collectors, are easily accessible or demountable for manual cleaning or are designed for mechanical cleaning. Provided, that flexible plastic or rubber tanker loading and unloading hoses with screw-type hose clamps shall be considered in compliance, if an appropriate screwdriver or tool is readily available for disassembly. All product-contact surfaces shall be readily accessible for inspection and shall be self-draining.

6. There are no threads used in contact with milk or milk products except where needed for functional and safety reasons, such as in clarifiers, pumps and separators. Such threads shall be of a sanitary type, except those used on high-pressure lines between the high pressure pump and the dryer nozzle.
7. All multi-use containers and other equipment have rounded corners; are in good repair; and free from breaks, crevices and corrosion. Milk cans shall have umbrella-type covers.
8. Strainers, if used, are of perforated metal design and so constructed as to utilize single-service strainer media. Multiple-use, woven material shall not be used for straining milk. Provided, that when required for functional reasons inherent to the production of certain milk products, such as buttermilk, whey, dry whey, and dry milk products, woven material may be used where it is impractical to use perforated metal. However, woven material parts shall be mechanically cleaned by such methods that thoroughly clean the woven material and do not contaminate the product.
9. Sifters for dry milk products are so constructed as to utilize single-service or multi-service use strainer media conforming with:
 - a. Plastic materials listed in 2.d. above; or
 - b. Woven stainless steel wire conforming to 2.a. above; or
 - c. Cotton, linen, silk, or synthetic fibers which are non-toxic, relatively insoluble, easily cleanable and do not impart a flavor to the product.

Tailings shall be continuously discharged from sifters through dust-tight connections to an enclosed container and shall not be used for human consumption.

10. All single-service containers, closures, gaskets and other articles that milk or milk products come in contact with are non-toxic.
11. The manufacture, packing, transportation and handling of single-service containers, closures, caps, gaskets and similar articles comply with the requirements of Appendix J. Standards for the Fabrication of Single-Service Containers and Closures for Milk and Milk Products. Provided, that all paper, plastics, foil, adhesives, and other components of containers used in the packaging of milk or milk products that have been condensed and/or dried shall be free from deleterious substances and comply with the requirements of the FFD&C Act.

Inspections and tests shall be made by the Regulatory Agency or any Agency authorized by them.

NOTE: 3-A Sanitary Standards for dairy equipment are promulgated jointly by the Sanitary Standards Subcommittee of the Dairy Industry Committee, the Committee on Sanitary Procedure of the International Association for Food Protection and the Milk Safety Branch, Center for Food Safety and Applied Nutrition, Food and Drug Administration, Public Health Service, Department of Health and Human Services. Equipment manufactured in conformity with 3-A Sanitary Standards complies with the sanitary design and construction standards of this Ordinance.

ITEM 12p. CLEANING AND SANITIZING OF CONTAINERS AND EQUIPMENT

The product-contact surfaces of all multi-use containers, utensils and equipment used in the transportation, processing, condensing, drying, packaging, handling, and storage of milk or milk

products shall be effectively cleaned and shall be sanitized before each use. Provided, that cloth-collector systems used on dryers shall be cleaned and sanitized or purged at intervals and by methods recommended by the manufacturer and approved by the Regulatory Agency. Provided further, that piping, equipment and containers used to process, conduct or package aseptically processed milk and milk products, beyond the final heat treatment process, shall be sterilized before any aseptically processed milk or milk product is packaged and shall be re-sterilized whenever any nonsterile product has contaminated it.

PUBLIC HEALTH REASON

Milk and milk products cannot be kept clean and safe, if permitted to come into contact with containers, utensils and equipment that have not been properly cleaned and sanitized.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All multi-use containers and utensils are thoroughly cleaned after each use and all equipment is thoroughly cleaned at least once each day used, unless the Regulatory Agency has reviewed and accepted information, in consultation with FDA, supporting the cleaning of multi-use containers and utensils at frequencies extending beyond one (1) day or seventy-two (72) hours in the case of storage tanks, or 44 hours in the case of evaporators, which are continuously operated. Supporting information shall be submitted to and approved by the Regulatory Agency prior to initiating the qualification period if required. Finished product produced during an extended run must meet all applicable requirements of Section 7 of this Ordinance. Any significant equipment or processing changes shall be communicated to the Regulatory Agency.

The supporting information may include but is not limited to:

- a. Statement of proposal, including desired cleaning frequency.
- b. Product and equipment description.
- c. Intended use and consumers.
- d. Distribution and storage temperatures of product.
- e. Diagram of process of interest.
- f. Process parameters, including temperature and times.
- g. Hazard evaluation and safety assessment.
- h. Review of equipment for sanitary design.
- i. When indicated by a hazard evaluation and safety assessment, a plan for initial qualification shall be developed to address identified critical process parameters.

Otherwise, storage tanks shall be cleaned when emptied and shall be emptied at least every seventy-two (72) hours. Records must be available to verify that milk storage in these tanks does not exceed seventy-two (72) hours. These records shall be available for at least the previous three (3) months or from the time of the last regulatory inspection, whichever is longer. In the case of pasteurized storage tanks, which are mechanically cleaned at intervals of less than seventy-two (72) hours, the mechanical cleaning records required under Item 2.b. of

this Section shall be considered adequate. Storage tanks, which are used to store raw milk or milk products or heat-treated milk products longer than twenty-four (24) hours and silo tanks used for the storage of raw milk or milk products or heat-treated milk products shall be equipped with a seven (7) day temperature recording device complying with the specifications of Appendix H. Otherwise provided, evaporators shall be cleaned at the end of a continuous operation, not to exceed forty-four (44) hours, and records must be available to verify that the operation time does not exceed forty-four (44) hours.

Drying equipment, cloth-collector systems, packaging equipment and multi-use dry milk products and dry whey storage containers are cleaned at intervals and by methods recommended by the manufacturer and approved by the Regulatory Agency. Such methods may include cleaning without water by use of vacuum cleaners, brushes, or scrapers. After cleaning, such equipment is sanitized by a method approved by the Regulatory Agency. Cloth collector systems and all dry product-contact surfaces downstream from the dryer shall be sanitized or purged at intervals and by methods recommended by the manufacturer and approved by the Regulatory Agency. Storage bins used to transport dry milk or milk products shall be dry cleaned after each usage and washed and sanitized at regular intervals.

NOTE: Appendix F. contains additional information on dry cleaning of drying equipment, packaging equipment, and dry milk product and dry whey storage containers.

All milk tank trucks that transport Grade "A" milk and milk products, shall be washed and sanitized at a permitted milk plant, receiving station, transfer station, or milk tank truck cleaning facility. Whenever a milk tank truck has been cleaned and sanitized, as required by the Regulatory Agency, it shall bear a tag or a record shall be made showing the date, time, place and signature or initials of the employee or contract operator doing the work, unless the milk tank truck delivers to only one receiving facility where responsibility for cleaning and sanitizing can be definitely established without tagging. The tag shall be removed at the location where the milk tank truck is next washed and sanitized and kept on file for fifteen (15) days as directed by the Regulatory Agency.

2. Pipelines and/or equipment designed for mechanical cleaning meet the following requirements:
 - a. An effective cleaning and sanitizing regimen for each separate cleaning circuit shall be followed.
 - b. A temperature recording device, complying with the specifications in Appendix H., or a recording device which provides sufficient information to adequately evaluate the cleaning and sanitizing regimen and which is approved by the Regulatory Agency, shall be installed in the return solution line or other appropriate area to record the temperature and time which the line or equipment is exposed to cleaning and sanitizing solutions. For purposes of this Section, recording devices which produce records not meeting the specifications of Appendix H. may be acceptable if:
 1. (1) The device provides a continuous record of the monitoring of the cleaning cycle time and temperature, cleaning solution velocity or cleaning pump operation and the presence or strength of cleaning chemicals for each cleaning cycle.
 2. (2) The record shows a typical pattern of each circuit cleaned, so that changes in the cleaning regimen may be readily detected.
 3. (3) Electronic storage of required cleaning records, with or without hard copy printouts, may be acceptable, provided, the electronically generated records are

readily available. Electronic records must meet the criteria of this Section and those provisions of Appendix H., which are determined to be applicable by the Regulatory Agency and FDA. Except that, electronic storage of required cleaning records, with or without hard copy, shall be acceptable, provided the computer and computer generated records are readily available and meet the criteria of this Section and the 21 CFR Part 11.

- c. Cleaning charts and electronically stored records required by this Section shall be identified, dated and retained for three (3) months or until the next regulatory inspection, whichever is longer.
 - d. During each official inspection, the Regulatory Agency shall examine charts and records to verify the cleaning regimens.
3. Milk plants in which containers are washed manually are equipped with a two (2)-compartment wash-and-rinse vat for this purpose. Such milk plants shall also provide a steam cabinet or individual steam-jet plate with hood for sanitizing of cleaned containers, or if sanitizing is done with chemicals, a third treatment vat.
 4. In milk plants utilizing automatic bottle washers, such washers must provide for bactericidal treatment by means of steam, hot water or chemical treatment. In soaker-type bottle washers, in which bactericidal treatment depends upon the causticity of the washing solution, the caustic strength for a given soaking time and temperature shall be as specified in the following table, which lists the combinations of causticity, time and temperature, of equal bactericidal value, for the soaker tank of soaker-type bottle washers:

Table 2. Combinations of Causticity, Time and Temperature, of Equal Bactericidal Value, for the Soaker Tank of Soaker-Type Bottle Washers (Based on NSDA Specifications for beverage bottles)							
Time in Minutes	Temperature, Degrees C (F)						
	77 (170)	71 (160)	66 (150)	60 (140)	54 (130)	49 (120)	43 (110)
	Concentration of NaOH (percent)						
3 min.	0.57	0.86	1.28	1.91	2.86	4.27	6.39
5 min.	0.43	0.64	0.96	1.43	2.16	3.22	4.80
7 min.	0.36	0.53	0.80	1.19	1.78	2.66	3.98

NOTE: The National Soft Drink Association (NSDA), Washington, D.C. 20036 alkali test, the NSDA caustic test, or other suitable test may be used to determine the strength of the soaker solution. The caustic strength shall be tested monthly by the Regulatory Agency.

5. When caustic is so used, subsequent final rinsing of the bottles shall be with water, which has been treated with heat or chemicals to assure freedom from viable pathogenic or otherwise harmful organisms, to prevent recontamination of the treated bottle during the rinsing operation.
6. All multi-use containers, utensils and equipment are sanitized before use, employing one or a combination of the methods prescribed under Item 11r. Additionally, for milk plants that

condense or dry milk or milk products the following methods are acceptable, or any other method, which has been demonstrated to be equally efficient:

- a. Exposure to an enclosed jet of steam for not less than 1 minute.
- b. Exposure to hot air at a temperature of at least 83°C (180°F) for at least twenty (20) minutes as measured by an acceptable indicating thermometer located in the coldest zone.

Assembled equipment must be sanitized prior to each day's run, unless FDA and the Regulatory Agency have reviewed and accepted information supporting the sanitizing of multi-use containers, utensils and equipment at frequencies extending beyond one (1) day. Tests to determine the efficiency of sanitization should be made by the Regulatory Agency at intervals sufficient to satisfy the Regulatory Agency that the sanitization process is effective. Provided, that all piping, equipment and containers used to conduct, process or package aseptically processed milk and milk products, beyond the final heat treatment process, shall be sterilized by heat, chemical sterilant(s) or other appropriate treatment before use and resterilized whenever it has been contaminated by nonsterile product.

For milk plants that dry milk or milk products, higher temperatures and longer periods may be necessary for the sanitization of high-pressure lines. It has been demonstrated that alkaline cleaners at 72°C (160°F) for thirty (30) minutes, followed by an acid cleaner for thirty (30) minutes at the same temperature, produce satisfactory results. Studies have indicated that effective sanitization of the dryer may be accomplished by the following procedure:

- c. Operate the spray nozzles with water at a temperature and rates at least as high as those employed during the drying operation.
- d. Adjust airflow to give at least 0.5 inch (water) pressure in the drying chamber.
- e. Continue the operation for twenty (20) minutes while a temperature of not less than 85°C (185°F) is being registered at the discharge from the dryer.

Portions of the drying system not reached by this treatment or dryers in which this procedure is not practical shall be treated by one of the methods prescribed above, or by other methods of demonstrated effectiveness.

7.

- a. The residual bacteria count of multi-use containers and closures shall be conducted as outlined in Appendix J. The residual bacteria count of multi-use containers, used for packaging pasteurized milk and milk products, shall not exceed one (1) colony per milliliter (1/mL) of capacity, when the rinse test is used, or fifty (50) colonies per fifty (50) square centimeters (one (1) colony per square centimeter) of product-contact surface, when the swab test is used, in three (3) out of four (4) samples taken at random on a given day. Coliform organisms shall be undetectable in all multi-use containers.
- b. The residual bacteria count of single-service containers and closures, used for packaging pasteurized milk and milk products, shall not exceed fifty (50) colonies per container, or in the case of dry product packaging, shall not exceed one (1) colony per milliliter (1/mL) of capacity when the rinse test is used, except that in containers less than 100 mL the count shall not exceed ten (10) colonies or fifty (50) colonies per eight (8) square inches (one (1) colony per square centimeter) of product-contact surface, when the swab test is used, in three (3) out of four (4) samples taken at random on a given day. Coliform organisms shall be undetectable in all single-service containers.

- c. When single-service containers or closures are fabricated in another plant that conforms to the Standards of Appendix J. and the Regulatory Agency has information that they do comply, the Regulatory Agency may accept the containers as being in conformance without additional testing. If there is reason to believe that containers do not conform to the bacteriological standards, additional testing may be required. If containers are fabricated in the milk plant, the Regulatory Agency shall collect, during any consecutive six (6) months, at least four (4) sample sets of containers, as defined in Appendix J., from each manufacturing line, as defined in Appendix J., in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days, and analyze the sample sets at an Official, Commercial or Industry Laboratory, approved by the State Milk Laboratory Certifying Agency specifically for the examinations required under Appendix J.
7. Milk plants that utilize multi-use plastic containers, for pasteurized milk and milk products, shall comply with the following criteria:
 - a. All containers shall be identified as to plant of manufacture, date of manufacture and type and class of plastic material used. This information may be by code. Provided, that the code is revealed to the Regulatory Agency.
 - b. A device shall be installed in the filling line capable of detecting, in each container before it is filled, volatile organic contaminants in amounts that are of public health significance. Such device must be constructed so that it may be sealed by the Regulatory Agency to prevent the changing of its sensitivity functioning level. Models using an air injection system and with a testing device built into the detection equipment do not have to be sealed. To assure proper functioning of the system the operator needs to be able to adjust the sensitivity. However, those models utilizing an external testing device must be sealed. Any container detected by the device, as being unsatisfactory must be automatically made unusable to prevent refilling. In addition, the device must be interconnected so that the system will not operate unless the detecting device is in proper operating condition. Provided, that any other system so designed and operated that will provide equal assurance of freedom from contamination and recognized by FDA to be equally efficient may be accepted by the Regulatory Agency.

When other systems are used in place of a device for the detection of volatile organic contaminants, the following criteria has been developed to determine what constitutes equal assurance:

1. (1) A soaker-type washer shall be used for cleaning and sanitizing the containers and shall conform with the following criteria:
 1. i) If caustic is used, the caustic strength for a given washing time and temperature shall be as specified in Table 2 of this Item; or
 2. ii) If a cleaning compound, other than caustic is used, the compound shall be a mild or moderately alkaline, granular composition formulated from a blend of sodium phosphate and anionic synthetic detergents and conform to the following:
 1. A) The used solution shall have at least a three percent (3%) concentration with a pH of at least 11.9 and an alkalinity expressed as sodium oxide of at least 2.5 percent;

2. B) There shall be at least a two (2) minute soak time in the soaker tank;
 3. C) The temperature of the soaker tank shall be at least 69°C (155°F); and
 4. D) The final rinse subsequent to the soaking tank shall be with a sanitizing solution.
3. iii) The soaker-type washer system shall be so designed and operated that unless the time, temperature and concentration, as specified for the soaker solutions, are met, the containers cannot be discharged from the washer. The mechanism for control of the time, temperature and concentration of the use solution shall be sealed.
2. (2) A thorough inspection procedure shall be in effect to remove any containers, which show stress cracks, splitting, pitting, discoloration, or cloudiness, as well as any unremoved soil. This must be carried out with adequate light and be much more thorough than the customary cursory inspection given to glass bottles.
- c. A standard must be available for use by the Regulatory Agency for testing the proper sensitivity functioning levels of the detection device.
 - d. The containers shall comply with the applicable construction requirements of Item 11p of this Ordinance. The closure for the container shall be single-service. Screw-type closures shall not be used.
 - e. The container shall not impart, into the product, pesticide residual levels or other chemical contaminants in excess of those considered acceptable under the FFD&CA and regulations issued there under.
 - f. The phrase "Use only for food" shall appear on all containers.

ITEM 13p. STORAGE OF CLEANED CONTAINERS AND EQUIPMENT

After cleaning, all multi-use milk or milk product containers, utensils and equipment shall be transported and stored to assure complete drainage and shall be protected from contamination before use.

PUBLIC HEALTH REASON

If containers and equipment are not protected from contamination, the value of sanitization may be partly or entirely nullified.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

All multi-use containers, utensils and equipment, after cleaning, are transported and/or stored on racks made of impervious food grade materials, or in clean cases elevated above the floor. Containers shall be stored inverted, if practicable, on racks or in cases constructed of relatively nonabsorbent,

impervious, food-grade, corrosion-resistant, non-toxic materials, or otherwise protected from contamination.

ITEM 14p. STORAGE OF SINGLE-SERVICE CONTAINERS, UTENSILS AND MATERIALS

Single-service caps, cap stock, parchment paper, containers, gaskets, liners, bags and other single-service articles for use in contact with milk and milk products shall be purchased and stored in sanitary tubes, wrappings or cartons; shall be kept therein in a clean, dry place until used; and shall be handled in a sanitary manner.

PUBLIC HEALTH REASON

Soiled or contaminated caps, parchment paper, gaskets and single-service containers nullify the benefits of the safeguards prescribed throughout this Ordinance. Packing the caps in tubes, which remain unbroken until they are placed in the bottling machine, is the best method of assuring cap cleanliness.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Single-service caps, cap stock, parchment paper, containers, gaskets, liners, bags and other single-service articles for use in contact with milk and milk products are purchased and stored in sanitary tubes, wrappings or cartons; are kept in a clean, dry place until used; and are handled in a sanitary manner.
2. Paperboard shipping containers used to enclose plastic bags or unfilled containers are used only once, unless other methods are employed to protect the containers from contamination.
3. Tubes or cartons are not refilled with spilled caps, gaskets or parchment papers.
4. Cartons or boxes from which contents have been partially removed are kept closed.
5. Suitable cabinets are provided for storage of tubes after removal from the large outer box, and for storage of opened cartons, unless other satisfactory means are employed to protect the caps, closures or containers.

ITEM 15p. PROTECTION FROM CONTAMINATION

Milk plant operations, equipment and facilities shall be located and conducted to prevent any contamination of milk or milk products, ingredients, containers, utensils and equipment. All milk or milk products or ingredients that have been spilled, overflowed or leaked shall be discarded. The processing or handling of products other than Grade "A" milk or milk products in the milk plant shall be performed to preclude the contamination of such Grade "A" milk and milk products. The storage, handling and use of poisonous or toxic materials shall be performed to preclude the contamination of milk and milk products, or ingredients of such milk and milk products, or the product-contact surfaces of all containers, utensils and equipment.

PUBLIC HEALTH REASON

Because of the nature of milk and milk products and their susceptibility to contamination by bacteria, chemicals and other adulterants, every effort should be made to provide adequate protection for the milk and milk products at all times. Misuse of pesticides and other harmful chemicals can provide opportunities for contamination of the milk and milk product or equipment with which the milk or milk product comes in contact.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

15p. (A)

1. Equipment and operations are so located within the milk plant as to prevent overcrowding and contamination of cleaned and sanitized containers, utensils and equipment by splash, condensation or manual contact.
2. Packaged milk and milk products, which have physically left the premises or the processing milk plant are not re-pasteurized for Grade "A" use. The Regulatory Agency may, on a specific individual request, authorize reprocessing of packaged milk and milk products, provided all other aspects of this Item, including proper storage temperature and container integrity are complied with. Provided, that the re-pasteurization of milk and milk products shipped in milk tank trucks, which have been pasteurized at another Grade "A" milk plant and have been handled in a sanitary manner and maintained at 7°C (45°F) or less is permitted. Equipment, designated areas or rooms utilized for handling, processing and storage of returned packaged milk or milk products are maintained, operated, cleaned and sanitized so as to preclude the contamination of Grade "A" products and equipment and the Grade "A" operations.
3. All product-contact surfaces of containers, utensils and equipment are covered or otherwise protected to prevent the access of insects, dust, condensation and other contamination. All openings, including valves and piping attached to milk and milk product storage tanks and milk tank trucks, pumps, vats, etc., shall be capped or otherwise properly protected. While unloading at a milk plant, receiving station or transfer station, one of the following conditions shall be met:
 - a. If the area is completely enclosed, walls and ceiling, with doors closed during the unloading process and the dust-cover or dome and the manhole cover is opened slightly and held in this position by the metal clamps used to close the cover, then a filter is not required. However, if the dust cover and/or manhole cover(s) are opened in excess of that provided by the metal clamps or the covers have been removed, then a suitable filter is required for the manhole.
 - b. If the area is not completely enclosed or doors of the unloading area are open during unloading, a suitable filter is required for the manhole or air inlet vent and suitable protection must be provided over the filter material either by design of the filter holding apparatus or a roof or ceiling over the area. When weather and environmental conditions permit, manhole openings and covers of milk tank trucks may be opened outdoors for the short period of time necessary for the collection of samples for animal drug residue screening. Direct connections from milk tank truck to milk tank truck must be made from valve-to-valve or through the manhole lid. Provided, that all connections are made ferrule-to-ferrule and adequate protection is provided for the air vent.

Receiving and dump vats shall be completely covered, except during washing and sanitizing, and when milk is being dumped. Where strainers are used, the cover for the vat opening shall be designed to cover the opening with the strainer in place.

4. Ingredients added to milk and milk products are handled in such a manner as to avoid contamination.
5. Whenever air under pressure is used for the agitation or movement of milk or milk products, or is directed at a milk or milk product-contact surface, it is free of oil, dust, rust, excessive moisture, extraneous materials and odor, and shall otherwise comply with the applicable standards of Appendix H. Air intakes for drying equipment shall be located so as to minimize the amount of atmospheric contamination and shall be equipped with suitable single-service filters, multi-use filters, or continuous air filter systems. (Refer to Appendix H.) The use of steam containing toxic substances is expressly prohibited. Whenever steam is used in contact with milk or milk products it shall be of culinary quality and shall comply with the applicable standards of Appendix H.
6. Air exhausts from dryer systems are covered when dryers are not in operation.
7. Standardization of Grade "A" milk and milk products with other than Grade "A" milk and milk products is prohibited. This Ordinance permits standardization as a process of adjusting the milk fat of milk in a milk plant by the addition or removal of cream or non-fat (skim) milk.
8. All multi-use cases used to encase packaged milk and milk product containers are cleaned prior to their use.
9. All ingredients and non-product-contact materials used in the preparation or packaging of milk and milk products are stored in a clean place and are so handled as to prevent their contamination.
10. Pasteurized milk and milk products are not strained or filtered, except through a perforated metal strainer.
11. Only those poisonous or toxic materials, including but not limited to insecticide, rodenticides, detergents, sanitizers, caustics, acids, related cleaning compounds and medicinal agents necessary for the maintenance of the milk plant are present in the milk plant.
12. Those poisonous or toxic materials that are necessary are not stored in any room where milk or milk products are received, processed, pasteurized, condensed, dried or stored; or where containers, utensils or equipment are washed; or where single-service containers, closures, bags, or caps are stored.
13. Those poisonous or toxic materials that are necessary are stored in a separate area of the milk plant in prominently and distinctly labeled containers. Provided that, this does not preclude the convenient availability of detergents or sanitizers to areas where containers, utensils and equipment are washed and sanitized.
14. Only insecticides and rodenticides approved by the Regulatory Agency and/or registered with the EPA shall be used for insect and rodent control. Such insecticides and rodenticides shall be used only in accordance with the manufacturer's label directions and shall be prevented from contaminating milk and milk products, containers, utensils and equipment.
15. In the case of separating non-Grade "A" and Grade "A" milk or milk products, a water rinse after processing non-Grade "A" and prior to Grade "A" is adequate separation, provided both are processed as Grade "A", and raw and pasteurized milk or milk products are kept physically separated.

16. Grade "A" raw milk or milk products and non-Grade "A" raw products, dairy or non-dairy, shall be separated by one (1) valve.
17. Grade "A" pasteurized milk or milk products and non-Grade "A" pasteurized products, dairy or non-dairy, shall be separated by one (1) valve.
18. Provided, that during the actual flushing of raw milk or milk product lines and vessels with water, there shall be a sufficient separation between water piping and unpasteurized milk or milk products, or lines used to conduct unpasteurized milk or milk products, to prevent the accidental addition of water.
19. When two (2) grades of milk or milk products are received in the same milk plant in dual receiving equipment, a swing type dump grill is not permitted. When two (2) grades of milk or milk products are received in the milk plant by milk tank trucks, separate receiving equipment and unloading pumps shall be provided.

15p.(B)

1. During processing, pipelines and equipment used to contain or conduct milk and milk products shall be effectively separated from tanks or circuits containing cleaning and/or sanitizing solutions. This can be accomplished by:
 - a. Physically disconnecting all connection points between tanks or circuits containing cleaning and/or sanitizing solutions from pipelines and equipment used to contain or conduct milk or milk products; or
 - b. Separation of all connection points between such circuits by at least two (2) automatically controlled valves with a drainable opening to the atmosphere between the valves; or by a single-bodied double seat valve, with a drainable opening to the atmosphere between the seats, if:
 1. (1) The opening to the atmosphere (vent) is equal to the largest pipeline feeding the valve(s).
 2. (2) Both valves, and valve seats in the case of single-bodied double seat valves, are position detectable and capable of providing an electronic signal when not properly seated in the blocked position.
 3. (3) These valves, or valve seats in the case of single-bodied double seat valves, are part of an automatic fail-safe system that will prevent contamination of product with cleaning or sanitizing solutions. Automatic fail-safe systems will be unique to each particular installation but are normally based on the premise that both blocking valve seats are properly seated in the blocked position before the mechanical cleaning system can be activated for the cleaning circuit containing this valve arrangement.
 4. (4) The system does not have any manual overrides.
 5. (5) Controls for the fail-safe system are secured as directed by the Regulatory Agency in order to prevent unauthorized changes.
 6. (6) The vent is not cleaned until milk and milk products have been removed or isolated.
 7. (7) Variations from the above specifications may be individually evaluated and found to also be acceptable if the level of protection is not compromised.

For Example: In low pressure, gravity drain applications where the product line is the same size or larger than the cleaning or sanitizing solution line, the vent may be the size of the solution line and the valves or valve seats need not be position detectable. If a common drain line is used to connect vent lines from more than one (1) block-and-bleed vent, such as in the case of drain lines from a series of cheese vats with a common drain for the block-and-bleed vent lines, the cross sectional area of the common drain line must be at least equal to the total cross sectional area of the lines connected to the header. Or, a common drain line of the same size as the vent may be used, if provisions are included in a fail-safe control system to sequence the use and cleaning of the vats to assure that no more than one (1) vat attached to that drain can be washed at the same time. All other criteria still apply. In order to accept this variation, the valve(s) must fail to the blocked position upon loss of air or power, and there must be no pumps capable of pushing milk or milk product, cleaning solutions, or sanitizing solutions into this valve arrangement.

- c. In the case of aseptically processed and higher-heat-shorter-time (HHST) pasteurized milk and milk products that are processed and the equipment cleaned and/or chemically sanitized above the atmospheric boiling point of the milk or milk product or cleaning and/or sanitizing solutions, the required separation between pipe lines and equipment, used to contain or conduct milk and milk products, and tanks or circuits containing cleaning and/or chemical sanitizing solutions, may be accomplished using an alarmed steam block(s), located between the milk and milk product and cleaning and/or chemical sanitizing solutions if:
 1. (1) The steam block is equipped with a visible steam trace that exits at the bottom of the steam block;
 2. (2) The steam trace is equipped with a temperature sensor that is capable of differentiating between those temperatures that indicate steam exiting the steam trace has not been exposed to liquid in the steam block and temperatures that will occur when liquid is present in the steam block;
 3. (3) This steam trace shall be physically isolated from other steam lines or traces such that the temperature sensor measures the steam temperature only from that single trace;
 4. (4) The temperature sensor is integrated with automatic controls, such that when there is milk or milk products on one (1) side of the steam block and cleaning and/or chemical sanitizing solutions on the other side of the steam block, and the temperature sensor in the steam trace detects a temperature that indicates that liquid, rather than steam, is present in the steam trace, the cleaning pump will be de-energized, and when needed to prevent solution pressure on the steam block, the cleaning and/or chemical sanitizing solution are automatically drained away from the steam block. Except that:
 1. i) In systems where the cleaning and/or sanitizing solution is circulated by the timing pump, that pump may continue to operate during an alarmed condition, provided a legal flow-diversion device (FDD) is used to divert the cleaning and/or chemical sanitizing solution flow away from the steam block.
 2. ii) In aseptic processing systems that are not equipped with a legal FDD and where the cleaning and/or sanitizing solution is circulated by the

timing pump of the aseptic processing system, that pump may continue to operate during an alarmed condition, provided there are at least two (2) instrumented steam blocks between the milk and milk product and the cleaning and/or chemical sanitizing solutions and at least one (1) of the blocks remains uncompromised.

5. (5) During times when a steam block(s) is used as described in this Section to provide separation between pipe lines and equipment, used to contain or conduct milk and milk products, and tanks or circuits containing cleaning and/or chemical sanitizing solutions, there shall be no time delays or other means that delay an immediate automatic response to liquid exiting the steam trace; and
6. (6) Although the automatic control system is not required to comply with Appendix H. V., Criteria for the Evaluation of Computerized Systems for Grade "A" Public Health Controls, there shall be means provided to test and verify the accuracy of the sensor and the operation of the control system.

In order to facilitate testing, the temperature set point that will activate the automatic controls, described in this Section, will be identified for each steam block used for this purpose. Means shall be provided to verify that lowering the temperature below this set point will activate the control system when a steam block(s) is used, as described in this Section, to provide separation between pipe lines and equipment, used to contain or conduct milk and milk products, and tanks or circuits containing cleaning and/or chemical sanitizing solutions.

2. NOTE: The valve arrangement(s) described in this Section shall not be used to separate raw products, dairy, non-dairy or water, from pasteurized milk or milk products. Provided that, nothing in this Section shall be construed as barring any other means to separate milk and milk product from cleaning/sanitizing solution in HHST and Aseptic Processing Systems, which have been recognized by FDA and in the case of aseptic processing equipment, by the Processing Authority, to be equally effective and which are approved by the Regulatory Agency.
3. Except as permitted in Item 16p, there shall be no physical connection between unpasteurized products, dairy, non-dairy, or water, and pasteurized milk or milk products. Pasteurized non-dairy products or water not completely separated from pasteurized milk and milk products, shall be pasteurized at times and temperatures which meet at least the minimum times and temperatures provided for in Definition EE or in the case of water have undergone an equivalent process found acceptable by FDA and the Regulatory Agency or has undergone a hazard evaluation and safety assessment of the specific water supply and application involved and has been treated, as necessary, following a protocol acceptable to the Regulatory Agency, in consultation with FDA, to ensure the water will not compromise the safety of the milk or milk product.

This Section does not require separate raw and pasteurized mechanical cleaning systems.

4. Pasteurized re-circulation lines, divert lines, and leak-detect lines connecting to the constant-level tank shall be designed so that there is an air gap between the termination of these pipelines and the raw milk or milk product overflow level. This air gap must be equivalent to at least two (2) times the diameter of the largest of these pipelines. For purposes of this Section, an overflow is defined as the flood rim of the constant-level tank or any unrestricted opening below the flood rim of the constant-level tank which is large enough that it is at least equivalent to two (2) times the diameter of the largest of these pipelines.

5. All milk and milk products that have overflowed, leaked, been spilled or improperly handled are discarded. Milk and milk products drained from processing equipment at the end of a run, collected from a defoamer system, and milk or milk product solids rinsed from equipment, containers or pipelines shall be repasteurized only if such milk or milk products are handled in a sanitary manner and maintained at 7°C (45°F) or less. When the handling and/or cooling of such milk and milk products are not in compliance with this requirement, they shall be discarded. Milk and milk products from damaged, punctured or otherwise contaminated containers or product from out-of-code containers shall not be repasteurized for Grade "A" use.
6. Means are provided to prevent contamination of milk and milk products, containers, utensils and equipment by drippings, spillage and splash from overhead piping, platforms or mezzanines.
7. The processing of foods and/or drinks other than Grade "A" milk and milk products are performed to preclude the contamination of such milk and milk products.
8. No product is handled in the milk plant that may create a public health hazard. Permission to handle products other than those defined in Section 1 or to conduct operations in equipment or rooms, other than those for which they are designated, should be provisional and subject to revocation if found objectionable.
9. In no case shall pasteurized milk or milk products, be standardized with unpasteurized milk or milk products, unless the standardized milk or milk product is subsequently pasteurized.
10. Reconstituted or recombined milk and milk products shall be pasteurized after reconstitution or recombining of all ingredients.

ITEM 16p. PASTEURIZATION AND ASEPTIC PROCESSING

Pasteurization shall be performed as defined in Section 1, Definition EE of this Ordinance. Aseptic processing shall be performed in accordance with 21 CFR 113, 21 CFR 108 and the Administrative Procedures of Item 16p, sub-items (C), (D) and (E) of this Section. (Refer to Appendix L.)

In all cases, except for the specific exemptions provided for in ADMINISTRATIVE PROCEDURES, #2, pasteurization of raw milk or milk product shall be performed before the raw milk or milk product enters the reverse osmosis (RO), ultra-filtration (UF), evaporator or condensing equipment and shall be performed in the milk plant where the processing is done. All condensed milk and milk products transported to a milk plant for drying shall be re-pasteurized at the milk plant at which it is dried. If condensed whey containing at least forty percent (40%) total solids, has been partially crystallized by cooling, it may be transported to a separate milk plant for drying without re-pasteurization, provided the following conditions are complied with:

1. The condensed, partially crystallized whey is cooled and maintained at 7°C (45°F) or less.
2. Milk tank trucks, dedicated to hauling pasteurized product, shall be used to transport the condensed, partially crystallized whey and shall be washed and sanitized immediately prior to filling and then sealed after filling until unloading.
3. Separate unloading pumps and pipelines shall be provided and used only for the unloading of the condensed, partially crystallized whey. Such pumps and pipelines shall be cleaned and sanitized as a separate cleaning circuit.

PUBLIC HEALTH REASON

Health officials unanimously agree upon the public health value of pasteurization. Long experience conclusively shows its value in the prevention of disease that may be transmitted through milk. Pasteurization is the only practical, commercial measure, which if properly applied to all milk, will destroy all milk borne disease organisms. Examination of lactating animals and milk handlers, while desirable and of great value, can be done only at intervals and; therefore, it is possible for pathogenic bacteria to enter the milk for varying periods before the disease condition is discovered. Disease bacteria may also enter milk accidentally from other sources, such as flies, contaminated water, utensils, etc. It has been demonstrated that the time-temperature combinations specified by this Ordinance, if applied to every particle of milk or milk product will devitalize all milk borne pathogens. Compilations of outbreaks of milk borne disease by the USPHS/FDA, over many years, indicate that the risk of contracting disease from raw milk is approximately fifty (50) times as great as from milk that has been "pasteurized".

A note of caution is in order. Although pasteurization destroys the organisms, it does not destroy the toxins that may be formed in milk and milk products when certain staphylococci are present, as from udder infections, and when the milk or milk product is not properly refrigerated before pasteurization. Such toxins may cause severe illness. Aseptic processing has also been conclusively demonstrated to be effective in preventing outbreaks from milk borne pathogens. Numerous studies and observations clearly prove that the food value of milk is not significantly impaired by pasteurization.

ADMINISTRATIVE PROCEDURES

The pasteurization portion of this Item is deemed to be satisfied when:

1. Every particle of milk or milk product is heated in properly designed and operated equipment that meets the requirements of this Item and Appendix H., to one of the temperatures specified in the following table and held continuously at or above that temperature for at least the time specified:

Temperature	Time
63°C (145°F) *	30 minutes
72°C (161°F) *	15 seconds
89°C (191°F)	1.0 second
90°C (194°F)	0.5 seconds
94°C (201°F)	0.1 seconds
96°C (204°F)	0.05 seconds
100°C (212°F)	0.01 seconds

2. *If the fat content of the milk product is 10 percent (10%) or more, or if it contains added sweeteners, or is concentrated (condensed), the specified temperature shall be increased by 3°C (5°F).

3. Provided, that eggnog shall be heated to at least the following temperature and time specifications:
- 4.

Table 3. Pasteurization Temperature vs. Time (continued)	
Temperature	Time
69°C (155°F)	30 minutes
80°C (175°F)	25 seconds
83°C (180°F)	15 seconds

5. Provided further, that nothing shall be construed as barring any other pasteurization process, which has been recognized by FDA to be equally efficient and which is approved by the Regulatory Agency.
6. All milk and milk products shall be pasteurized, prior to the entrance into RO, UF, evaporator or condensing equipment, and shall be performed in the milk plant where the processing is done, except that:
 - a. If the product is whey, pasteurization is not required, provided:
 1. (1) The product is acid whey (pH less than 4.7); or
 2. (2) It is processed in RO or UF equipment at temperatures at or below 7°C (45°F).
 - b. If the product is raw milk for pasteurization, the product may be concentrated by the use of RO or UF membrane filtration without pasteurization, prior to entrance into the equipment, provided the following sampling, testing, design, installation and operational criteria are met:
 1. (1) Prior to processing, all raw milk supplies are sampled and tested for antibiotic residues in accordance with the provisions of Appendix N.;
 2. (2) The RO or UF filtration system is designed and operated to assure that milk or milk product temperature is maintained at or below 7°C (45°F) throughout the process;
 3. (3) The RO or UF system must be equipped with temperature monitoring and recording devices that comply with the applicable specifications outlined in Appendix E. of this Ordinance. At a minimum, milk or milk product temperature shall be monitored and recorded prior to entering the system, prior to entering each stage of the modules in series that contains cooling, and prior to any final cooler; and
 4. (4) If the RO or UF system is not designed, installed and operated in accordance with the above noted criteria, the raw milk or milk product must be pasteurized prior to entering the RO or UF system.
7. All condensed milk and milk products transported to a milk plant for drying shall be re-pasteurized at the milk plant where it is dried.
8. If condensed whey containing at least forty percent (40%) total solids, has been partially crystallized by cooling, it may be transported to a separate milk plant for drying without re-pasteurization, provided the following conditions are complied with:

- a. The condensed, partially crystallized whey is cooled and maintained at 7°C (45°F) or less.
 - b. Milk tank trucks used to transport the condensed, partially crystallized whey, shall be washed and sanitized immediately prior to filling and are sealed after filling until unloading.
 - c. Separate unloading pumps and pipelines shall be provided and used only for the unloading of the condensed, partially crystallized whey. Such pumps and pipelines shall be cleaned and sanitized as a separate cleaning circuit.
9. The design and operation of pasteurization equipment and all appurtenances thereto shall comply with the applicable specifications and operational procedures of Subitems (A), (B), (D) and (E).

ITEM 16p.(A) BATCH PASTEURIZATION

All indicating and recording thermometers used in connection with the batch pasteurization of milk or milk products shall comply with the applicable specifications set forth in Appendix H. Specifications for test thermometers and other test equipment appear in Appendix I.

PUBLIC HEALTH REASON

Unless the temperature-control instruments and devices used on pasteurization equipment are accurate within known limits, there can be no assurance that the proper pasteurization temperature is being applied. Pasteurization must be performed in equipment, which is properly designed and operated and which insures that every particle of milk or milk product will be held continuously at the proper temperature for the specified period of time.

Recording thermometers are the only known means for furnishing the Regulatory Agency with a record of the time and temperature of pasteurization. Experience has shown that recording thermometers, due to their mechanical complexity, are not entirely reliable. Therefore, mercury indicating thermometers or equivalent, which are much more reliable, are needed to provide a check on the recording thermometer and assurance that proper temperatures are being applied.

The recording thermometer shows the temperature of the milk or milk product immediately surrounding its bulb, but cannot indicate the temperature of the milk or milk product in other portions of the batch pasteurizer. Similarly, it shows the holding time in manual-discharge vats, but not in automatic-discharge systems. The pasteurizer must; therefore, be so designed and so operated and, where necessary, provided with such automatic controls, as to assure that every portion of the milk or milk product will be subjected to the proper temperature for the required length of time.

Unless the outlet valve and connections to the vats are properly designed and operated, cold pockets of milk or milk product may be held in the outlet valve or pipeline and raw or incompletely pasteurized milk or milk product may leak into the outlet line during the filling, heating or holding period.

Tests have shown that when foam is present on milk or milk product in vats or pockets during pasteurization, the temperature of the foam may be well below the pasteurization temperature. In such cases, pathogenic organisms that may be in the foam will not be killed. Experience indicates that some foam is present at some time in all vats, particularly at certain seasons. Furthermore, in filling vats, milk or milk product frequently is splashed on the surfaces and fixtures above the milk or milk product

level, as well as on the underside of the vat cover. Droplets of this splash may drop back into the body of the milk or milk product, and since they may not have been at pasteurization temperature for the required time, they may contain pathogenic organisms. Heating the air above the milk or milk product, above pasteurization temperature, remedies these conditions. When air heating is not provided, its need may frequently be demonstrated by swabbing milk or milk product from the upper vat walls and from the underside of the cover, at the end of the holding period, and running phosphatase tests on the swab samples.

Many milk plant operators have reported that the use of airspace heaters, especially with partly filled vats with un-insulated lids, makes it easier to maintain the milk or milk product at a uniform and sufficiently high temperature. It also helps to prevent the growth of thermophilic organisms and promotes easier cleaning.

Obviously, if the design and construction of pasteurization vats and pocket covers do not prevent leakage, condensation and the entrance of water and dust, the milk or milk product may become contaminated with material containing disease bacteria. Keeping the covers closed during operation will decrease the chance of contaminants such as dust, insects, drip and splash from entering the milk or milk product.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. TIME AND TEMPERATURE CONTROLS FOR BATCH PASTEURIZERS:

- a. Temperature Difference: The pasteurizer shall be so designed that the simultaneous temperature difference between the milk or milk product, at the center of the coldest milk or milk product in the vat, will not exceed 0.5°C (1°F) at any time during the holding period.

The vat shall be provided with adequate agitation, operating throughout the holding period. No batch of milk or milk product shall be pasteurized unless it covers a sufficient area of the agitator to insure adequate agitation.

- b. Location and Required Readings of Indicating and Recording Thermometers: Each batch pasteurizer shall be equipped with both an indicating and a recording thermometer.

The thermometers shall not read less than the required pasteurization temperature throughout the required holding period. The milk plant operator shall check the temperature shown by the recording thermometer against the temperature shown by the indicating thermometer at the start of the holding period. This comparison shall be noted on the recording thermometer chart. The recording thermometer shall not read higher than the indicating thermometer. No batch of milk or milk product shall be pasteurized unless it is sufficient to cover the bulbs of both the indicating and the recording thermometer.

- c. Assurance of Minimum Holding Periods: Batch pasteurizers shall be so operated that every particle of milk or milk product will be held at not less than the minimum pasteurization temperature continuously for at least thirty (30) minutes. When milk or milk products are raised to pasteurization temperature in the vat, and cooling is begun in the vat simultaneously with or before the opening of the outlet valve, the recording

chart shall show at least thirty (30) minutes, at not less than minimum pasteurization temperature. When milk or milk products are preheated to pasteurization temperature before entering the vat, the recording chart shall show a holding period of at least thirty (30) minutes, at not less than the minimum pasteurization temperature plus the time of filling from the level of the recording thermometer bulb. When cooling is begun in the batch pasteurizer, after opening the outlet valve, or is done entirely outside the batch pasteurizer, the recording chart shall show at least thirty (30) minutes at not less than the minimum pasteurization temperature plus the time of emptying to the level of the recording thermometer bulb.

When the recording time interval on the recording chart at the pasteurization temperature includes filling and/or emptying time, such intervals shall be indicated on the recording chart, by the operator, by removing the recording thermometer bulb from the milk or milk product for a sufficient time to depress the pen; or by turning cold water into the vat jacket at the end of the holding period; or by inscribing the holding time on the recording chart. The filling time and the emptying time for each batch pasteurizer, so operated, shall be determined by the Regulatory Agency, initially and after any change, which may affect these times.

No milk or milk product shall be added to the batch pasteurizer after the start of the holding period.

2. AIRSPACE HEATING:

- a. Means shall be provided and used in batch pasteurizers to keep the atmosphere above the milk or milk product at a temperature not less than 3°C (5°F) higher than the minimum required temperature of pasteurization, during the holding period. (Refer to Appendix H.)
- b. Each batch pasteurizer shall be equipped with an airspace thermometer. The surface of the milk or milk product shall be at least 25 millimeters (1 inch) below the bottom of the thermometer bulb when the vat is in operation.
- c. The temperature shown by the airspace thermometer shall be recorded on the recording thermometer chart at the start of the holding period and at the end of the holding period, at a given time or reference point as indicated on the recording chart.

3. INLET AND OUTLET VALVES AND CONNECTIONS:

The following definitions shall apply to inlet and outlet valves and connections:

- a. "Valve Stop" shall mean a guide which permits turning the valve plug to, but not beyond, the fully closed position.
- b. "The Fully Open Position" shall mean that position of the valve seat that permits the maximum flow into or out of the pasteurizer.
- c. "The Closed Position" shall mean any position of the valve seat that stops the flow of milk into or out of the pasteurizer.
- d. "The Fully Closed Position" shall mean that closed position of the valve seat which requires the maximum movement of the valve to reach the fully open position.
- e. "The Just-Closed Position" shall mean that closed position of a plug-type valve in which the flow into or out of the holder is barely stopped, or any position within 2

millimeters (0.078 inches) thereof as measured along the maximum circumference of the valve seat.

- f. "Leakage" shall mean the entrance of unpasteurized milk or milk product into a batch pasteurizer during the holding or emptying period, or the entrance of unpasteurized milk or milk product into any pasteurized milk or milk product line at any time.
- g. "Leak-Protector Valve" shall mean a valve provided with a leak-diverting device, which when the valve is in any closed position, will prevent leakage of milk or milk product past the valve.
- h. "Close-Coupled Valve" shall mean a valve, the seat of which is either flush with the inner wall of the pasteurizer or so closely coupled that no milk or milk product in the valve is more than 0.5°C (1°F) colder than the milk or milk product at the center of the pasteurizer at any time during the holding period.

A close-coupled valve, which is not truly flush, shall be considered as satisfying this requirement when:

- 1. (1) The vat outlet is so flared that the smallest diameter of the large end of the flare is not less than the diameter of the outlet line, plus the depth of the flare; and
- 2. (2) The greatest distance from the valve seat to the small end of the flare is not greater than the diameter of the outlet line; and
- 3. (3) In the case of batch pasteurizers, the outlet and the agitator are so placed as to insure that milk or milk product currents will be swept into the outlet.

4. DESIGN AND INSTALLATION OF VALVES AND CONNECTIONS:

All valves and connections shall comply with the following requirements:

- a. Valves and pipeline connections shall meet the requirements of Item 10p.
- b. All pipelines and fittings shall be so constructed and so located that leakage will not occur.
- c. To prevent clogging, and to promote drainage, all leak-protection grooves in plug-type outlet valves shall be at least 5 millimeters (0.187 inches wide) and at least 2.3 millimeters (0.094 inches) deep at the center. Mating grooves shall provide these dimensions throughout their combined length, whenever the valve is in, or approximately in, the fully closed position. All single leak grooves, and all mating leak grooves when mated, shall extend throughout the entire depth of the seat, so as to divert leakage occurring at all points throughout the depth of the seat and so as to prevent air binding. Washers or other parts shall not obstruct leak-protector grooves.
- d. A stop shall be provided on all plug-type outlet valves in order to guide the operator in closing the valve so that unpasteurized milk or milk product may not inadvertently be permitted to enter the outlet line. The stop shall be so designed that the plug will be irreversible when the plug is provided with any grooves or their equivalent, unless duplicate, diametrically opposite grooves are also provided. Stops shall be so designed that the operator cannot turn the valve beyond the stop position, either by raising the plug or by any other means.

- e. Outlet valves, in addition to the requirements listed above, shall be so designed as to prevent the accumulation of unpasteurized milk or milk product in the milk or milk product passages of the valve when the valve is in any closed position.
- f. All outlets from vat pasteurizers shall be equipped with close-coupled leak-protector valves or be otherwise similarly protected during filling, holding and emptying periods.
- g. All leak-protector grooved outlet valves shall be installed in the proper position to insure the function of the leak-protector grooves and the drainage of the leak-detector valve.
- h. All outlet valves shall be kept fully closed during filling, heating, and holding periods.
- i. Close-coupled vat pasteurizer outlet valve bodies and plugs shall be made of stainless steel or of other materials that have heat transfer properties at least equal to stainless steel.
- j. All inlet pipelines are disconnected during the holding and emptying periods.

5. RECORDING CHARTS:

All recording thermometer charts shall comply with all the applicable requirements of Item 16p(E)1.a.

ITEM 16p.(B) HIGH-TEMPERATURE-SHORT-TIME (HTST) CONTINUOUS-FLOW PASTEURIZATION

PUBLIC HEALTH REASON

(Refer to the Public Health Reason under Item 16p and 16p(A))

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. INDICATING THERMOMETERS AND RECORDER/CONTROLLER INSTRUMENTS:
All indicating thermometers and recorder/controller instruments and devices used in connection with the HTST, continuous-flow pasteurization of milk or milk products shall comply with the applicable specifications set forth in Appendix H.
2. AUTOMATIC MILK CONTROLLER:
Each HTST, continuous-flow pasteurization system shall be equipped with an automatic milk-flow control of the diversion type, which complies with the following definition, specifications and performance requirements:
 - a. Automatic Milk or Milk Product-Flow Controls: The term "automatic milk or milk product-flow controls" shall mean those safety devices which control the flow of milk or milk product in relation to the temperature of the milk or milk product or heating medium and/or pressure, vacuum or other auxiliary equipment. Milk or milk product-flow controls shall not be considered as part of the temperature control equipment. Milk or milk product-flow controls shall be of the flow-diversion type, which automatically cause the diversion of the milk or milk product in response to a sub-legal pasteurization temperature. At sub-legal temperatures, FDDs return the milk or milk product to the

raw milk or milk product side of the heating system continuously until legal pasteurization temperatures are obtained, at which time, the device restores forward-flow through the pasteurizer.

- b. FDDs: All FDDs used in continuous pasteurizers shall comply with the following or equally satisfactory specifications:
 1. (1) The forward-flow of milk or milk product below the minimum pasteurization temperature shall be prevented by requiring the timing pump to be de-energized when the milk or milk product is below the pasteurization temperature and the valve is not in the fully diverted position; or by any other equally satisfactory means.
 2. (2) When a packing gland is used to prevent leakage around the actuating stem, it shall be impossible to tighten the stem-packing nut to such an extent as to prevent the valve from assuming the fully diverted position.
 3. (3) A leak-escape shall be installed on the forward-flow side of the valve seat. However, when backpressure is exerted on the forward-flow side of the valve seat, while the milk or milk product-flow is being diverted, the leak-escape should lie between two valve seats or between two portions of the same seat, one upstream and the other downstream from the leak-escape. The leak-escape shall be designed and installed to discharge all leakage to the outside, or to the constant-level tank through a line separate from the diversion line. Provided, that when leakage is discharged to the constant-level tank, a sight glass shall be installed in the leak-escape line to provide a visual means of leak detection.
 4. (4) The closure of the forward-flow seat shall be sufficiently tight so that leakage past it will not exceed the capacity of the leak-escape device, as evidenced when the forward-flow line is disconnected; and, in order that proper seating may not be disturbed, the length of the connecting rod shall not be adjustable by the user.
 5. (5) The FDD shall be so designed and installed that failure of the primary motivating power shall automatically divert the flow of milk or milk product.
 6. (6) The FDD shall be located downstream from the holder. The flow-control sensor shall be located in the milk or milk product line not more than 46 centimeters (18 inches) upstream from the FDD.
 7. (7) The FDD may be located downstream from the regenerator and/or cooler section, provided, that when the FDD is located downstream from the regenerator and/or cooler section, the FDD shall be automatically prevented from assuming the forward-flow position until all product-contact surfaces between the holding tube and FDD have been held at or above the required pasteurization temperature continuously and simultaneously for at least the required pasteurization time as defined in Definition EE of this Ordinance.
 8. (8) The pipeline from the diversion port of the FDD shall be self-draining and shall be free of restrictions or valves; unless such restrictions are noticeable and valves are so designed that stoppage of the diversion line cannot occur. In the case of HHST systems, which have the FDD located downstream from the regenerator and/or cooler and are inter-wired or are computer controlled to thoroughly clean the system, including the divert pipeline before the re-starting of production, a cooling section, which is not self-draining, may be present in the divert pipeline.

9. (9) When it is used, the pipeline from the leak-detector port of the FDD shall be self-draining and shall be free of restrictions or valves.
 10. (10) For the timing pump, a one (1) second maximum "off" time delay is allowed to maintain the flow-promoting device in the "on" position through the travel time of the FDD.
 11. (11) If the area between the divert and leak-detect valve seats is not self-draining when the FDD is in the diverted position, a delay of at least one (1) second and not more than five (5) seconds is required between the movement of the divert and leak-detect valves when the FDD assumes the forward-flow position. Except that, the delay may be longer than five (5) seconds if: the timing system is a magnetic flow meter based timing system; or if the holding time in diverted-flow through an unrestricted divert valve line is longer than the required pasteurization time as specified in Definition EE of this Ordinance; and except that, no time delay is required in pasteurization systems in which the FDD is located downstream from the pasteurized regenerator and in which all forward-flow product-contact surfaces of the FDD are sanitized, or sterilized during the normal start-up process.
 12. (12) In the case of HHST pasteurizing systems utilizing temperatures and holding times to meet the UP definition of this Ordinance, the FDD may be located downstream of the regenerator and/or cooler section. Said FDD may alternatively be a system of the "Steam-Block Type" as described in Appendix H. This FDD system shall allow for the flow of water and/or milk or milk product to the constant-level tank through appropriate valves and coolers during sterilization and when diverted.
- c. Milk or Milk Product-Flow Controller Instrumentation: The following requirements shall be met with respect to the instrumentation of the milk or milk product-flow controller:
1. (1) The thermal-limit-controller shall be set and sealed so that forward-flow of milk or milk product cannot start unless the temperature at the controller sensor is above the required pasteurization temperature as defined in Definition EE of this Ordinance for the milk or milk product, and the process used, nor continue during descending temperatures when the temperature is below the required pasteurization temperature. The seal shall be applied by the Regulatory Agency after testing, and shall not be removed without immediately notifying the Regulatory Agency. The system shall be so designed that no milk or milk product can be bypassed around the controller sensor that shall not be removed from its proper position during the pasteurization process. The cut-in and cut-out milk or milk product temperatures, as shown by the indicating thermometer, shall be determined at the beginning of each day's operation and entered upon the recorder chart daily by the milk plant operator.
 2. (2) In the case of pasteurization systems, with the FDD located downstream from the regenerator and/or cooler section, additional temperature controllers and timers shall be inter-wired with the thermal-limit-controller, and the control system shall be set and sealed so that forward-flow of milk or milk product cannot start until all product-contact surfaces between the holding tube and FDD have been held at or above the required pasteurization temperature, continuously and simultaneously for at least the required pasteurization time as defined in Definition EE of this Ordinance. The control system shall also be set

and sealed so that forward-flow cannot continue when the temperature of the milk or milk product in the holding tube is below the required pasteurization temperature. Provided, that for systems used for the processing of milk or milk products labeled as UP, it is not necessary to set and seal the thermal-limit-controller at or above 138°C (280°F). Also, provided that these systems shall meet all the public health control requirements for HHST systems, and that the recorder-controller chart shows that the UP milk or milk product has been processed at a minimum temperature of 138°C (280°F), and has been verified by the Regulatory Agency to have a calculated holding time of at least two (2) seconds. The seal, if required, shall be applied by the Regulatory Agency after the equipment has been tested, and shall not be removed without immediately notifying the Regulatory Agency. The system shall be so designed that no milk or milk product can be bypassed around the control sensors, which shall not be removed from their proper position during the pasteurization process. For these pasteurization systems, daily measurement by the operator of the cut-in and cut-out temperatures is not required.

3. (3) Manual switches for the control of pumps, homogenizers or other devices, which produce flow through the holder, shall be wired so that the circuit is completed only when milk or milk product is above the required pasteurization temperature as defined in Definition EE of this Ordinance for the milk or milk product and the process used, or when the FDD is in the fully-diverted position.

d. Holding Tube:

1. (1) Holding tubes shall be designed to provide for the holding of every particle of the milk or milk product for at least the time required in Definition EE of this Ordinance for the milk or milk product and the process used.
2. (2) The holding tube shall be so designed that the simultaneous temperature difference between the hottest and coldest milk or milk product, in any cross section of flow, at any time during the holding period, will not be greater than 0.5°C (1°F). This requirement may be assumed to have been satisfied, without testing, in tubular holders of 17.8 centimeters (7 inches) or smaller diameter that are free of any fittings through which the milk or milk product may not be thoroughly swept.
3. (3) No device shall be permitted for short-circuiting a portion of the holding tube to compensate for changes in rate of milk or milk product-flow. Holding tubes shall be installed so that sections of pipe cannot be left out, resulting in a shortened holding time.
4. (4) The holding tube shall be arranged to have a continuously upward slope in the direction of flow of not less than 2.1 centimeters per meter (0.25 inches per foot).
5. (5) Supports for holding tubes shall be provided to maintain all parts of the holding tubes in a fixed position, free from any lateral or vertical movement.
6. (6) The holding tube shall be so designed that no portion between the inlet and the recorder-controller temperature sensor is heated.
7. The following Items apply to HHST systems:

(7) The holding time for HHST systems must be determined from the pumping rate rather than by the salt conductivity test, because of the short holding tube.

The holding tube length must be such that the fastest flowing particle, of any milk or milk product, will not traverse the holding tube in less than the required holding time. Since laminar flow, the fastest flowing particle travels twice as fast as the average flowing particle, can occur in the holding tube during pasteurization of high-viscosity milk or milk products, holding tube lengths are calculated as twice the length required to hold the average flow for the time standard.

8. (8) With the direct steam heating processes, the holding time is reduced because the milk or milk product volume increases as the steam condenses to water during heating in the injector. This surplus water is evaporated as the pasteurized milk or milk product is cooled in the vacuum chamber. For example, with a 66°C (120°F) increase by steam injection, which is probably the maximum temperature rise that will be used, a volume increase of twelve percent (12%) will occur in the holding tube. The measurement of the average flow rate, at the discharge of the pasteurizer, does not reflect this volume increase in the holding tube. However, this volume increase, i.e., holding time decrease, must be considered in the calculations.
9. (9) For those HHST systems capable of operating with less than 518 kPa (75 psig) pressure in the holding tube, a pressure limit indicator/pressure switch must be interwired so that the FDD will move to the divert position if the milk or milk product pressure falls below a prescribed value. For operating temperatures between 89°C (191°F) and 100°C (212°F) the instrument must be set at 69 kPa (10 psi). To prevent vaporization in the holding tube, which may substantially reduce residence times, HHST systems operating above 100°C (212°F), the instrument must be set at 69 kPa (10 psi) above the boiling pressure of the product, at its maximum temperature in the holding tube.
10. (10) With the steam injection process, a differential pressure limit indicator across the injector is needed to keep the heated milk or milk product in the liquid phase and to ensure adequate isolation of the injection chamber. The instrument must have a differential pressure switch so that the FDD will move to the divert position if the pressure drop across the injector falls below 69 kPa (10 psi).

e. Indicating and Recording Thermometers:

1. (1) An indicating thermometer shall be located as near as practicable to the temperature sensor of the recorder/controller, but may be located a short distance upstream from the latter where milk or milk product between the two thermometers does not differ significantly in temperature.
2. (2) The temperature shown by the recorder/controller shall be checked daily by the milk plant operator against the temperature shown by the indicating thermometer. Readings shall be recorded on the chart. The recorder/controller shall be adjusted to read no higher than the indicating thermometer.
3. (3) The recorder/controller charts shall comply with the applicable provisions of Item 16p(E)1.a.

f. Flow-Promoting Devices:

1. (1) The pump or pumps and other equipment which may produce flow through the holding tube shall be located upstream from the holding tube, provided that

pumps and other flow-promoting devices may be located downstream from the holding tube, if means are provided to eliminate negative pressure between the holding tube and the inlet to such equipment. When vacuum equipment is located downstream from the holding tube, an effective vacuum breaker, plus an automatic means of preventing a negative pressure in the line between the FDD and the vacuum chamber, shall be acceptable.

2. (2) The speed of pumps or other flow-promoting devices, governing the rate of flow through the holding tube, shall be so controlled as to insure the holding of every particle of milk or milk product for at least the time required as defined in Definition EE of this Ordinance for the milk or milk product and the process used. In all cases, the motor shall be connected to the timing pump by means of a common drive shaft, or by means of gears, pulleys, or a variable-speed drive, with the gear box, the pulley box or the setting of the variable speed protected in such a manner that the holding time cannot be shortened without detection by the Regulatory Agency. This shall be accomplished by the application of a suitable seal(s) after being tested by the Regulatory Agency and such seal(s) shall not be broken without immediately notifying the Regulatory Agency. This provision shall also apply to all homogenizers used as timing pumps. Variable speed drives, used in connection with the timing pump, shall be so constructed that wearing or stretching of the belt results in a slowdown, rather than a speedup, of the pump.

The metering or timing pump shall be of the positive-displacement type or shall comply with the specifications for magnetic flow meter based timing systems as outlined in Appendix H. Timing pumps and homogenizers, when used as a timing pump, shall not have by-pass lines connected from their outlet pipelines to their inlet pipelines during processing if an additional flow-promoting or vacuum producing device is located within the system. When a homogenizer is used in conjunction with a timing pump it shall be either:

1. i) Of larger capacity than the timing pump: In which case, an unrestricted, open, recirculation line shall be used to connect the outlet pipeline from the homogenizer to its inlet line. The recirculation line must be of at least the same or larger diameter than the inlet pipeline feeding milk or milk product to the homogenizer. A check-valve, allowing flow from the outlet line to the inlet line, may be used in the recirculating line, provided it is of the type which provides a cross-sectional area at least as large as the recirculating line.
2. ii) Of smaller capacity than the timing pump: In which case, a relief line and valve shall be used. Such relief line shall be located after the timing pump and before the inlet to the homogenizer and shall return milk or milk product to the constant-level tank or to the outlet of the constant-level tank, upstream of any booster pump or other flow-promoting device.

For those systems that do not homogenize all milk or milk products and wish to utilize a by-pass line to by-pass the homogenizer while processing such milk or milk product, the by-pass line must be connected with valves that are so designed that both lines cannot be open at the same time. This may be accomplished with three (3)-way plug valves with properly

designed and operating pins or other automatic, fail-safe valves that accomplish the same objective.

3. (3) The holding time shall be taken to mean the flow time of the fastest particle of milk or milk product at or above the required pasteurization temperature as defined in Definition EE of this Ordinance for the milk or milk product and the process used, throughout the holding tube section; i.e., that portion of the system that is outside of the influence of the heating medium, slopes continuously upward in the downstream direction and is located upstream from the FDD. Tests for the holding time shall be made when all equipment and devices are operated and adjusted to provide for maximum flow. When a homogenizer is located upstream from the holding tube, the holding time shall be determined with the homogenizer in operation with no pressure on the homogenizer valves.

For those systems which do not homogenize all milk or milk products and utilize by-pass lines as outlined in f.(2)(i) above, the holding time shall be tested in both flow patterns and the fastest time used. The holding time shall be tested during both forward and diverted-flow. If it is necessary to lengthen the holding time during diverted-flow, an identifiable restriction may be placed in the vertical portion of the diversion pipeline. When vacuum equipment is located downstream from the holding tube, the holding time shall be tested with the timing pump operating at maximum flow and the vacuum equipment adjusted to provide for the maximum vacuum. The holding time shall be tested in both forward and diverted-flow by the Regulatory Agency initially; semiannually thereafter; after any alteration or replacement that may affect the holding time; and whenever the seal of the speed setting has been broken.

- g. Heating by Direct Addition of Steam: Steam injection is an inherently unstable process; accordingly, when steam is injected into a fluid, condensation of the steam may not be completed inside the injector unless the proper design criteria are used. Lack of complete condensation inside the injector would cause temperature variations in the holding tube that could lead to some milk or milk product particles being processed below pasteurization temperature. When culinary steam is injected directly into milk or milk product, as the means of terminal heating to achieve pasteurization temperature, the steam injector shall be designed, installed and operated to comply with the following or equally satisfactory specifications:
 1. (1) The milk or milk product and steam flows must be isolated from pressure fluctuations inside the injection chamber. One (1) method of isolation is to insert supplementary orifices on the milk or milk product inlet and the heated milk or milk product outlet of each injector. The two (2) supplementary orifices must be sized for at least a 69 kPa (10 psi) milk or milk product pressure drop across the injector during a simulation of normal operations. Excessive vibrations, pressure fluctuations or erratic noise levels indicate an unstable steam injection system and a need to check the isolation of the injection chamber.
 2. (2) The process should be as free as possible of non-condensable gases that may evolve from the product or be carried in the steam supply. Any two-phase flow caused by the non-condensable gases would displace the product in the holding tube, resulting in reduced residence times. In addition, these gases in the steam supply may also markedly alter the condensation mechanism at the point of

injection. Accordingly, the steam boiler shall be supplied with a de-aerator. The de-aerator will aid in keeping the product in the holding tube as free as possible of non-condensable gases.

h. Prevention of Milk or Milk Product Adulteration with Added Water:

1. (1) When culinary steam is introduced directly into the milk or milk product, downstream from the FDD, means shall be provided to preclude the addition of steam to the milk or milk product, unless the FDD is in the forward-flow position. This provision may be satisfied by the use of an automatic steam control valve with a temperature sensor located downstream from the steam inlet, or by the use of an automatic solenoid valve installed in the steam line and so wired through the FDD controls, so that steam cannot flow unless the FDD is in the forward-flow position.
2. (2) When culinary steam is introduced directly into the milk or milk product, automatic means, i.e., stand-alone and/or PLC-based ratio control system, shall be provided to maintain a proper temperature differential between incoming and outgoing milk or milk product to preclude dilution with water.
3. (3) Where a water feed line is connected to a vacuum condenser and the vacuum condenser is not separated from the vacuum chamber by a physical barrier, means shall be provided to preclude the backup and overflow of water from the vacuum condenser to the vacuum chamber. This provision may be satisfied by the use of a safety shutoff valve, located on the water feed line to the vacuum condenser, which is automatically actuated by a control, which will shut off the in-flowing water, if for example, the condensate pump stops and the water level rises above a predetermined point in the vacuum condenser. This valve may be actuated by water, air or electricity and shall be so designed that failure of the primary motivating power will automatically stop the flow of water into the vacuum condenser.

ITEM 16p.(C) ASEPTIC PROCESSING SYSTEMS

PUBLIC HEALTH REASON

Aseptically processed milk and milk products are being packaged in hermetically sealed containers and stored for long periods of time under non-refrigerated conditions. These conditions are favorable to the growth of many types of bacteria, including pathogenic, toxin producing and spoilage organisms. Because of this, every precaution must be taken to ensure that the chosen heat process, for the particular milk or milk product, destroys all viable organisms and their spores. The subsequent handling, packaging and storage processes do not provide an opportunity for recontamination of the milk or milk product. The selected process must conform to the acceptable requirements for low acid canned foods.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

The design and operation of aseptic processing systems comply with the applicable specifications and operational procedures of Item 16p, sub-items (C), (D) and (E). Provided, that nothing shall be

construed as barring any other aseptic processing system which have been recognized by FDA to be equally effective and which is approved by the Regulatory Agency.

1. INDICATING THERMOMETERS AND RECORDER/CONTROLLER INSTRUMENTS:
All indicating thermometers, recorder/controller instruments and devices, used in connection with aseptic processing systems, used for the aseptic processing of milk or milk products shall comply with the applicable specifications set forth in Appendix H.
2. ASEPTIC PROCESSING EQUIPMENT:
 - a. Temperature Indicating Device: Each aseptic processing system shall be equipped with at least one (1) mercury-in-glass thermometer or an equivalent temperature-indicating device.
 - b. Temperature Recorder/Controller: An accurate temperature recorder/controller shall be installed in the milk or milk product at the holding tube outlet and before the inlet to the cooler or regenerator. The following requirements shall be met with respect to the instrumentation of the temperature recorder/controller:
 1. (1) The temperature recorder/controller shall be set and sealed so that during milk or milk product processing the forward-flow of milk or milk product cannot start unless the temperature at the controller sensor is above the required temperature for the milk or milk product and the process used, nor continue during descending temperatures when the temperature is below the required temperature.

The seal shall be applied by the Regulatory Agency after testing and shall not be removed without immediately notifying the Regulatory Agency. The system shall be so designed that no milk or milk product can be bypassed around the controller sensor, which shall not be removed from its proper position during the processing of aseptic milk and milk products.

2. (2) Additional temperature-controllers and timers shall be interwired with the thermal-limit controller, and the control system shall be set and sealed so that forward-flow of milk or milk product cannot start until all product-contact surfaces between the holding tube and FDD have been held at or above the required sterilization temperature, continuously and simultaneously for at least the required sterilization time. The control system shall also be set and sealed so that forward-flow cannot continue when the temperature of the milk or milk product in the holding tube is below the required temperature. The seal shall be applied by the Regulatory Agency after being tested and shall not be removed without immediately notifying the Regulatory Agency. The system shall be so designed that no milk or milk product can be bypassed around the control sensors, which shall not be removed from their proper position during the processing of aseptic milk and milk products.
3. (3) Manual switches for the control of pumps, homogenizers or other devices that produce flow through the holding tube, shall be wired so that the circuit is completed only when the milk or milk product is above the required temperature for the milk or milk product and the process used, or when the FDD is in the fully diverted position.

c. Timing Pump:

1. (1) A timing pump shall be located upstream from the holding tube and shall be operated to maintain the required rate of milk or milk product flow. The motor shall be connected to the timing pump by means of a common drive shaft, or by means of gears, pulleys or a variable-speed drive, with the gear box, the pulley box or the setting of the variable speed protected in such a manner that the hold time cannot be shortened without detection by the Regulatory Agency. This shall be accomplished by the application of a suitable seal(s) after being tested by the Regulatory Agency and such seal(s) shall not be broken without immediately notifying the Regulatory Agency. This provision shall apply to all homogenizers used as timing pumps. Variable speed drives, used in connection with the timing pump, shall be so constructed that wearing or stretching of the belt results in a slowdown, rather than a speedup, of the pump. The metering or timing pump shall be of the positive-displacement type or shall comply with the specifications for magnetic flow meter based timing systems.
2. (2) The holding time shall be taken to mean the flow time of the fastest particle of milk or milk product throughout the holding tube section, i.e., that portion of the system that is outside of the influence of the heating medium; and slopes continuously upward in the downstream direction; and is located upstream from the FDD.

d. Milk or Milk Product Holding Tube:

1. (1) The milk or milk product holding tube shall be designed to give continuous holding of every particle of milk or milk product for at least the minimum holding time specified in the scheduled process. The holding tube shall be designed, so that no portion of the holding tube between the milk or milk product inlet and the milk or milk product outlet can be heated. In addition, it must be sloped upward at least 2.1 centimeters per meter (0.25 inches per foot). Supports for holding tubes shall be provided to maintain all parts of the holding tubes in a fixed position, free from any lateral or vertical movement.
2. (2) No device shall be permitted for short-circuiting a portion of the holding tube to compensate for changes in rate of milk or milk product flow. Holding tubes shall be installed so that sections of pipe cannot be left out, resulting in a shortened holding time. The holding time for the processes must be determined from the pumping rate, rather than by the salt conductivity test.
3. (3) The holding tube length must be such that the fastest flowing particle of any milk or milk product will not traverse the holding tube in less than the required holding time.

NOTE: With the direct addition of steam, the holding time is reduced because the milk or milk product volume increases as the steam condenses to water during heating. This surplus water is evaporated as the aseptically processed milk or milk product is cooled in the vacuum chamber. For example, with a 66°C (120°F) increase by steam injection, which is probably the maximum temperature rise that will be used, a volume increase of twelve percent (12%) will occur in the holding tube. The measurement of the average flow rate at the discharge of the aseptic processor does not reflect this volume increase in the holding tube. However, this

volume increase, i.e., holding time decrease, must be considered in the calculations.

4. (4) An aseptic processing system which can operate with milk or milk product in forward-flow mode, with less than 518 kPa (75 psig) pressure in the holding tube shall be equipped with a pressure limit indicator/pressure switch in the holding tube to assure that the heated milk or milk product remains in the liquid phase. In systems that do not have a vacuum chamber between the holding tube and the aseptic milk or milk product side of the regenerator, this can be established by verifying that the aseptic processing equipment cannot operate in forward-flow with less than 518 kPa (75 psig) pressure on the aseptically processed side of the regenerator. (Refer to Appendix I., Test 9). The pressure limit indicator/pressure switch must be interwired so that the FDD, milk or milk product divert system, milk or milk product divert valve or other acceptable control system will move to the divert position, if the milk or milk product pressure falls below a prescribed value. The instrument must be set at a pressure 69 kPa (10 psi) above the boiling pressure of the milk or milk product at its maximum temperature in the holding tube. If this pressure is too low, the resultant vaporization in the holding tube will substantially reduce residence times.
 5. (5) With the steam injection process, a differential pressure limit indicator, across the injector, is needed to ensure adequate isolation of the injection chamber. The instrument must have a differential pressure switch so that the FDD will move to the divert position if the pressure drop across the injector falls below 69 kPa (10 psi).
- e. Heating by Direct Addition of Steam: Steam injection is an inherently unstable process; accordingly, when steam is injected into a fluid, condensation of the steam may not be completed inside the injector unless the proper design criteria are used. Lack of complete condensation inside the injector would cause temperature variations in the holding tube, which could lead to some milk or milk product particles being processed below filed process temperature. When culinary steam is injected directly into milk or milk products, as the means of terminal heating to achieve aseptic processing temperature, the steam injector shall be designed, installed and operated to comply with the following or equally satisfactory specifications:
1. (1) The milk or milk product and steam flows must be isolated from pressure fluctuations inside the injection chamber. One (1) method of isolation is to insert supplementary orifices on the milk or milk product inlet and the heated milk or milk product outlet of each injector. The two (2) supplementary orifices must be sized for at least a 69 kPa (10 psi) milk or milk product pressure drop across the injector during a simulation of normal operations. Excessive vibrations, pressure fluctuations or erratic noise levels indicate an unstable steam injection system and a need to check the isolation of the injection chamber.
 2. (2) The process should be as free as possible of non-condensable gases that may evolve from the milk or milk product or be carried in the steam supply. Any two (2) phase flow, caused by the non-condensable gases, would displace the milk or milk product in the holding tube, resulting in reduced residence times. In addition, these gases in the steam supply may also markedly alter the condensation mechanism at the point of injection. Accordingly, the steam boiler

shall be supplied with a de-aerator. The de-aerator will aid in keeping the milk or milk product in the holding tube as free as possible of non-condensable gases.

f. Prevention of Milk or Milk Product Adulteration with Added Water:

1. (1) When culinary steam is introduced directly into the milk or milk product, automatic means, i.e., stand-alone and/or PLC-based ratio control system, shall be provided to maintain a proper temperature differential between incoming and outgoing milk or milk products to preclude dilution with water.
2. (2) Where a water feed line is connected to a vacuum condenser and the vacuum condenser is not separated from the vacuum chamber by a physical barrier, means shall be provided to preclude the back-up and overflow of water from the vacuum condenser into the vacuum chamber. This provision may be satisfied by the use of a safety shutoff valve, located on the water feed line to the vacuum condenser that is automatically actuated by a control that shuts off the in-flowing water. This valve may be actuated by water, air or electricity and shall be so designed that failure of the primary motivating power will automatically stop the flow of water into the vacuum condenser.

- g. FDD: All FDDs used in continuous aseptic process systems shall comply with Item 16p(B)2.b. or equally satisfactory specifications.

ITEM 16p.(D) PASTEURIZERS AND ASEPTIC PROCESSING SYSTEMS EMPLOYING REGENERATIVE HEATING

PUBLIC HEALTH REASON

To prevent contamination of the pasteurized milk or milk product in regenerators, the raw milk or milk product must always be under less pressure than the pasteurized milk or milk product or the heat-transfer medium. In the case of milk or milk-to-milk or milk regenerators, this requirement is necessary to prevent contamination of the pasteurized milk or milk product by the raw milk or milk product if flaws should develop in the metal or joints separating the raw and pasteurized milk or milk product.

ADMINISTRATIVE PROCEDURES

This Item is deemed satisfied when:

MILK OR MILK PRODUCT-TO-MILK OR MILK PRODUCT REGENERATIVE HEATING

Pasteurizers and aseptic processing systems employing milk or milk product-to-milk or milk product regenerative heating with both sides closed to the atmosphere shall comply with the following or equally satisfactory specifications:

1. Regenerators shall be constructed, installed and operated so that pasteurized or aseptic milk or milk product in the regenerator will automatically be under greater pressure than raw milk or milk product in the regenerator at all times.
2. The pasteurized or aseptic milk or milk product, between its outlet from the regenerator and the nearest point downstream open to the atmosphere, shall rise to a vertical elevation of 30.5

- centimeters (12 inches) above the highest raw milk or milk product level, downstream from the constant-level tank, and shall be open to the atmosphere at this or a higher elevation.
3. The overflow of the top rim of the constant-level tank shall always be lower than the lowest milk or milk product level in the regenerator.
 4. No pump or flow-promoting device which can affect the proper pressure relationships within the regenerator shall be located between the pasteurized or aseptic milk or milk product outlet from the regenerator and the nearest downstream point open to the atmosphere.
 5. No pump shall be located between the raw milk or milk product inlet to the regenerator and the constant-level tank, unless it is designed and installed to operate only when milk or milk product is flowing through the pasteurized or aseptic milk or milk product side of the regenerator and when the pressure of the pasteurized or aseptic milk or milk product is higher than the maximum pressure produced by the pump. This may be accomplished by wiring the booster pump so that it cannot operate unless:
 - a. The timing pump is in operation;
 - b. The FDD is in forward-flow position; and
 - c. The pasteurized or aseptic milk or milk product pressure exceeds, by at least 6.9 kPa (1 psi), the maximum pressure developed by the booster pump. Pressure gauges shall be installed at the raw milk or milk product inlet to the regenerator and the pasteurized or aseptic milk or milk product outlet of the regenerator or the outlet of the cooler. The accuracy of these required pressure gauges shall be checked, by the Regulatory Agency, on installation; quarterly thereafter; and following repair or adjustment.
 6. The motor, casing and impeller of the booster pump shall be identified for those systems that rely on a pressure switch, located only on the pasteurized side, and such records maintained as directed by the Regulatory Agency.
 7. All electric wiring interconnections for the booster pump should be in permanent conduit, except that rubber covered cable may be used for final connections, with no electrical connections to defeat the purpose of any provisions of this Ordinance.
 8. All raw milk or milk product in the regenerator will drain freely back into the constant-level tank when the raw milk or milk product pump(s) are shut down and the raw milk or milk product outlet from the regenerator is disconnected.
 9. When vacuum equipment is located downstream from the FDD, means shall be provided to prevent the lowering of the pasteurized or aseptic milk or milk product level in the regenerator during periods of diverted-flow or shutdown. An effective vacuum breaker, plus an automatic means of preventing a negative pressure, shall be installed in the line between the vacuum chamber and the pasteurized or aseptic milk or milk product inlet to the regenerator.
 10. In the case of pasteurization systems, with the FDD located downstream from the regenerator and/or cooler section, the requirements of paragraphs (2), (3) and (8) of this Section may be eliminated. Provided, that a differential pressure controller is used to monitor the highest pressure in the raw milk or milk product side of the regenerator and the lowest pressure in the pasteurized side of the regenerator, and the controller is interlocked with the FDD and is set and sealed so that whenever improper pressures occur in the regenerator, forward-flow of milk or milk product is automatically prevented and will not start again until all milk or milk product-contact surfaces between the holding tube and FDD have been held at or above the required pasteurization temperature, continuously and simultaneously for at least the required pasteurization time as defined in Definition EE of this Ordinance.

In the case of aseptic processing systems used for producing aseptic milk and milk products, there shall be an accurate differential pressure recorder-controller installed on the regenerator. The scale divisions shall not exceed 13.8 kPa (2 psi) on the working scale of not more than 138 kPa (20 psi) per 2.54 centimeters (1 inch). The controller shall be tested for accuracy against a known accurate standard pressure indicator upon installation; at least once every three (3) months of operation thereafter; or more frequently if necessary, to ensure its accuracy. One (1) pressure sensor shall be installed at the aseptic milk or milk product regenerator outlet and the other pressure sensor shall be installed at the raw milk or milk product regenerator inlet.

11. When culinary steam is introduced directly into milk or milk product to achieve pasteurization or aseptic processing temperature, and vacuum equipment is located downstream from the holding tube, the requirement that a vacuum breaker be installed at the inlet to the pasteurized or aseptic side of the regenerator may be eliminated. Provided, that the differential pressure controller is installed and wired to control the FDD as described in Paragraph 10 of this Section.
12. When the differential pressure controller is installed and wired to control the FDD as described in Paragraph 10 of this Section, the raw milk or milk product booster pump may be permitted to run at all times. Provided, that the timing pump is in operation.

MILK OR MILK PRODUCT-TO-WATER-TO-MILK OR MILK PRODUCT REGENERATIVE HEATING

Option 1. Milk or milk product-to-water-to-milk or milk product regenerators, with both the milk or milk product and the heat-transfer water in the raw milk or milk product section, closed to the atmosphere, shall comply with the following or equally satisfactory specifications:

- a. Regenerators of this type shall be so designed, installed and operated that the heat-transfer-medium side of the regenerator, in the raw milk or milk product section, will automatically be under greater pressure than the raw milk or milk product side at all times.
- b. The heat-transfer water shall be a safe water and the heat-transfer water shall be in a covered tank, which is open to the atmosphere at an elevation higher, by at least 30.5 centimeters (12 inches), than any raw milk or milk product level downstream from the constant-level tank. The heat-transfer water between its outlet from the regenerator and the nearest point downstream open to the atmosphere shall rise to a vertical elevation of at least 30.5 centimeters (12 inches) above any raw milk or milk product in the system and shall be open to the atmosphere at this or a higher elevation.
- c. The heat-transfer water circuit shall be full of water at the beginning of the run and all loss of water from the circuit shall be automatically and immediately replenished whenever raw milk or milk product is present in the regenerator.
- d. The overflow of the top rim of the constant-level tank shall always be lower than the lowest milk or milk product level in the raw milk or milk product section of the regenerator. The regenerator shall be designed and installed so that all raw milk or milk product shall drain freely back to the upstream supply tank when the raw milk or milk product pumps are shut down and the raw milk or milk product line is disconnected from the regenerator outlet.
- e. No pump shall be located between the raw milk or milk product inlet to the regenerator and the constant-level tank, unless it is designed and installed to operate only when water is flowing through the heat-transfer section of the regenerator and when the pressure of the heat-transfer water is higher than the pressure of the raw milk or milk product. This may be accomplished by wiring the booster pump so that it cannot operate unless:

1. (1) The heat-transfer water pump is in operation; and
2. (2) The heat-transfer water pressure exceeds, by at least 6.9 kPa (1 psi), the raw milk or milk product pressure in the regenerator. A differential pressure-controller shall be installed at the raw milk or milk product inlet and the heat-transfer water outlet of the regenerator. The raw milk or milk product booster pump must be wired so that it cannot operate unless the differential pressure is met. The accuracy of the required differential pressure-controller shall be checked by the Regulatory Agency on installation; quarterly thereafter; and following repair or replacement.

Option 2. Milk or milk product-to-water-to-milk or milk product regenerators may also be constructed, installed and operated such that the pasteurized or aseptic milk or milk product in the regenerator will be under greater pressure than the heat-transfer-medium in the pasteurized or aseptic milk or milk product side of the regenerator:

- a. A differential pressure controller shall be used to monitor pressures of the pasteurized milk or milk product and the heat-transfer-medium.
- b. In the case of aseptic processing systems, a differential pressure-recorder shall be used to monitor pressures of the aseptic milk or milk product and the heat-transfer-medium.
- c. In either case, one pressure sensor shall be installed at the pasteurized or aseptic milk or milk product outlet of the regenerator and the other pressure sensor shall be installed at the heat-transfer-medium inlet of the pasteurized or aseptic milk or milk product side of the regenerator. This controller or recorder-controller shall divert the FDD whenever the lowest pressure of pasteurized or aseptic milk or milk product in the regenerator fails to exceed the highest pressure of the heat-transfer-medium in the pasteurized or aseptic milk or milk product side of the regenerator by at least 6.9 kPa (1 psi). Forward-flow of milk or milk product shall be automatically prevented until all milk or milk product-contact surfaces between the holding tube and the FDD have been held at or above the required pasteurization or sterilization temperature continuously and simultaneously for at least the pasteurization or sterilization time.
- d. The heat-transfer-medium pump shall be wired so that it cannot operate unless the timing pump is in operation.

NOTE: Refer to Appendix H. for further discussion concerning methods of achieving the required pressure relationships within the regenerator.

ITEM 16p.(E) PASTEURIZATION AND ASEPTIC PROCESSING RECORDS, EQUIPMENT TESTS AND EXAMINATIONS

1. PASTEURIZATION AND ASEPTIC PROCESSING RECORDS:

All temperature and flow rate pasteurization recording charts or alternative records, acceptable to FDA, in place of charts shall be preserved for a period of three (3) months. Provided, that all records and recording charts for aseptic milk and milk product systems shall be retained for a period of three (3) years. The use of such charts shall not exceed the time limit for which they are designed. Overlapping of recorded data shall be a violation of this Item. The following information shall be entered on the charts or other records acceptable to FDA in place of charts as applicable:

- a. Batch Pasteurizers:

1. (1) Date;
 2. (2) Number or location of recording thermometer when more than one is used;
 3. (3) A continuous record of the product temperature;
 4. (4) Extent of holding period, including filling and emptying times when required;
 5. (5) Reading of airspace thermometer, at the start of the holding period and at the end of the holding period, at a given time or reference point as indicated on the chart;
 6. (6) Reading of indicating thermometer, at the start of the holding period, at a given time or reference point as indicated on the chart;
 7. (7) Quarterly, the initials of the Regulatory Agency, or in the case of milk plants regulated under the NCIMS HACCP Program, a qualified industry person acceptable to the Regulatory Agency, opposite the required readings of the indicating thermometer and airspace thermometer
 8. (8) Quarterly, the time accuracy of the recording thermometer, as determined by the Regulatory Agency, or in the case of milk plants regulated under the NCIMS HACCP Program, a qualified industry person acceptable to the Regulatory Agency;
 9. (9) Amount and name of the pasteurized milk or milk product, represented by each batch or run on the chart;
 10. (10) Record of unusual occurrences;
 11. (11) Signature or initials of the operator; and
 12. (12) Name of the milk plant.
- b. HTST and HHST Pasteurizers: Recording thermometer charts shall contain all the information specified in Subitem a. above, except (4), (5) and reference to the airspace thermometer in (7), and in addition, shall include the following:
1. (1) A record of the time during which the FDD is in the forward-flow position;
 2. (2) The cut-in and cut-out milk or milk product temperatures, recorded daily by the operator, at the beginning of the run (HTST only), and initialed quarterly by the Regulatory Agency, or in the case of milk plants regulated under the NCIMS HACCP Program, a qualified industry person acceptable to the Regulatory Agency; and
 3. (3) Number (6) from above shall also be recorded immediately after a chart has been changed.

NOTE: The temperature shown on the recording thermometer chart shall be used to determine that the required temperature for milk or milk products containing higher fat and/or sweeteners has been achieved.

- c. Continuous-Flow Pasteurizers or Aseptic Processing Equipment with Magnetic Flow Meter Based Timing Systems: Flow rate recording charts shall be capable of continuously recording flow at the flow alarm set point and at least 19 liters (5 gallons) per minute higher than the high flow alarm setting. Flow rate recording charts shall

contain all the information specified in Subitem a. above, except (3), (4), (5), (6), and (7),

1. (1) A continuous record of the status of the high and low-flow/loss of signal alarms; and
 2. (2) A continuous record of the flow rate.
- d. Aseptic Processing Systems: Recording thermometer charts shall contain all the information specified in Subitem a. above, except (4), (5) and reference to the airspace thermometer in item (7). In addition these records shall include Subitem c. above, if applicable, and the following:
1. (1) A continuous record of the time during which the FDD, valve or system is in the forward-flow position;
 2. (2) A continuous record of applicable regenerator pressures;
 3. (3) Not later than one (1) working day after the actual process, and before shipment or release for distribution, a representative of the milk plant management, who is qualified by suitable training or experience, shall review all processing and production records for completeness and to ensure that the milk or milk product received the schedule process. The records, including the recording thermometer chart(s), shall be signed or initialed and dated by the reviewer; and
 4. (4) Number (6) from above shall also be recorded immediately after a chart has been changed.

2. EQUIPMENT TESTS AND EXAMINATIONS:

The Regulatory Agency shall perform the indicated tests on the following instruments and devices initially on installation; and at least once each three (3) months, including the remaining days of the month in which the equipment tests are due; and whenever any alteration or replacement is made which may affect the proper operation of the instrument or device. Provided, that the holding time test shall be conducted at least every six (6) months, including the remaining days of the month in which the equipment check is due.

On an emergency basis, pasteurization equipment may be tested and temporarily sealed by a milk plant employee provided the following conditions are met:

- a. The individual applying the seal(s) is employed by the milk plant in which the seal was removed;
- b. The individual has satisfactorily completed training, acceptable to the Regulatory Agency, on test controls for pasteurization equipment;
- c. The individual has demonstrated the ability to satisfactorily conduct all pasteurization control tests, in the presence of a regulatory official, within the past year;
- d. The individual is in possession of authorization from the Regulatory Agency to perform these tests;
- e. The individual will immediately notify the Regulatory Agency of the time of the shutdown that would necessitate the removal of the regulatory seal(s). Permission to test and seal the equipment must be obtained for each specific incident. The individual will also notify the Regulatory Agency of the identity of the controls affected, the

cause, if known, of the equipment failure, the repairs made and the results of testing. The individual will provide the identity and volume of milk and milk products processed during the period that temporary seals were applied to the Regulatory Agency;

- f. If regulatory tests reveal that equipment or controls are not in compliance with the provisions of this Ordinance, all milk and milk products that were processed during that period may be recalled;
- g. The Regulatory Agency or a properly trained regulatory official, commissioned by the responsible State, of each participating non-U.S. country or political subdivision thereof, will remove the temporary seal(s), retest the equipment and apply the regulatory seal(s) within ten (10) working days of notification by industry; and
- h. No Grade "A" milk or milk products will be processed after ten (10) working days without the affected equipment being tested and sealed by the Regulatory Agency or a properly trained regulatory official, commissioned by the responsible State, of each participating non-U.S. country or political subdivision thereof.

In the case of milk plants with HACCP Plans regulated under the NCIMS HACCP Program, pasteurization and aseptic processing equipment may be tested and sealed by industry personnel acceptable to the Regulatory Agency, if the following conditions are met:

- i. Test results for Pasteurization and Aseptic Processing Equipment Testing shall be recorded on a similar document for all milk plants. (Refer to the reference in Appendix M. for an example.)
- j. Industry personnel conducting the Pasteurization and Aseptic Processing Equipment Testing must be adequately trained and must be able to demonstrate an acceptable understanding and ability to conduct these tests to the Regulatory Agency.
 - 1. (1) Industry must physically demonstrate to the Regulatory Agency that they understand and can perform the required equipment tests according to the requirements of this Ordinance.
 - 2. (2) The Regulatory Agency shall accept a field practical exercise, a written exam, formal classroom training, on-the-job training or any combination of these except that, if industry personnel do not physically demonstrate the appropriate capability to perform the tests to the satisfaction of the Regulatory Agency, they are not acceptable for conducting such tests.
 - 3. (3) Continued training such as, but not limited to, on-the-job training with supervision or an acceptable pasteurizer training course should be completed before they reapply for pasteurizer equipment testing approval.
- k. Pasteurization and Aseptic Processing Equipment Tests shall be conducted at a frequency not less than the requirements of this Ordinance. Industry shall have responsibility for the performance of all required tests. At least each six (6) months the Regulatory Agency shall physically supervise these tests. Regulatory supervised tests shall include the semi-annual HTST and HHST tests. These six (6) month tests should be performed at a time that is mutually convenient to all parties. Because these tests are required to support a CCP, the industry is responsible for conducting these tests even in the absence of the regulatory official.

- l. Upon initial installation or extensive modification of any pasteurization and aseptic processing equipment, tests shall be physically supervised or conducted by the Regulatory Agency.
- m. Sealing guidance for pasteurization equipment by industry is as follows:
 1. (1) All equipment that is required to be sealed within this Ordinance shall also be sealed under the HACCP System. The sealing shall be done by a trained, qualified individual who is acceptable to the milk plant and the Regulatory Agency; and
 2. (2) The Regulatory Agency may verify any equipment sealing and evaluate (accept or reject) the skills and knowledge of the individual performing the sealing.
- n. During an audit, the auditor may conduct any or all of the Pasteurization or Aseptic Processing Equipment Tests. The auditor should, through a combination of physical examination of the equipment and a records review, satisfy themselves that the equipment is properly installed and operated.

Table 4. Equipment Tests - Batch, HTST, HHST and Aseptic Processing Systems (Refer to Appendix I.)

1.	Vat, HTST, HHST, Aseptic indicating and airspace thermometers	Temperature accuracy
2.	Vat, HTST, HHST, Aseptic recording thermometer	Temperature accuracy
3.	Vat, HTST, HHST, Aseptic recording thermometer	Time accuracy
4.	Vat, HTST, HHST, Aseptic indicating and recording thermometer	Recording vs. Indicating thermometer
5.1	HTST, HHST FDD	Leakage pass FDD
5.2	HTST, HHST FDD	FDD freedom of movement
5.3	HTST, HHST FDD	Device assembly (single stem)
5.4	HTST, HHST FDD	Device assembly (dual stem)
5.5	HTST FDD	Manual diversion
5.6	HTST, HHST FDD	Response time
5.7	HTST, HHST FDD	Time delay (inspect)
5.8	HTST, HHST FDD	Time delay (CIP)
5.9	HTST FDD	Time delay (leak-detect flush)
6.	Vat leak-protector valve(s)	Leakage
7.	HTST indicating thermometers	Response time
8.	HTST recording thermometers	Response time

9.1	HTST pressure switches	Regenerator pressures
9.2.1	HTST, HHST, Aseptic differential pressure controllers	Calibration
9.2.2	HTST differential pressure controllers	Regenerator pressure
9.2.3	HHST and Aseptic differential pressure controllers	Regenerator pressure
9.3.1	HTST booster pump/FDD	Inter-wiring check
9.3.2	HTST booster pump/metering pump	Inter-wiring check
10.1	HTST FDD	Temperature cut-in/cut-out
10.2	HHST FDD, Aseptic divert system (indirect heat)	Temperature cut-in/cut-out
10.3	HHST FDD, Aseptic divert system (direct heat)	Temperature cut-in/cut-out
11.1	HTST holding tubes/timing pumps (except magnetic flow meter based timing systems)	Holding time
11.2.a	HTST holding tubes/magnetic flow meter based timing systems	Holding time
11.2.b	HTST, HHST Aseptic magnetic flow meter based timing systems	Flow alarm
11.2.c	HTST, HHST, Aseptic magnetic flow meter based timing systems	Loss of signal/low flow
11.2.d	HTST magnetic flow meter based timing systems	Flow rate cut-in/cut-out
11.2.e	HTST magnetic flow meter based timing systems	Time delay
11.3	HHST holding tubes indirect heat	Holding time
11.4	HHST holding tubes direct injection heat	Holding time
11.5	HHST holding tubes direct infusion heat	Holding time
12.1	HHST, Aseptic systems indirect heating	Sequence logic
12.2	HHST, Aseptic systems direct heating	Sequence logic
13.	HHST, Aseptic systems	Pressure in the holding tube
14.	HHST, Aseptic systems using direct injection heating	Pressure differential across injector
15.	Vat, HTST HHST Aseptic (all electronic controls)	Electro-Magnetic Interference

ITEM 17p. COOLING OF MILK AND MILK PRODUCTS

All raw milk and milk products shall be maintained at 7°C (45°F) or less until processed. All whey and whey products for condensing shall be maintained at a temperature of 7°C (45°F) or less; or 63°C (145°F) or greater until processed, except that acid-type whey with a titratable acidity of 0.40% or above, or a pH of 4.6 or below, is exempted from these temperature requirements.

All pasteurized milk and milk products, except those to be cultured, shall be cooled immediately prior to filling or packaging, in approved equipment, to a temperature of 7°C (45°F) or less, unless drying is commenced immediately after condensing. All condensed whey and whey products shall be cooled during the crystallization process to 7°C (45°F) or less within 48 hours of condensing, including the filling and emptying time, unless filling occurs above 57°C (135°F), in which case, the 48 hour time period begins when cooling is started.

All pasteurized milk and milk products shall be stored at a temperature of 7°C (45°F) or less and maintained thereat until further processed.

Every refrigerated room or tank in which milk or milk products, whey and whey products, and condensed milk and milk products are stored, shall be equipped with an accurate indicating thermometer.

On delivery vehicles, the temperature of milk and milk products shall not exceed 7°C (45°F).

Aseptically processed milk and milk products to be packaged in hermetically sealed containers shall be exempt from the cooling requirements of this Item.

PUBLIC HEALTH REASON

When milk and milk products are not cooled within a reasonable time, after being received at the milk plant, its bacterial content will be materially increased. The same reasoning applies to cooling the milk and milk products after pasteurization, unless drying is commenced immediately after condensing.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All raw milk and milk products are maintained at 7°C (45°F) or less until processed, except that acid-type whey with a titratable acidity of 0.40% or above, or a pH of 4.6 or below, is exempt from these temperature requirements.
2. All whey and whey products for condensing are maintained at a temperature of 7°C (45°F) or less; or 63°C (145°F) or greater until processed, unless surge tanks are used and emptied, cleaned and sanitized after each 4 hours of use or less.
3. All pasteurized milk and milk products, except those to be cultured, are cooled immediately in approved equipment prior to filling or packaging to a temperature of 7°C (45°F) or less, unless drying is commenced immediately after condensing.
4. All pasteurized milk and milk products shall be stored at a temperature of 7°C (45°F) or less and be maintained thereat until further processed. If surge tanks or balance tanks are used between the evaporator and the drier, such tanks shall hold the product at a temperature of 66°C (150°F) or more, or shall be completely emptied and cleaned after each 4 hours of operation or less.

5. All condensed whey and whey products are cooled during the crystallization process to 7°C (45°F) or less, within 48 hours of condensing including the filling and emptying time, unless filling occurs above 57°C (135°F), in which case, the 48 hour time period begins when cooling is started.
6. Each refrigerated room in which milk and milk products are stored, except aseptically processed milk and milk products, is equipped with an indicating thermometer that complies with the applicable specifications of Appendix H. Such thermometer shall be located in the warmest zone of the refrigerated room.
7. Each storage tank shall be equipped with an indicating thermometer, the sensor of which shall be located to permit the registering of the temperature of the contents when the tank contains no more than twenty percent (20%) of its calibrated capacity. Such thermometer shall comply with the applicable specifications of Appendix H.
8. On delivery vehicles, the temperature of milk and milk products shall not exceed 7°C (45°F).
9. All surface coolers comply with the following specifications:
 - a. The sections of open-surface coolers shall be so installed as to leave a gap of at least 6.4 millimeters (0.25 inches) between the header sections to permit easy cleaning.
 - b. Where header ends are not completely enclosed within the cooler covers, condensation or leakage from the headers shall be prevented from entering the milk or milk product by so shaping the exposed header faces, above and below all gaps, that condensation is directed away from the tubes, and by using deflectors at the bottom of the headers; or by shortening the bottom of the headers; or by shortening the bottom trough; or by some other approved method.
 - c. The location of supports of cooler sections shall prevent condensation and leakage from entering the milk or milk product.
 - d. All open-surface coolers shall be provided with tight-fitting shields that protect the milk and milk product from contamination by insects, dust, drip, splash or manual contact.
10. Recirculated cooling water, which is used in coolers and heat exchangers, including those systems in which a freezing point depressant is used, is from a safe source and protected from contamination. Such water shall be tested semiannually and shall comply with the Bacteriological Standards of Appendix G. Samples shall be taken by the Regulatory Agency and examination shall be conducted in an Official Laboratory. Recirculated cooling water systems, which become contaminated through repair work or otherwise, shall be properly treated and tested before being returned to use. Freezing point depressants and other chemical additives, when used in recirculating systems, shall be non-toxic under conditions of use. Recirculated cooling water contained in corrosion resistant, continuous piping, with no joints or welds, which fail to meet applicable ASME or equivalent standards in the non-potable water contact areas, may be considered to be protected from contamination, as required above, when cooled by non-potable water flowing over the exterior of the piping, within open evaporative type cooling tower. In these systems, the recirculated cooling water piping shall be properly maintained and shall be installed so that it is at least two (2) pipe diameters above the flood rim of the cooling tower.

ITEM 18p. BOTTLING, PACKAGING AND CONTAINER FILLING

Bottling, packaging and container filling of milk and milk products shall be done at the place of pasteurization in a sanitary manner by approved mechanical equipment.¹⁰

For milk plants that dry milk products, these dry milk products shall be packaged in new containers, which protect the contents from contamination, and after packaging, shall be stored in a sanitary manner.

For milk plants that condense and/or dry milk or milk products, these condensed and dry milk products may be transported in sealed containers in a sanitary manner from one (1) milk plant to another for further processing and/or packaging.

Condensed and dry milk product packaging containers shall be stored in a sanitary manner.

PUBLIC HEALTH REASON

Manual bottling, packaging and container filling is very apt to result in the exposure of the milk and milk products to contamination, which would nullify the effect of pasteurization. The transfer of milk and milk products from the place of pasteurization to another milk plant for bottling, packaging or container filling may subject the pasteurized milk or milk product to unnecessary risks of contamination. Reuse of packages for dry milk products is likely to result in contamination of the dry milk products.

ADMINISTRATIVE PROCEDURES¹¹

This Item is deemed to be satisfied when:

1. All milk and milk products, including concentrated (condensed) milk and milk products, are bottled and packaged at the milk plant where final pasteurization is performed. Such bottling and packaging shall be done without undue delay following final pasteurization.
2. All bottling or packaging is done on approved mechanical equipment. The term "approved mechanical equipment" shall not be interpreted to exclude manually operated machinery, but is interpreted to exclude methods in which the bottling and capping devices are not integral within the same system.
3. All pipes, connections, defoaming devices and similar appurtenances shall comply with Items 10p and 11p of this Section. Milk and milk products from continuous defoamers are not returned directly to the filler bowl.
4. Bottling or packaging machine supply tanks and bowls are equipped with covers that are constructed to prevent any contamination from reaching the inside of the filler tank or bowl. All covers shall be in place during operation.
5. A drip deflector is installed on each filler valve. Drip deflectors shall be designed and adjusted to divert condensation away from the open container.
6. Container in-feed conveyors to automatic bottling or packaging machines have overhead shields to protect the bottles or packages from contamination. These shields shall extend from the bottle washer discharge to the bottle feed-star, or in the case of single-service packaging machines, from the forming unit discharge to the filling unit and from the filling unit to the closure unit. Overhead shields shall be required on can in-feed conveyors when the cans are fed to the filler with the covers off.

7. Container coding/dating devices are designed, installed and operated such that the coding/dating operations are performed in a manner that open containers are not subjected to contamination. Shielding shall be properly designed and installed to preclude the contamination of open containers.
8. Container fabricating materials, such as paper stock, foil, wax, plastic, etc., are handled in a sanitary manner and protected against undue exposure during the package assembly operation.
9. Bottling and packaging machine floats are designed to be adjustable without removing the cover.
10. The filler pipe of all bottling and packaging machines have a diversion apron or other acceptable device, as close to the filler bowl as possible, to prevent condensation from entering the inside of the filler bowl.
11. Filling cylinders on packaging machines are protected from contamination by overhead shields. When lubricants are used on filler pistons, cylinders or other milk or milk product-contact surfaces, the lubricant shall be food-grade and applied in a sanitary manner.
12. In the case of aseptic processing systems, the milk and milk product shall be aseptically filled into sterilized containers and hermetically sealed in conformance with the applicable requirements of 21 CFR 113.

For milk plants that condense and/or dry milk or milk products, the following shall apply:

1. The filling of condensed and dry milk product containers is done by mechanical equipment. The term "mechanical equipment" shall not be interpreted to exclude manually operated equipment.
2. All pipes, connections and similar appurtenances comply with Items 10p and 11p.
3. Filling devices are constructed so as to prevent any contamination from reaching the product. Covers of filling devices, if used, shall be in place during operation.
4. Packaged dry milk and milk products are stored and arranged so as to be easily accessible for inspection and to permit cleaning of the storage room.
5. All condensed and dry milk product containers are filled in a sanitary manner by methods which:
 - a. Protect the product from airborne contamination;
 - b. Prevent manual contact with condensed and dry milk product-contact surfaces; and
 - c. Minimize manual contact with the product.
6. All final containers for dry milk products shall be new and of the single-service type and sufficiently substantial to protect the contents from impairment of quality with respect to sanitation, contamination and moisture, under customary conditions of handling, transportation, and storage.
7. If portable storage bins are used, they comply with the applicable provisions of Items 10p and 11p.
8. Containers are closed immediately after being filled.

ITEM 19p. CAPPING, CONTAINER CLOSURE AND SEALING AND DRY MILK PRODUCT STORAGE

Capping, closing or sealing of milk and milk product containers shall be done in a sanitary manner by approved mechanical capping, closing and/or sealing equipment. The cap or closure shall be designed and applied in such a manner that the pouring lip is protected to at least its largest diameter and, with regard to fluid product containers, removal cannot be made without detection.

PUBLIC HEALTH REASON

Improper closing or sealing and hand capping exposes the milk or milk product to contamination. A cover extending over the pouring lip of the container protects it from contamination during subsequent handling, and prevents the sucking back into the bottle, by temperature contraction, of any contaminated liquid on the cap, including milk or milk product that has been forced out by temperature expansion and may have become contaminated. Caps or closures that are applied in such a manner that they cannot be removed without detection help to assure the consumer that the milk and milk products have not been contaminated after packaging.

ADMINISTRATIVE PROCEDURES¹²

This Item is deemed to be satisfied when:

1. The capping, closing or sealing of milk and milk product containers is done in a sanitary manner on approved mechanical capping, closing and/or sealing equipment. The term "approved mechanical capping, closing and/or sealing equipment" shall not exclude manually operated machinery. Hand capping shall be prohibited. Provided, that if suitable mechanical equipment, for the capping or closing of container(s) of 12.8 liters (3 gallons) or more is not available, other methods which eliminate all possibility of contamination may be approved by the Regulatory Agency.
2. All mechanical capping, closing or sealing mechanisms are designed to minimize the need for adjustment during operation.
3. Bottles and packages that have been imperfectly capped or closed are emptied immediately into approved sanitary containers. Such milk or milk products shall be protected from contamination, maintained at 7°C (45°F) or less, except dry milk products, and subsequently repasteurized or discarded.
4. All caps and closures are designed and applied in such a manner that the pouring lip is protected to at least its largest diameter and, with respect to fluid milk and milk product containers, removal cannot be made without detection. Single-service containers are so constructed that the product and the pouring and opening areas are protected from contamination during handling, storage and when the containers are initially opened.
5. All caps and closures are handled in a sanitary manner. The first cap from each tube, the first lap(s) from each roll of cap or cover stock and the first sheet of parchment or cover paper shall be discarded. The subsequent use of loose caps that are left in the cappers at the end of an operating period, after removal from the cap tubes, shall be a violation of this Item, provided, that loose plastic caps and closures supplied by the manufacturer in plastic bags may be returned to storage in a protective wrap if removed from a hopper/descrambler immediately after a production run. Plastic caps and closures remaining in the chute between the hopper and the capping device shall be discarded.
6. All dry milk products are stored in a sanitary manner.

ITEM 20p. PERSONNEL - CLEANLINESS

Hands shall be thoroughly washed before commencing milk plant functions and as often as may be required to remove soil and contamination. No employee shall resume work after visiting the toilet room without thoroughly washing their hands. All persons, while engaged in the handling, processing, pasteurization, storage, transportation, or packaging of milk or milk products, containers, utensils and equipment shall wear clean outer garments. All persons, while engaged in the processing of milk or milk products, shall wear adequate hair coverings and shall not use tobacco.

PUBLIC HEALTH REASON

Clean clothing and clean hands, including clean fingernails, reduce the possibility of milk or milk products, containers, utensils and equipment becoming contaminated.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. Hands are thoroughly washed before commencing milk plant functions and as often as may be required to remove soil and contamination.
2. Each employee washes their hands following a visit to the toilet room and prior to resuming work.
3. All persons while engaged in the handling, processing, pasteurization, storage, transportation, or packaging of milk or milk products containers, utensils, and equipment wear clean outer garments.
4. The use of tobacco products is prohibited in all rooms in which milk and milk products are handled, processed or stored, or in which milk or milk product containers, utensils and/or equipment are washed. These rooms shall include, but are not limited to, the receiving, processing, packaging, milk and milk product storage, cooling and dry storage ingredients, single-service article storage and container/utensil wash-up areas. Any person engaged in the processing of milk or milk products wears adequate hair coverings.
5. Specially provided clean rubbers or boot covers, clean coveralls, and white cap, clean cloth or paper, are worn whenever it is necessary to enter the drying chambers. Such articles of clothing are stored in such a manner as to be protected from contamination. Boot covers, which have come into contact with areas other than those within the dryer, are not considered clean.

ITEM 21p. VEHICLES

All vehicles used for the transportation of pasteurized milk and milk products shall be constructed and operated so that the milk and milk products are maintained at 7°C (45°F) or less and are protected from contamination. Milk tank cars, milk tank trucks, and portable shipping bins shall not be used to transport or contain any substances that may be toxic or harmful to humans.

PUBLIC HEALTH REASON

Milk and milk products, as well as empty containers, should be protected against contamination at all times.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. All vehicles are kept clean.
2. Material that is capable of contaminating milk or milk products is not transported with milk or milk products.
3. Milk and milk products, except dry milk products, are maintained at 7°C (45°F) or less.
4. The operation of milk tank cars and shipping bins comply with the following provisions:
 - a. Milk and milk products shall be conducted to and from tank cars or shipping bins only through sanitary conveying equipment. Such equipment shall be capped or otherwise protected when not in use.
 - b. Inlets and outlets of shipping bins shall be provided with tight-fitting dust caps or covers.
 - c. Facilities shall be provided for the adequate washing and sanitizing of shipping bins, piping, and accessories at all milk plants receiving or shipping milk or milk products in shipping bins.
 - d. Shipping bins shall be cleaned at the receiving milk plant immediately after being emptied. The clean shipping bins shall be sanitized at the shipping milk plant before loading. Milk tank trucks, which must make more than one trip while unloading a tank car, need not be cleaned and sanitized after each time they are emptied.
 - e. Piping connections and pumps used with shipping bins shall be cleaned and sanitized after each use.
5. The doors of tank cars and covers of shipping bins are sealed with a metal seal immediately after loading. The seal shall remain unbroken until the contents are delivered to the consignee. Contents of the tank car or shipping bin shall be labeled as prescribed in Section 4 by means of a tag attached to the tank car or shipping bin.
6. Vehicles have fully enclosed bodies with well-fitted, solid doors.

ITEM 22p. SURROUNDINGS

Milk plant surroundings shall be kept neat, clean and free from conditions which might attract or harbor flies, other insects and rodents or which otherwise constitute a nuisance.

PUBLIC HEALTH REASON

The surroundings of a milk plant should be kept neat and clean to prevent attracting rodents, flies and other insects, which may contaminate the milk or milk products. Insecticides and rodenticides, not

approved for use in milk plants, or approved insecticides and rodenticides, not used in accordance with label recommendations, may contaminate the milk or milk products processed by the milk plant.

ADMINISTRATIVE PROCEDURES

This Item is deemed to be satisfied when:

1. There is no accumulation of trash, garbage or similar waste in areas adjacent to the milk plant. Waste material stored in suitable covered containers shall be considered in compliance.
2. 2. Driveways, lanes and areas serving milk plant vehicular traffic are graded, drained and free from pools of standing water.
3. Outdoor areas for milk tank truck unloading are constructed of smooth concrete or equally impervious material, properly sloped to drain and equipped with trapped drains of sufficient size.
4. Only insecticides and rodenticides approved for use by the Regulatory Agency and/or registered with EPA shall be used for insect and rodent control.

SECTION 10. ANIMAL HEALTH

1. All milk for pasteurization shall be from herds in Areas which have a Modified Accredited Advanced Tuberculosis status or greater as determined by the USDA. Provided, that in an Area which fails to maintain such status, any herd shall have been accredited by said Department as tuberculosis free, or shall have passed an annual tuberculosis test, or the Area shall have established a tuberculosis testing protocol for livestock that assures tuberculosis protection and surveillance of the dairy industry within the Area and that it is approved by FDA, USDA and the Regulatory Agency.
2. All milk for pasteurization shall be from herds under a brucellosis eradication program, which meets one (1) of the following conditions:
 - a. Located in a Certified Brucellosis-Free Area as defined by USDA and enrolled in the testing program for such areas; or
 - b. Meet USDA requirements for an individually certified herd; or
 - c. Participating in a milk ring testing program at least two (2) times per year at approximately one hundred eighty (180) day intervals and all herds with positive milk ring results shall have the entire herd blood tested within thirty (30) days from the date of the laboratory ring tests; or
 - d. Have an individual blood agglutination test annually with an allowable maximum grace period not exceeding two (2) months.
3. Goat, sheep, water buffalo, or any other hooved mammal milk for pasteurization, ultra-pasteurization or aseptic processing, defined under this Ordinance, shall be from a herd or flock that:
 - a. Has passed an annual whole herd or flock brucellosis test as recommended by the State Veterinarian or USDA Area Veterinarian in Charge (AVIC); or
 - b. Has passed an initial whole herd brucellosis test, followed only by testing replacement animals or any animals entering the milking group or sold as dairy animals; or
 - c. Has passed an annual random blood-testing program sufficient to provide a confidence level of 99% with a P value of 0.05. Any herd or flock with one (1) or more confirmed positive animals shall go to 100% testing until the whole herd tests show no positive animals are found; or
 - d. Has passed a USDA approved bulk milk test, at USDA recommended frequency, with an implementation date based on availability of the test.

(Refer to the [last NOTE: in Section 6.](#))

The following table¹³ will provide the random sampling size needed to achieve 99% confidence with a P value of 0.05:

Herd/Flock Size	Sampling Size	Herd/Flock Size	Sampling Size
20	20	500	82
50	41	600	83
100	59	700	84
150	67	800	85
200	72	1000	86
250	75	1400	87
300	77	1800	88
350	79	4000	89
400	80	10000	89
450	81	100000	90

4. For diseases other than brucellosis and tuberculosis, the Regulatory Agency shall require such physical, chemical or bacteriological tests, as it deems necessary. The diagnosis of other diseases in dairy animals shall be based upon the findings of a licensed and accredited¹⁴ veterinarian or an accredited veterinarian in the employ of an official Agency. Any diseased animal disclosed by such test(s) shall be disposed of as the Regulatory Agency directs.
5. Records supporting the tests required in this Section shall be available to the Regulatory Agency and be validated with the signature of a licensed and accredited veterinarian or an accredited veterinarian in the employ of an official Agency.

PUBLIC HEALTH REASON

The health of the animal is a very important consideration, because a number of diseases of cattle, including tuberculosis, brucellosis, Q-fever, salmonellosis, staphylococcal infection and streptococci infection, may be transmitted to man through the medium of milk. The organisms of most of these diseases may get into the milk either directly from the udder, or indirectly through infected body discharges which may drop, splash or be blown into the milk.

The great reduction in the incidence of bovine tuberculosis in man indicates that the practice of good sanitation in animal husbandry, the testing of dairy animals and removal of the reactors from the herds, and the pasteurization of milk, have been effective in the control of this disease. The reservoir of bovine tuberculosis still exists; however, constant vigilance against this disease must be continued by industry and Regulatory Agencies.

ADMINISTRATIVE PROCEDURES

BOVINE TUBERCULOSIS: All tuberculin tests and retests shall be made, and any reactors disposed of, in accordance with the current edition of Uniform Methods and Rules; Bovine Tuberculosis Eradication, Uniform Methods and Rules for Establishment and Maintenance of Tuberculosis-Free Accredited Herds of Cattle, Modified Accredited Areas and Areas Accredited Free of Bovine Tuberculosis in the Domestic Bovine, as published by USDA. For tuberculosis test purposes, the herd

is defined as all adult cattle twenty-four (24) months of age and over, including any commingled beef animals. Dairy cattle less than two (2) years of age and already milking shall be included in the herd test. A letter or other official correspondence attesting to the accreditation status of the locality in which the herd is located, including the date of accreditation, or a certificate identifying the animals tested, the date of injection, the date of reading of the test and the results of the test signed by a USDA accredited veterinarian, shall be evidence of compliance with the above requirements and shall be filed with the Regulatory Agency. (Refer to Appendix A.)

BOVINE BRUCELLOSIS: All brucellosis tests, retests, disposal of reactors, vaccination of calves and certification of herds and areas shall be in accordance with the current edition of Brucellosis Eradication, Recommended Uniform Methods and Rules, as published by USDA. All reactors disclosed on blood agglutination tests shall be separated immediately from the milking herd and the milk of these reactors shall not be used for human consumption.

A certificate identifying each animal, signed by the veterinarian and the director of the laboratory making the test, shall be filed as directed by the Regulatory Agency. Provided, that in the event the herd is subject to the milk ring test, the record shall be required to show only the date and results of such test. Within thirty (30) days following the expiration of an official milk ring testing program, or in the case of a herd subject to annual blood tests, thirteen (13) months following the last annual blood tests, the Regulatory Agency shall notify the herd owner or operator of the necessity to comply with the brucellosis requirements. The failure of the herd owner or operator to comply with the brucellosis requirements within thirty (30) days of written notice shall result in immediate suspension of the permit. (Refer to Appendix A.)

SECTION 11. MILK AND MILK PRODUCTS WHICH MAY BE SOLD

From and after twelve (12) months from the date on which this Ordinance is adopted, only Grade "A" pasteurized, ultra-pasteurized, or aseptically processed milk and milk products shall be sold to the final consumer, to restaurants, soda fountains, grocery stores or similar establishments. Provided, only Grade "A" milk and milk products shall be sold to milk plants for use in the commercial preparation of Grade "A" milk and milk products. Provided further, that in an emergency, the sale of pasteurized milk and milk products, which have not been graded, or the grade of which is unknown, may be authorized by the Regulatory Agency, in which case, such milk and milk products shall be labeled "ungraded".

SECTION 12. TRANSFERRING; DELIVERY CONTAINERS; AND COOLING

Except as permitted in this Section, no milk producer, bulk milk hauler/sampler or distributor shall transfer milk or milk products from one (1) container or milk tank truck to another on the street, in any vehicle, store or in any place except a milk plant, receiving station, transfer station or milk house especially used for that purpose. The dipping or ladling of milk or fluid milk products is prohibited.

It shall be unlawful to sell or offer for sale any pasteurized milk or milk products that have not been maintained at the temperature set forth in Section 7 of this Ordinance. If containers of pasteurized milk or milk products are stored in ice, the storage container shall be properly drained.

ADMINISTRATIVE PROCEDURES

TRANSFERRING: The dipping or ladling of milk and fluid milk products is expressly prohibited, except for immediate cooking purposes. Milk and milk product containers, which have been filled and sealed at a milk plant, shall be used for the delivery of milk or milk products. Caps, closures or labels shall not be removed or replaced during transportation.

BULK DISPENSERS: Bulk dispensers, approved by the Regulatory Agency, shall satisfy the following sanitary design, construction and operation requirements:

1. All dispensers shall comply with the applicable requirements of Section 7 of this Ordinance.
2. Product-contact surfaces shall be inaccessible to manual contact, droplet infection, dust or insects, but the delivery orifice may be exempted from this requirement.
3. All parts of the dispensing device with which milk or milk products come into contact, including any measuring device, shall be thoroughly cleaned and sanitized at the milk plant. Provided, that dispensing valves, which are applied to the dispenser subsequent to its delivery to the retail vendor may be cleaned and sanitized at such establishments.
4. The dispensing container shall be filled at the milk plant and shall be sealed so that it is impossible to withdraw any part of its contents, or to introduce any substance without breaking the seal(s).
5. The milk or milk products shall be thoroughly and automatically mixed with each dispensing operation, except for milk or milk products that remain homogeneous.
6. All cans shall be thoroughly cleaned and sanitized. Milk and milk products shall be kept at or below 7°C (45°F) at all times. The dispenser tube shall be integral with the dispensing container, shall be protected and shall be under adequate refrigeration during transportation and storage.

SECTION 13. MILK AND MILK PRODUCTS FROM POINTS BEYOND THE LIMITS OF ROUTINE INSPECTION

Milk and milk products, from points beyond the limits of routine inspection of the ... of... or its jurisdiction, shall be sold in...,¹ or its jurisdiction provided they are produced and pasteurized, ultra-pasteurized, aseptically processed, concentrated (condensed) or dried under regulations which are substantially equivalent to this Ordinance and have been awarded acceptable Milk Sanitation Compliance and Enforcement Ratings or have been awarded a satisfactory HACCP listing, under the NCIMS HACCP Program as specified in Appendix K. of this Ordinance.

ADMINISTRATIVE PROCEDURES

The Regulatory Agency should accept, without their actual physical inspection, supplies of milk and milk products from an area or an individual shipper not under their routine inspection. Provided, that:

1. Milk and milk products upon arrival shall comply with bacteriological, physical, chemical and temperature standards of Section 7. Provided, that direct shipped producer milk that is under the supervision of more than one (1) Regulatory Agency may be exempt from the bacteriological requirement for commingled samples. However, the receiving Regulatory Agency shall have the right to use the individual producer samples to determine compliance with the bacteriological standards.
2. After receipt, pasteurized, ultra-pasteurized, aseptically processed, concentrated (condensed) or dried milk and milk products shall comply with Sections 2, 4 and 10.

NOTE: Raw and pasteurized milk and milk products beyond the limits of routine inspection shall be sampled as the Regulatory Agency requires.

3. The milk or milk products are produced and processed under regulations substantially equivalent to those of this Ordinance.
4. The supplies are under routine official supervision;
5. The supplies have been awarded, by a Milk Sanitation Rating Officer (SRO), certified by FDA, Milk Sanitation Compliance and Enforcement Ratings equal to that of the local supply or equal to ninety percent (90%) or higher; and
6. All ratings are made on the basis of procedures outlined in the Methods of Making Sanitation Ratings of Milk Supplies (MMSR).

NOTE: Names of interstate milk shippers and their ratings, as reported by State Rating Agencies, are contained in the IMS List-Sanitation Compliance and Enforcement Ratings of Interstate Milk Shippers (IMS List), issued semi-annually by FDA. Copies of this list may be obtained from the State Milk Rating/Regulatory Agency or from the Food and Drug Administration, HFS-626, 5100 Paint Branch Parkway, College Park, MD 20740-3835.

7. The supplies have been awarded, by a SRO, certified by FDA, a satisfactory listing under the NCIMS HACCP Program as specified in Appendix K. of this Ordinance.
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SECTION 14. PLANS FOR CONSTRUCTION AND RECONSTRUCTION

Properly prepared plans for all milk houses, milking barns, stables and parlors, milk tank truck cleaning facilities, milk plants, receiving stations and transfer stations regulated under this Ordinance, which are hereafter constructed, reconstructed or extensively altered shall be submitted to the Regulatory Agency for written approval before work is begun.

SECTION 15. PERSONNEL HEALTH

No persons affected with any disease capable of being transmitted to others through the contamination of food shall work at a milk plant in any capacity which brings them into direct contact with pasteurized milk or milk products or which brings them into direct contact with associated pasteurized or aseptically processed milk or milk product-contact surfaces.

In the case of milk plants, receiving stations, or transfer stations that have HACCP Systems, which are regulated under the NCIMS HACCP Program, the HACCP System shall address the public health concerns described in this Section in a manner that provides protection equivalent to the requirements in this Section.

ADMINISTRATIVE PROCEDURES

Milk plant operators who have received reports, under this Section, from employees who have handled pasteurized milk or milk products or associated milk or milk product-contact surfaces shall immediately report these facts to the appropriate Milk Regulatory Agency.

Milk plant employees, or applicants to whom a conditional offer of employment has been made, shall be instructed by the milk plant that the employee or applicant or applicants to whom a conditional offer of employment has been made is responsible to report to the milk plant management, in a manner that allows the milk plant to prevent the likelihood of the transmission of diseases that are transmissible through foods, if the employee or applicant to whom a conditional offer of employment has been made:

1. Is diagnosed with an illness due to Hepatitis A virus, Salmonella typhi, Shigella species, Norwalk and Norwalk-like Viruses, Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli 0157:H7, enterohemorrhagic Escherichia coli, enterotoxigenic Escherichia coli, Campylobacter jejuni, Entamoeba histolytica, Giardia lamblia, Non-typhoidal Salmonella, Rotovirus, Taenia solium, Yersinia enterocolitica, Vibrio cholerae O1 or other infectious or communicable disease that has been declared by the Secretary of Health and Human Services (HHS) to be transmissible to others through the handling of food, or has been clearly shown to be so based upon verifiable epidemiological data; or
2. Is exposed to, or suspected of causing, a confirmed foodborne disease outbreak of one (1) of the diseases specified in Item 1 above, including an outbreak at an event such as a family meal, church supper or ethnic festival because the employee or applicant to whom a conditional offer of employment has been made:
 - a. Prepared food implicated in the outbreak; or
 - b. Consumed food implicated in the outbreak; or
 - c. Consumed food at the event prepared by a person who is infected or ill.
3. Lives in the same household as a person who attends or works in a day care center or school, similar institution experiencing a confirmed outbreak of one (1) of the diseases specified in Item 1 above.

Similarly, milk plant employees shall be instructed by the milk plant management to report to the milk plant management if the employee, or applicant to whom a conditional offer of employment has been made.

4. Has a symptom associated with acute gastrointestinal illness such as: Abdominal cramps or discomfort, diarrhea, fever, loss of appetite for three (3) or more days, vomiting, jaundice; or
5. Has a pustular lesion such as a boil or infected wound that is:
 - a. On the hands, wrists or exposed portions of the arms, unless the lesion is covered by a durable, moisture proof, tight-fitting barrier; or
 - b. On other parts of the body if the lesion is open or draining, unless the lesion is covered by a durable, moisture proof, tight-fitting barrier.

SECTION 16. PROCEDURE WHEN INFECTION OR HIGH RISK OF INFECTION IS DISCOVERED

When a person who may have handled pasteurized or aseptically processed milk or milk products or pasteurized or aseptically processed milk or milk product-contact surfaces meets one (1) or more of the conditions specified in the Administrative Procedures of Section 13, the Milk Regulatory Agency is authorized to require any or all of the following measures:

1. The immediate restricting of that person from duties that require handling pasteurized milk or milk products, or the handling of related milk or milk product-contact surfaces. This restriction may be lifted after an appropriate medical clearance or cessation of symptoms or both, according to the following Table:

Table 5. Removal of Restrictions when Infection or High Risk of Infection is Discovered	
Health Status	Removing Restrictions
a. Is diagnosed with an illness due to Hepatitis A virus, Salmonella typhi, Shigella species, Norwalk and Norwalk-like Viruses, Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli 0157:H7, enterohemorrhagic Escherichia coli, enterotoxigenic Escherichia coli, Campylobacter jejuni, Entamoeba histolytica, Giardia lamblia, Non-typhoidal Salmonella, Rotovirus, Taenia solium, Yersinia enterocolitica, Vibrio cholerae O1 or other infectious or communicable disease that has been declared by the Secretary of HHS to be transmissible to others through the handling of food or has been clearly shown to be so based upon verifiable epidemiological data.	Restrictions lifted by medical clearance.
b. Meeting a high-risk scenario as specified in Section 13 (2 or 3) and/or experiencing symptoms in Section 13 (4 or 5).	Restrictions lifted when symptoms cease or medical documentation is provided that infection does not exist.
c. Asymptomatic, but stools positive for Salmonella typhi, Shigella or Escherichia coli 0157:H7.	Restrictions lifted by medical clearance.
d. Past illness from Salmonella typhi, Shigella, Escherichia coli 0157:H7 or other human pathogens for which humans have been determined to be carriers.	Restrictions lifted by medical clearance.
e. In the case of diagnosed or suspected Hepatitis A, onset of jaundice within the last seven (7) days.	Restrictions lifted by medical clearance.
f. In the case of diagnosed or suspected Hepatitis A, onset of jaundice occurred more than seven (7) days ago.	Restrictions lifted by medical clearance or jaundice ceases.

- 2.

3. The immediate exclusion of the affected milk or milk products from distribution and use when medically appropriate, i.e., a medical evaluation of the sequence of events indicates that contamination of milk or milk product may have occurred.
4. The immediate requesting of medical and bacteriological examination of the person at risk.

NOTE: Persons at risk who decline to be examined may be reassigned to duties where they will not be required to handle pasteurized, ultra-pasteurized or aseptically processed milk or milk products and associated milk or milk product-contact surfaces.

In the case of milk plants, receiving stations, or transfer stations that have HACCP Systems, which are regulated under the NCIMS HACCP Program, the HACCP System shall address the public health concerns described in this Section in a manner that provides protection equivalent to the requirements in this Section.

SECTION 17. ENFORCEMENT

This Ordinance shall be enforced by the Regulatory Agency in accordance with the Grade "A" PMO, with Administrative Procedures, current edition. A certified copy¹⁵ of which shall be on file at the appropriate Regulatory Agency's office. Where the mandatory compliance with provisions of the Appendixes is specified, such provisions shall be deemed a requirement of this Ordinance.

SECTION 18. PENALTY

Any person who shall violate any of the provisions of this Ordinance shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than \$... and/or such persons may be enjoined from continuing such violation(s). Each day upon which such a violation(s) occurs shall constitute a separate violation.

SECTION 19. REPEAL AND DATE OF EFFECT

All ordinances and parts of ordinances in conflict with this Ordinance shall be repealed twelve (12) months after the adoption of this Ordinance, at which time this Ordinance shall be in full force and effect, as provided by law.

SECTION 20. SEPARABILITY CLAUSE

Should any Section, paragraph, sentence, clause or phrase of this Ordinance be declared unconstitutional or invalid for any reason, the remainder of this Ordinance shall not be affected thereby.

SECTION 21: APPENDIX J

Appendix J. Standards for the Fabrication of Single-Service Containers and Closures for Milk and Milk Products

Single-service containers and closures have been used in the dairy industry for many years. Industry applied quality assurance controls for manufacturing and handling of the materials have made it possible for these products to reach the point of use in a sanitary condition free from toxic materials, which may migrate into milk or milk products.

Within recent years, single-service container manufacturers have introduced new materials, equipment, and design concepts for these containers and closures. Evaluation of the industry's basic manufacturing and handling techniques and establishment of sanitation criteria assure that single-service containers and closures and the materials from which they are formed are safe and in compliance with bacteriological standards of Item 12p of this Ordinance.

STANDARDS FOR THE FABRICATION OF SINGLE-SERVICE CONTAINERS AND CLOSURES FOR MILK AND MILK PRODUCTS

A. PURPOSE AND SCOPE

The use of these Standards will ensure the production of sanitary containers and closures for milk and milk products, as defined in this Ordinance.

These Standards shall apply to all blank fabricators, pre-form bottle manufacturers, converters, printers, closure manufacturers, plastic laminators, sheet formers, blow molders, vacuum formers, plastic extruders, injection molders, pre-formers, manufacturers of valves, tubes, dispensing devices, sample containers and any other similar plants. These also apply to fabricating plants producing a component part(s), including fabricators of film and/or closures, which may become a product-contact surface and plants assembling components into a final assembled product. These requirements shall not apply to paper mills or resin manufacturing plants.

Milk and food plants manufacturing and/or selling containers to other milk plants, as defined in this Ordinance, excluding milk plants that condense and/or dry milk or milk products, shall meet all the requirements of these Standards.

Grade "A" milk plants, as defined in this Ordinance, excluding milk plants that condense and/or dry milk or milk products, shall use single-service containers and closures from plants certified in the latest semi-annual publication of the IMS List.

These Standards provide certain criteria for the listing of certified single-service manufacturers in the current publication of the IMS List. (Refer to Section E.)

B. DEFINITIONS

The following definitions shall be employed in the application of these sanitation Standards:

1. "Broke and Trim" shall mean paper and paperboard that have been discarded anywhere in the process of manufacture, such as on paper-making machines in the form of trim. This may also include unprinted trim from the converting process, provided the trim has been handled, treated and transported in a clean, sanitary manner.
2. "Closure" shall mean a cap, lid, seal, tube, valve, lid material or other device in or on a container used for the purpose of enclosing or dispensing the contents.
3. "Coatings" shall mean any layer or covering which is applied to the product-contact surface
4. "Component Part" shall mean any item that by itself, does not perform any function, but when assembled with one (1) or more component parts or closures, becomes a part of the single-service container or closure. These may include, but are not limited to blanks, sheeting, valves and valve parts, tubes, dispensing devices and sampling containers. All material used for fabrication of a component part must meet the requirements of the FFD&CA as amended.
5. "Manufacturer" shall mean any person or company in the business of manufacturing a single-service container or closure for the packaging or sampling of a Grade "A" milk or milk product.
6. "Manufacturing Line" shall mean a manufacturing process such as injection molding, extrusion, blow-molding, etc.
7. "Metals" shall mean those metals that are non-toxic, nonabsorbent and corrosion-resistant under conditions of intended use.
8. "Non-toxic Materials" shall mean materials that are free of substances, which may render the product injurious to health or which may adversely affect the flavor, odor, composition or bacteriological quality of the product and meet the requirements of the FFD&CA as amended.
9. "Paper Stock" shall mean any paper made from the following materials:
 - a. Paper and paperboard manufactured from clean, sanitary virgin chemical or mechanical pulp or from "broke and trim" of such paper and paperboard, provided they have been handled, treated and stored in a clean, sanitary manner, or reclaimed fiber using acceptable or approved protocol in compliance with 21 CFR 176.260; and
 - b. Components meeting the requirements of the FFD&CA as amended.
10. "Plastic Molding, Forming, Extrusion, and Laminating Resins" shall mean:
 - a. Resins or an intimate admixture of resins with other ingredients, which meet the requirements of the FFD&CA as amended;
 - b. Plastic composed solely of clean cuttings or regrind, provided they have been handled and maintained in a clean, sanitary manner; and
 - c. Recycled plastic material when it complies with a protocol that has been reviewed and accepted by FDA.
11. "Pre-forms" shall mean a component not in final form for filling.

12. "Product-Contact Surface" shall mean those surfaces of the container or closure with which the product comes in contact with.
13. "Production Scrap" shall mean material which remains from the manufacture of single-service containers or closures, that has been handled or treated in such a manner that it does not comply with the definition for "broke and trim" or "regrind", but may be collected for recycling. It may contain material such as containers or trim that have fallen on the floor.
14. "Regrind" shall mean clean plastic material that is trimmed from the container or closure, and imperfectly formed containers or closures, which result from the manufacture of single-service containers and closures, provided it is handled in a clean, sanitary manner. This may be in its trimmed or molded form and ground in a suitable grinder within the plant. It shall not include any material, container or closure which comes from an unapproved source or whose source, chemical content or treatment is unknown, or which may have poisonous or deleterious material retained in the plastic, which migrates to the food at levels exceeding regulatory levels. Regrind, when transported from one (1) approved plant to another, shall be shipped in suitable, clean, sealed, properly labeled containers. This definition shall not preclude the use of regrind plastic material when it complies with a protocol that has been reviewed and accepted by FDA.
15. "Sample Set" shall mean:
 - a. For the rinse test, a minimum of four (4) containers shall be tested.
 - b. For the swab test, a minimum of four (4), 50 square centimeter areas of surface from separate containers shall be tested. In the case of containers or closures with a product-contact surface area smaller than 50 square centimeters, more than four (4) containers or closures to equal at least 50 square centimeters times four (4) will be required to be swabbed.
16. "Sanitization" shall mean the application of any effective method or substance to properly cleaned surfaces for the destruction of pathogens and other microorganisms as far as is practicable. Such treatment shall not adversely affect the equipment, the milk and/or milk product, or the health of consumers, and shall be acceptable to the Regulatory Agency. Methods of sanitization shall meet the requirements contained in Appendix F. of this Ordinance.
17. "Single-Service Articles" shall mean articles that are constructed wholly, in part, or in combination from paper, paperboard, molded pulp, plastic, metals, coatings or similar materials and intended by the manufacturer for one (1) usage only.
18. "Single-Service Container" shall mean any container having a milk or milk product-contact surface and used in the packaging, handling or storage of Grade "A" milk and milk products which is intended for one (1) use only.

C. BACTERIAL STANDARDS AND EXAMINATION OF SINGLE-SERVICE CONTAINERS AND CLOSURES

1. Paper stock shall meet the bacteriological standard of not more than two hundred fifty (250) colonies per gram as determined by the disintegration test. The paper stock supplier shall certify that their paper stock was manufactured in compliance with this Standard. This applies only to the paper stock prior to lamination.
2. Where a rinse test can be used, the residual microbial count shall not exceed fifty (50) per container, except that in containers less than 100 mL, the count shall not exceed ten (10), or when using the swab test, not over fifty (50) colonies per 8 square inches (1 per square

- centimeter) of product-contact surface in three (3) out of four (4) samples taken at random on a given day. All single-service containers and closures shall be free of coliform organisms.
3. During any consecutive six (6) months, at least four (4) sample sets shall be collected in at least four (4) separate months, except when three (3) months show a month containing two (2) sampling dates separated by at least twenty (20) days, and analyzed at an Official, Commercial or Industry Laboratory approved by the State Milk Laboratory Certifying Agency specifically for the examinations required under these Standards. (Refer to Item 12p of this Ordinance for sampling of containers and closures in milk plants.)
 4. When a single-service container or closure is made from one (1) or more component parts as defined in this document, only those final assembled products that may have product-contact surface (s), must be sampled and tested for compliance with Section C.
 5. A sample set from each manufacturing line, as defined in these Standards, shall consist of a minimum of four (4) containers or closures, when the rinse test is used, or a minimum of four (4) 50 square centimeters (cm²) areas of surface, when the swab test is used.
 6. The following criteria pertains to manufacturers of pre-forms and bottles preformed at one (1) plant and molded at a second plant:
 - a. The pre-forming plant must be IMS Listed but sampling of the pre-forms is not required at this plant.
 - b. If the first pre-forming plant is also molding the containers into their final form, this plant must be listed and the containers must be sampled at this plant.
 - c. If the second plant, where containers are molded into their final form, is a single-service manufacturer, this plant must be listed and the containers must be sampled at this plant.
 - d. If the second plant is a milk plant where containers are molded into their final form, for use only in that milk plant, the milk plant listing is sufficient, but the containers must be sampled at this plant.

Procedures for obtaining samples and for the laboratory examination of these products are contained in the latest edition of SMEDP and shall be in substantial compliance with these methods. Such procedures and examinations shall be evaluated in accordance with the current revision of the EML. A list of approved laboratories may be found in the current IMS List, which is published by FDA and available on the Internet at www.fda.gov.

D. FABRICATION PLANT STANDARDS

NOTE: To be used in conjunction with Form FDA 2359c-SINGLE-SERVICE MANUFACTURING PLANT INSPECTION REPORT. (Refer to Appendix M.)

1. FLOORS

- a. The floors of all fabricating areas shall be smooth, impervious, and maintained in a state of good repair. The floors of storage rooms may be constructed of tightly joined wood.
- b. The joints between the walls and floor shall be tight, impervious and shall have coved or sealed joints.
- c. Where floor drains are provided, they shall be properly trapped and floors sloped to drain.

2. WALLS AND CEILINGS

- a. Walls and ceilings of fabricating areas shall have a smooth, cleanable, light-colored surface.
- b. Walls and ceilings in fabricating and storage areas shall be kept in good repair.
- c. The opening around pipes, tubes and similar items that extend through the walls and/or ceiling shall be effectively sealed.

3. DOORS AND WINDOWS

- a. All outside openings shall be effectively protected against the entry of insects, rodents, dust and airborne contamination.
- b. All outer doors shall be tight and self-closing.

4. LIGHTING AND VENTILATION

- a. All rooms shall be adequately lighted either by natural light, artificial light, or both. A minimum of twenty (20) foot-candles (220 lux) should be maintained in fabricating areas and five (5) foot-candles (55 lux) in storage areas. Packaging, sealing, wrapping, labeling and similar procedures are considered part of the fabricating area.
- b. Ventilation shall be sufficient to prevent excessive odors and the formation of excessive water condensation.
- c. The intake of all pressure ventilation systems in fabricating areas, whether they are positive or exhaust shall be properly filtered.

5. SEPARATE ROOMS

- a. All fabricating areas shall be separate from non-fabricating areas to protect against contamination. Provided, that if the entire plant meets all sanitation requirements and no source of cross contamination exists, separation between areas is not required.
- b. All regrinding of plastic and the shredding, packaging or baling of paper trim shall be conducted in rooms separate from the fabricating room, except that they may be conducted within the fabricating room, provided such operations are kept clean and free of dust.

6. TOILET FACILITIES - SEWAGE DISPOSAL

- a. Disposal of sewage and other wastes shall be in a public sewage system or in a manner in compliance with Local and State regulations.
- b. All plumbing shall comply with the Local and State plumbing regulations.
- c. Toilet rooms shall have solid, tight-fitting doors that are self-closing.
- d. The toilet room and fixtures shall be maintained in a clean and sanitary condition and kept in good repair.
- e. Each toilet room shall be well lighted and adequately ventilated. Air ventilation ducts from toilet facilities shall vent to the outside.
- f. Proper hand washing facilities with hot and cold and/or warm running water shall be provided in toilet rooms.
- g. All windows shall be effectively screened when open.

- h. Signs shall be posted in all toilet rooms reminding employees to wash their hands before returning to work.
- i. Eating and/or storage of food are prohibited in toilet rooms.

7. WATER SUPPLY

- a. The water supply, if from a public system, shall be approved as safe by the State Water Control Authority responsible for water quality, and in the case of individual water systems, comply with at least the specifications outlined in Appendix D. and the bacteriological standards outlined in Appendix G. of this Ordinance.
- b. There shall be no cross-connection between a safe water supply and any unsafe or questionable water supply or any source of pollution through which the safe water supply might become contaminated.
- c. Samples for bacteriological testing of individual water supplies are taken upon the initial approval of the physical structure; each twelve (12) months thereafter; and when any repair or alteration of the water supply system has been made. The examination of the sample shall be conducted in an Officially Designated Laboratory.
- d. Water baths utilizing recirculated water for cooling product-contact surfaces shall comply with the bacteriological standards outlined in Appendix G. of this Ordinance and shall be tested semi-annually.
- e. Records of all required water tests shall be maintained at a location acceptable to the Rating/Regulatory Agency for a period of two (2) years.

8. HAND WASHING FACILITIES

- a. Hot and cold and/or warm running water, soap, air dryers or individual sanitary towels shall be convenient to all fabricating areas. Provided, that solvent or soft soap dispensers, containing sanitizers, may be used if water is not available. When individual sanitary towels are used, covered trash containers shall be provided.
- b. Hand washing facilities shall be kept clean.

9. PLANT CLEANLINESS

- a. The floors, walls, ceilings, overhead beams, fixtures, pipes and ducts of production, storage, regrind, baling and compacting rooms shall be clean.
- b. All production areas, warehouse, toilet, lunch and locker rooms shall be free of evidence of insects, rodents, and birds.
- c. Machines and appurtenances shall be kept clean. Provided, that minor accumulations of paper, plastic or metal dust and other production soils incidental to normal fabricating operations do not violate this requirement.

10. LOCKER AND LUNCHROOMS

- a. Locker and lunchrooms shall be separate from plant operations and be equipped with self-closing doors.
- b. Eating and/or storage of food are prohibited in fabricating and storage areas.
- c. Locker and lunchrooms shall be kept in a clean and sanitary condition.
- d. Cleanable refuse containers, properly labeled, shall be provided, which are covered, impervious, leak-proof and readily accessible.

- e. Proper hand washing facilities shall be convenient to locker and lunchrooms.
- f. Signs shall be posted reminding employees to wash their hands before returning to work.

11. DISPOSAL OF WASTES

- a. All refuse and garbage shall be stored in covered, impervious and leak-proof containers. This requirement does not pertain to production scrap.
- b. All waste containers shall be clearly labeled for their intended purpose and contents.
- c. Where possible, garbage and assorted rubbish should be stored outside the building in covered, impervious, cleanable containers. If stored inside the building, it must be contained in similar receptacles, but in an area separate from fabricating areas.

12. PERSONNEL - PRACTICES

- a. Hands shall be thoroughly washed before commencing plant functions and as often as may be required to remove soil and contamination, and before returning to work after visiting the toilet room or lunchroom.
- b. All personnel shall wear clean outer garments and effective hair restraints.
- c. No person affected with any disease in a communicable form, or while a carrier of such disease, and no person with an infected cut or lesion shall work in any processing area in any capacity where there is a likelihood of such person contaminating product or product-contact surfaces with pathogenic organisms. (Refer to Sections 13 and 14 of this Ordinance)
- d. The use of tobacco products is prohibited in fabricating, regrind and storage areas.
- e. Insecured jewelry shall not be permitted in fabricating areas.

13. PROTECTION FROM CONTAMINATION

- a. All product-contact surfaces of containers, closures and all materials in process are covered or otherwise protected to prevent the access of insects, dust, condensation and other contamination.
- b. Whenever air under pressure is directed at resin, regrind, colorants and similar materials or a product-contact surface, it shall be free of oil, dust, rust, excessive moisture, extraneous materials and odor and shall otherwise comply with the applicable requirements of Appendix H. of this Ordinance.
- c. Air that is directed at product or product-contact surfaces by fans or blowers shall be filtered and shall otherwise comply with the applicable requirements of Appendix H. of this Ordinance.
- d. Only pesticides approved for use in food plants and registered with the EPA shall be used for insect and rodent control.
- e. Pesticides shall be used in accordance with the manufacturer's directions and used so as to preclude the contamination of containers or closures.
- f. Single-service articles in process shall be protected from contamination by use of a single-service cover sheet or other protective device. This includes chipboard, dividers, separators, bags and other items that can become contact surfaces.

- g. Single-service containers and closures for milk and milk products shall not be fabricated on equipment used for the manufacture of products made of non-food-grade materials, unless such equipment has been thoroughly cleaned and/or purged of all non-food-grade material by a process that will not contaminate the food-grade material.
- h. The manufacture of single-service containers and closures for milk and milk products shall be carried on in such a manner that there will be no cross contamination of raw material or regrind with non-food-grade materials.
- i. Equipment and operations are so located within the plant as to prevent overcrowding and allow for cleaning and maintenance procedures.
- j. All toxic chemicals, including cleaning and maintenance compounds, shall be adequately segregated from raw materials and finished product.
- k. Food containers manufactured by the facility shall not be used for storing miscellaneous items or chemicals.

14. STORAGE OF MATERIALS AND FINISHED PRODUCT

- a. Blanks, roll stock and all other single-service containers, closures and articles shall be stored off the floor by use of pallets, slip-sheets or other methods and away from any wall a sufficient distance to facilitate inspection, cleaning and pest control activities. Any roll stock having dirty or soiled outer turns and/or edges shall have sufficient turns discarded prior to use and the edges trimmed to provide protection from contamination.
- b. Appropriate clean, dry storage facilities shall be provided for single-service containers, closures, paper for wrapping, adhesives, blanks and other production material to provide protection from splash, insects, dust and other contamination.
- c. Where containers and closures are pre-formed in plants other than the original fabricating facility:
 - 1. (1) Containers, blanks and closures shall be stored in the original cartons and sealed until used; and
 - 2. (2) Partially used cartons of containers, blanks and closures shall be resealed until used.
- d. Containers used for the storage of resin and other raw materials, regrind, broke and trim, intended for use in the process, shall be covered, clean, impervious and properly identified. Reuse of storage containers, such as gaylords, is permitted provided single-use plastic liners are used.
- e. In-process storage bins that touch the product-contact surface of containers or closures shall be constructed of cleanable, nonabsorbent material and kept clean.

15. FABRICATING EQUIPMENT

The requirements of this Section pertain to all equipment and processes used in the fabrication of containers and closures, irrespective of the materials used and whether or not mentioned herein. Some of this equipment includes grinders, rollers, reamers and cutters, molders and fittings, extruders, silos, resin bins and hoppers, printing equipment, blanking equipment and sealing equipment.

- a. Rolls, dies, belts, tables, mandrels, transfer tubing and all other contact surfaces shall be kept clean, sanitary and reasonably free of accumulation of paper, plastic or metal dust and other production soils. Equipment designed for milk plant use, which is utilized for pre-forming containers, shall be clean and sanitized prior to operation.

- b. Makeshift devices such as tape, rope, twine, paperboards, etc., shall not be used. All fasteners, guides, hangers, supports and baffles shall be constructed of impervious, cleanable materials and kept in good repair.
- c. Take-off tables and other container contact surfaces shall be constructed of cleanable material, kept clean and in good repair.
- d. All grinders, shredders and similar equipment used for regrinding shall be installed above the floor or installed in such a manner that they are protected, so that floor sweepings and other contaminants cannot enter the grinder or shredder.
- e. Storage tanks, silos, gaylords or bins used for plastic resins shall be so constructed to protect the resin from contamination. All air vents shall be filtered to prevent the entrance of dust, dirt, or insects. Air tubes used to convey resin shall be in good repair and installed in such a manner that protects the resin from contamination. Air tubes used to convey resin shall have end caps, attached by a chain or cable that prevents contamination. This Item also applies to all raw materials handled in like manner.

16. MATERIALS FOR CONSTRUCTION OF CONTAINERS AND CLOSURES

- a. Only plastic sheeting and extrusions, plastic laminated paper, roll stock, component part(s), molded or formed parts, metal and paperboard blanks, or combinations thereof, from a manufacturing and/or fabricating plant conforming to these Standards, shall be used. Fabricating plants listed in the current IMS List shall be considered in compliance with this Item.
- b. Only food-grade, non-toxic lubricants shall be used on container or closure-contact surfaces. Excess lubricant shall be removed from surfaces close to shafts, rollers, bearing sleeves and mandrels. These lubricants shall be handled and stored in a manner that will prevent cross contamination with non-food-grade lubricants. Such storage areas shall be clean and adequately ventilated.
- c. Containers, resin and flashing on the floor, floor sweepings of production materials and production scrap are prohibited from being reused. This shall not preclude the use of these materials when they comply with a recycling protocol that has been reviewed and accepted by FDA.

17. WAXES, ADHESIVES, SEALANTS, COATINGS AND INKS

- a. Waxes, adhesives, sealants, coatings and inks used for containers and closures shall be handled and stored in a manner that will prevent cross contamination with similar non-food-grade materials. Such storage areas shall be clean and adequately ventilated.
- b. Unused materials shall be covered, labeled and properly stored.
- c. Waxes, adhesives, sealants, coatings and inks shall not impart odor or taste to the milk or milk products and shall not contaminate the product with microorganisms or toxic or injurious substances. All materials that are applied to the product-contact surface shall comply with the requirements of 21 CFR Parts 175-178.
- d. Transfer containers shall be kept clean and shall be properly identified and covered.
- e. Waxing shall be performed so as to assure that containers or closures are completely coated and the wax shall be kept at a temperature of 60°C (140°F) or higher.

18. HANDLING OF CONTAINERS AND EQUIPMENT

- a. Handling container and closure surfaces shall be kept to a minimum.

- b. Handlers shall sanitize their hands frequently or wear clean, single-use gloves. Hand sanitizing dispensers, if used, shall be located convenient to all operations involving manual contact.

19. WRAPPING AND SHIPPING

- a. Blanks, closures, halves, nested or pre-formed containers and parts such as valves, hoses, tubes and other fittings shall be properly packaged or containerized prior to shipping.
- b. The outer package or containerized units shall protect the contents from dust and other contamination.
- c. Transportation vehicles used to ship finished materials from the single-service container or closure plant or within the plant shall be clean and in good repair and shall not have been used for the transportation of garbage, waste or toxic materials.
- d. Paperboard containers, wrappers, and dividers that contact the surface of the container or closure shall not be reused for this purpose.
- e. All packaging materials that contact the product-contact surface of the container or closure shall comply with the requirements of 21 CFR Parts 175-178 and the bacteriological standards of Section C of these Standards, but the materials do not have to be manufactured at a listed single-service plant. Some outer packaging material such as corrugated cardboard boxes used for the packaging of milk carton flats, are exempt from this bacteriological standard. The edges of these flats are subject to heat during the forming and sealing of the container.

20. IDENTIFICATION AND RECORDS

- a. Outer wrappings shall be identified with the name and city of the plant where the contents are fabricated, except those manufactured in, and which are only for use in the same facility. Where several plants are operated by one (1) firm, the common firm name may be utilized, provided that the location of the plant at which the contents were fabricated is also shown either directly or by the Federal Information Processing Standards (FIPS) numerical code on the outer wrapper.
- b. Records of all required bacteriological tests of containers and closures shall be maintained at the plant of manufacture for two years and results shall be in compliance with Section C of these Standards.
- c. It is the responsibility of the inspected/certified and listed plant to maintain records verifying the bacterial and chemical safety of all component parts utilized in the final assembled product.
- d. The fabricating plant shall have on file information from suppliers of raw material, waxes, adhesives, sealants, coatings and inks indicating that the material complies with the requirements of 21 CFR Parts 175 - 178.
- e. The fabricating plant shall have on file information from the suppliers of packaging materials specified in these Standards indicating that the material complies with the requirements of 21 CFR Parts 175-178 and the bacteriological standards of Section C. of these Standards. There are no specifications for sampling frequency. The Regulatory Agency may choose to collect samples of packaging materials to determine compliance with bacteriological standards of this Section.
- f. Multi-plant corporations may have all the required information at a central location as long as it can be transmitted to the site upon request.

21. SURROUNDINGS

- a. Exterior surroundings shall be neat and clean and free from conditions that might attract or harbor flies, other insects and rodents.
- b. Driveways, lanes and areas serving the plant vehicular traffic are graded, drained and free from pools of standing water.

SECTION 22: Appendix D. Standards For Water Sources

The Grade "A" PMO, formal FDA interpretations of the Grade "A" PMO and other written USPHS/FDA opinions will be used in evaluating the acceptability of individual water supplies and water system construction requirements at dairy farms, milk plants, and single-service container manufacturing facilities.

State Water Control Authority requirements, which are less stringent than the Grade "A" PMO, shall be superseded by the Grade "A" PMO. State Water Control Authority requirements, which are stricter than the Grade "A" PMO, shall not be considered in determining the acceptability of water supplies during ratings, check ratings, single-service listing evaluations and audits. For example, the Grade "A" PMO requires a satisfactory farm water sample every three (3) years. If State law required such samples to be taken annually, a SRO conducting a sanitation rating, which includes that farm, will give that farm full credit for water sample frequency, if the Grade "A" PMO three (3) year requirement is met, even though, the State required annual frequency is not met. Supplies other than individual water supplies, which have been approved as safe by the State Water Control Authority, shall be considered to be acceptable sources as provided in Section 7 of this Ordinance for Grade "A" inspections, as well as for all other IMS purposes without further inspection of the spring, well or reservoir treatment facility(ies), testing records, etc.

I. LOCATION OF WATER SOURCES

DISTANCE FROM SOURCES OF CONTAMINATION

All ground water sources should be located a safe distance from sources of contamination. In cases where sources are severely limited; however, a ground water aquifer that might become contaminated may be considered for a water supply, if treatment is provided. After a decision has been made to locate a water source in an area, it is necessary to determine the distance the source should be placed from the origin of contamination and the direction of water movement. A determination of a safe distance is based on specific local factors described in the following Section on SANITARY SURVEY.

Because many factors affect the determination of "safe" distances between ground water supplies and sources of pollution, it is impractical to set fixed distances. Where insufficient information is available to determine the "safe" distance, the distance should be the maximum that economics, land ownership, geology and topography will permit. It should be noted that the direction of ground water flow does not always follow the slope of the land surface. A person with sufficient training and experience to evaluate all of the factors involved should inspect each installation.

Since the safety of a ground water source depends primarily on considerations of good well construction and geology, these factors should be the guides in determining safe distances for different situations. The following criteria apply only to properly constructed wells, as described in this Appendix. There is no safe distance for a poorly constructed well.

When a properly constructed well penetrates an unconsolidated formation, with good filtering properties, and when the aquifer itself is separated from sources of contamination by similar materials, research and experience have demonstrated that 15 meters (50 feet) is an adequate distance separating the two. Lesser distances should be accepted, only after a comprehensive sanitary survey, conducted

by qualified Local or State Agency Officials, has determined such lesser distances are both necessary and safe.

If it is proposed to install a properly constructed well in formations of unknown character, the State or U.S. Geological Survey and the Local or State Health Agency should be consulted.

When wells must be constructed in consolidated formations, extra care should always be taken in the location of the well and in setting "safe" distances, since pollutants have been known to travel great distances in such formations. The owner should request assistance from the Local or State Health Agency.

The following Table is offered as a guide in determining acceptable distances of a well from sources of contamination:

Table 10. Distance of a Well from Sources of Contamination	
Formation	Minimum Acceptable Distance of a Well from Sources of Contamination
Favorable (Unconsolidated)	15 meters (50 feet) - Lesser distances only on Health Department approval following a comprehensive sanitary survey of the proposed site and immediate surroundings.
Unknown	15 meters (50 feet) - Only after a comprehensive geological survey of the site and its surroundings has established, to the satisfaction of the Health Department that favorable formations do exist.
Poor (Consolidated)	Safe distances can be established only following both the comprehensive geological and comprehensive sanitary surveys. These surveys also permit determining the direction in which a well may be located with respect to sources of contamination. In no case should the acceptable distance be less than 15 meters (50 feet).

EVALUATING CONTAMINATION THREATS TO WELLS

Conditions unfavorable to the control of contamination and that may require specifying greater distances between a well and sources of contamination are:

1. **Nature of the Contaminant:** Human and animal excreta and toxic chemical wastes are serious health hazards. Salts, detergents and other substances that dissolve in water can mix with ground water and travel with it. They are not ordinarily removed by natural filtration.
2. **Deeper Disposal:** Cesspools, dry wells, disposal and waste injection wells and deep leaching pits that reach aquifers or reduce the amount of filtering earth materials between the wastes and the aquifer increase the danger of contamination.
3. **Limited Filtration:** When earth materials surrounding the well and overlying the aquifer are too coarse to provide effective filtration, as in limestone, coarse gravel, etc., or when they form a layer too thin, the risk of contamination is increased.
4. **The Aquifer:** When the materials of the aquifer itself are too coarse to provide good filtration, as in limestone, fractured rock, etc., contaminants entering the aquifer through outcrops or excavations may travel great distances. It is especially important in such cases to know the direction of ground water flow and whether there are outcrops of the formation, or excavations reaching it, "upstream" and close enough to be a threat.

5. **Volume of Waste Discharged:** Since greater volumes of wastes discharged and reaching an aquifer can significantly change the slope of the water table and the direction of ground water flow, it is obvious that heavier discharges can increase the threat of contamination.
6. **Contact Surface:** When pits and channels are designed and constructed to increase the rate of absorption, as in septic tank leaching systems, cesspools and leaching pits, more separation from the water source will be needed than when tight sewer lines or waste pipes are used.
7. **Concentration of Contamination Sources:** The existence of more than one source of contamination, contributing to the general area, increases the total pollution load and, consequently, the danger of contamination.

SANITARY SURVEY

The importance of a sanitary survey of water sources cannot be overemphasized. With a new supply, the sanitary survey should be made in conjunction with the collection of initial engineering data, covering the development of a given source and its capacity to meet existing and future needs. The sanitary survey should include the detection of all health hazards and the assessment of their present and future importance. Persons trained and competent in public health engineering and the epidemiology of waterborne diseases should conduct the sanitary survey. In the case of an existing supply, the sanitary survey should be made at a frequency compatible with the control of the health hazards and the maintenance of a good sanitary quality. The information furnished by the sanitary survey is essential to complete the interpretation of bacteriological and frequently the chemical data. This information should always accompany the laboratory findings. The following outline covers the essential factors that should be investigated or considered in a sanitary survey. Not all of the Items are pertinent to any one (1) supply and, in some cases; Items not in the list would be important additions to the survey list.

Ground Water Supplies:

1. Character of local geology and slope of ground surface.
2. Nature of soil and underlying porous strata; whether clay, sand, gravel, rock (especially porous limestone); coarseness of sand or gravel; thickness of water-bearing stratum; and depth to water table and location; and log and construction details of local wells in use and abandoned.
3. Slope of water table, preferably determined from observational wells or as indicated, presumptively, but not certainly, by the slope of ground surface.
4. Extent of drainage area likely to contribute water to the supply.
5. Nature, distance and direction of local sources of pollution.
6. Possibility of surface-drainage water entering the supply and of wells becoming flooded and methods of protection.
7. Methods used for protecting the supply against pollution by means of sewage treatment, waste disposal and the like.
8. **Well Construction:**
 - a. Total depth of well.
 - b. Casing: Diameter; wall thickness; material; and lengths from surface.
 - c. Screen or Perforations: Diameter; material; construction; locations; and lengths.
 - d. Formation Seal: Material, cement, sand, bentonite, etc.; depth intervals; annular thickness; and method of placement.

9. Protection of Well at Top: Presence of sanitary well seal; casing height above ground floor or flood level; protection of well vent; and protection of well from erosion and animals.
10. Pump-house Construction: Floors, drains, etc.; capacity of pumps; and draw-down when pumps are in operation.
11. Availability of an Unsafe Supply: Usable in place of normal supply, hence involving danger to the public health.
12. Disinfection Equipment: Supervision; test kits or other types of laboratory control.

Surface Water Supplies:

1. Nature of Surface Geology: Character of soils and rocks.
2. Character of Vegetation: Forests; cultivated and irrigated land; including salinity, effect on irrigation water, etc.
3. Population and sewered population per square mile of catchment area.
4. Methods of sewage disposal, whether by diversion from watershed or by treatment.
5. Character and efficiency of sewage-treatment works on watershed.
6. Proximity of sources of fecal pollution to intake of water supply.
7. Proximity, sources and character of industrial wastes, oil field brines, acid mine waters, etc.
8. Adequacy of supply as to quantity.
9. For Lake or Reservoir Supplies: Wind direction and velocity data; drift of pollution; sunshine data; and algae.
10. Character and Quality of Raw Water: Coliform organisms (MPN); algae; turbidity; color; and objectionable mineral constituents.
11. Nominal period of detention in reservoirs or storage basin.
12. Probable minimum time required for water to flow from sources of pollution to reservoir and through reservoir intake.
13. Shape of reservoir, with reference to possible currents of water, induced by wind or reservoir discharge, from inlet to water supply intake.
14. Protective measures in connection with the use of watershed to control fishing, boating, landing of airplanes, swimming, wading, ice cutting and permitting animals on marginal shore areas and in or upon the water, etc.
15. Efficiency and constancy of policing.
16. Treatment of Water: Kind and adequacy of equipment; duplication of parts; effectiveness of treatment; adequacy of supervision and testing; contact period after disinfection; and free chlorine residuals carried.
17. Pumping Facilities: Pump-house; pump capacity; standby units; and storage facilities.

II. CONSTRUCTION

SANITARY CONSTRUCTION OF WELLS

The penetration of a water-bearing formation by a well provides a direct route for possible contamination of the ground water. Although there are different types of wells and well construction, there are basic sanitary aspects that must be considered and followed:

1. The annular space outside the casing shall be filled with a watertight cement grout or puddled clay from a point just below the frost line or deepest level of excavation near the well to as deep as necessary to prevent entry of contaminated water.
2. For artesian aquifers, the casing shall be sealed into the overlying impermeable formations so as to retain the artesian pressure.
3. When a water-bearing formation containing water of poor quality is penetrated, the formation shall be sealed off to prevent the infiltration of water into the well and aquifer.
4. A sanitary well seal, with an approved vent, shall be installed at the top of the well casing to prevent the entrance of contaminated water or other objectionable material.

Well Casing or Lining: All that part of the suction pipe or drop pipe of any well within 3 meters (10 feet) of and below the ground surface shall be surrounded by a watertight casing pipe extending above the ground, platform or floor surface, as the case maybe, and covered at the top as herein provided. The casing of every well shall terminate above the ground level; the annular space outside the casing shall be filled with a watertight cement grout or clay, with similar sealing properties, from the surface to a minimum of 3 meters (10 feet) below the ground surface. A dug well, in lieu of a casing pipe, may be provided with a substantial watertight lining of concrete, vitrified tile with outer concrete lining, or other suitable material. Such lining shall extend at least 3 meters (10 feet) below the surface and shall extend up to the well platform or pump room floor with a watertight connection. In such case, the platform or floor shall have a suitable sleeve pipe, surrounding the suction pipe or drop pipe, and projecting above as herein provided for a casing pipe.

Well Covers and Seals: Every well shall be provided with an overlapping, tight-fitting cover at the top of the casing or pipe sleeve to prevent contaminated water or other material from entering the well.

The sanitary well seal, in a well exposed to possible flooding, shall be either watertight or elevated at least .6 meters (2 feet) above the highest known flood level. When it is expected that a well seal may become flooded, it shall be watertight and equipped with a vent line, whose opening to the atmosphere, is at least .6 meters (2 feet) above the highest known flood level.

The seal in a well not exposed to possible flooding shall be either watertight, with an approved vent line, or self-draining, with an overlapping and downward flange. If the seal is of the self-draining, non-watertight, type, all openings in the cover should be either watertight or flanged upward and provided with overlapping, downward flanged covers.

Some pump and power units have closed bases that effectively seal the upper terminal of the well casing. When the unit is the open type, or when it is located at the side, as with some jet and suction pump type installations, it is especially important that a sanitary well seal be used. There are several acceptable designs consisting of an expandable neoprene gasket, compressed between two (2) steel plates. They are easily installed and removed for well servicing. Pump and water well suppliers normally stock sanitary well seals.

If the pump is not installed immediately after well drilling and placement of the casing, the top of the casing should be closed with a metal cap screwed or tack welded into place, or covered with a sanitary well seal.

For large diameter wells, such as dug wells, it would be difficult to provide a sanitary well seal, consequently, a reinforced concrete slab, overlapping the casing and sealed to it with a flexible seal and/or rubber gasket, should be installed. The annular space outside the casing should first be filed with suitable grouting or sealing materials, i.e., cement, clay, or fine sand.

A well slab alone is not an effective sanitary defense, since it can be undermined by burrowing animals and insects, cracked from settlement or frost heave or broken by vehicles and vibrating machinery. The cement grout formation seal is far more effective. It is recognized however, that there are situations that call for a concrete slab or floor around the well casing to facilitate cleaning and improve appearance. When such a floor is necessary, it shall be placed only after the formation seal and the pit-less installation have been inspected.

Well covers and pump platforms shall be elevated above the adjacent finished ground level. Pump room floors shall be constructed of reinforced, watertight concrete and carefully leveled or sloped away from the well, so that surface and wastewater cannot stand near the well. The minimum thickness of such a slab or floor shall be 10 centimeters (4 inches). Concrete slabs or floors shall be poured separately from the cement formation seal and when the threat of freezing exists, insulated from it and the well casing by a plastic or mastic coating or sleeve to prevent bonding of the concrete to either.

All water wells shall be readily accessible at the top for inspection, servicing and testing. This requires that any structure over the well be easily removable to provide full, unobstructed access for well servicing equipment. The so-called "buried seal," with the well cover buried under several meters (yards) of earth, is unacceptable because:

1. It discourages periodic inspection and preventive maintenance;
2. It makes severe contamination during pump servicing and well repair more likely;
3. Any well servicing is more expensive; and
4. Excavation to expose the top of the well increases the risk of damage to the well, the cover, the vent and the electrical connections.

Well Pits and Drainage: Because of the pollution hazards involved, the well head, well casing, pump, pumping machinery, valve connected with the suction pump or exposed suction pipe shall not be permitted in any pit, room or space extending below ground level, or in any room or space above the ground, which is walled-in or otherwise enclosed, so that it does not have free drainage by gravity to the surface of the ground. Provided, that a dug well properly constructed, lined and covered, as herein prescribed, shall not be construed to be a pit. Provided further, that pumping equipment and appurtenances may be located in a residential basement, which is not subject to flooding. And provided further, that in the case of existing water supplies which otherwise comply with the applicable requirements of this Appendix, pit installations may be accepted, under the following conditions, when permitted by the State Water Control Authority:

1. Pits shall be of watertight construction, with walls extending at least 15 centimeters (6 inches) above the established ground surface at all points.
2. Pits shall be provided with a watertight, concrete floor, sloping to a drain which discharges to the ground surface at a lower elevation than the pit, and preferably at least 9 meters (30 feet)

- from it; or if this should be impossible, to a watertight, concrete sump, in the pit, equipped with a sump-pump discharging to the ground surface, preferably at least 9 meters (30 feet) from the pit.
3. Pits shall be provided with a concrete base for pumps or pumping machinery, so that such units shall be located at least 30 centimeters (12 inches) above the floor of the pit.
 4. Pits shall be provided with a watertight housing or cover in all cases.
 5. If inspection should reveal that these conditions are not being properly maintained, the supply shall be disapproved.

NOTE: The Grade "A" PMO permits the acceptance of pit installations on existing water supplies but prohibits the installation of well pits on new water supplies. For well pits, "existing water supplies", are those, which were in use by a producer at the time they applied for a Grade "A" permit. Therefore, pit installations, which meet the above criteria, would be acceptable. Changes in construction and extensive alterations of an existing water supply that does not affect the physical structure of the well pit does not require elimination of the well pit.

Manholes: Manholes may be provided on dug wells, reservoirs, tanks and other similar features of water supplies. A manhole, if installed, shall be provided with a curb, the top of which extends at least 10 centimeters (4 inches) above the slab and shall be equipped, where necessary for physical protection, with a locked or bolted overlapping watertight cover. The sides of which extend downward at least 5 centimeters (2 inches). The covers shall be kept closed at all times, except when it may be necessary to open the manhole.

Vent Opening: Any reservoir, well, tank or other structure containing water for the dairy water supply may be provided with vents, overflows, or water-level control gauges, which shall be so constructed as to prevent the entrance of birds, insects, dust, rodents or contaminating material of any kind. Openings on vents shall be not less than 46 centimeters (18 inches) above the floor of a pump room, or above the roof or cover of a reservoir. Vent openings on other structures shall be at least 46 centimeters (18 inches) above the surface on which the vents are located. Vent openings shall be turned down and screened with corrosion-resistant screen of not less than 16 x 20 mesh. Overflow outlets shall discharge above and not less than 15 centimeters (6 inches) from a roof, roof drain, floor, and floor drain or over an open water-supplied fixture. The overflow outlet shall be covered by a corrosion-resistant screen of not less than 16 x 20 mesh and by 0.6 centimeters (1/4 inch) hardware cloth, or shall terminate in a horizontal angle seat check-valve.

DEVELOPMENT OF SPRINGS

There are two (2) general requirements necessary in the development of a spring, used as a source of domestic water:

1. Selection of a spring with adequate capacity to provide the required quantity and quality of water for its intended use throughout the year.
2. Protection of the sanitary quality of the spring. The measures taken to develop a spring must be tailored to its geological conditions and sources.

The features of a spring encasement are the following:

1. An open-bottom, watertight basin intercepting the source, which extends to bedrock or a system of collection pipes and a storage tank;

2. A cover that prevents the entrance of surface drainage or debris into the storage tank;
3. Provisions for the cleanout and emptying of the tank contents;
4. Provision for overflow; and
5. A connection to the distribution system or auxiliary supply. (Refer to Figure 12)

A tank is usually constructed in place with reinforced concrete, of such dimensions, as to enclose or intercept as much of the spring as possible. When a spring is located on a hillside, the downhill wall and sides are extended to bedrock or to a depth that will insure maintenance of an adequate water level in the tank. Supplementary cutoff walls, of concrete or impermeable clay, extending laterally from the tank may be used to assist in controlling the water table in the locality of the tank. The lower portion of the uphill wall of the tank can be constructed of stone, brick or other material, so placed that water may move freely into the tank from the formation. Backfill of graded gravel and sand will aid in restricting movement of fine material from the formation toward the tank.

The tank cover shall be cast in place to insure a good fit. Forms should be designed to allow for shrinkage of concrete and expansion of form lumber. The cover shall extend down over the top edge of the tank at least 5 centimeters (2 inches). The tank cover shall be heavy enough so that it cannot be dislodged by children and shall be equipped for locking.

A drainpipe with an exterior valve shall be placed close to the wall of the tank, near the bottom. The pipe shall extend horizontally so as to clear the normal ground level at the point of discharge by at least 15 centimeters (6 inches). The discharge end of the pipe shall be screened to prevent the entrance of rodents and insects.

The overflow is usually placed slightly below the maximum water-level elevation and screened. A drain apron of rock shall be provided to prevent soil erosion at the point of overflow discharge.

The supply outlet, from the developed spring, shall be located at least 15 centimeters (6 inches) above the drain outlet and properly screened. Care shall be taken in casting pipes into the walls of the tank to insure a good bond with the concrete and freedom from honeycombs around the pipes.

SANITARY PROTECTION OF SPRINGS

Springs usually become contaminated when barnyards, sewers, septic tanks, cesspools or other sources of pollution are located on higher adjacent land. In limestone formations however, contaminated material frequently enters the water-bearing channels through sinkholes or other large openings and may be carried along with ground water for long distances. Similarly, if material from such sources of contamination finds access to the tubular channels in glacial drift, this water may retain its contamination for long periods of time and for long distances.

The following precautionary measures will help to insure developed spring water of consistently high quality:

1. Provide for the removal of surface drainage from the site. A surface drainage ditch shall be located uphill from the source so as to intercept surface-water runoff and carry it away from the source. Location of the ditch and the points at which the water should be discharged are a matter of judgment. Criteria used should include the topography, the subsurface geology, land ownership and land use.

2. Construct a fence to prevent entry of livestock. Its location should be guided by the considerations mentioned in Item 1. The fence shall exclude livestock from the surface-water drainage system at all points uphill from the source.
3. Provide for access to the tank for maintenance, but prevent removal of the cover by a suitable locking device.
4. Monitor the quality of the spring water with periodic checks for contamination. A marked increase in turbidity or flow after a rainstorm is a good indication that surface runoff is reaching the spring.

SURFACE WATER

The selection and use of surface water sources, for individual water supply systems, require consideration of additional factors not usually associated with ground water sources. When small streams, open ponds, lakes or open reservoirs must be used as sources of a water supply, the danger of contamination and the consequent spread of enteric diseases, such as typhoid fever and dysentery is increased. As a rule, surface water shall be used only when ground water sources are not available or are inadequate. Clear water is not always safe, and the old saying that running water "purifies itself", to drinking water quality, within a stated distance is false.

The physical and bacteriological contamination of surface water makes it necessary to regard such sources of supply as unsafe for domestic use, unless reliable treatment, including filtration and disinfection, is provided.

The treatment of surface water to insure a constant, safe supply requires diligent attention to operation and maintenance by the owner of the system.

When ground water sources are limited, consideration shall be given to their development for domestic purposes only. Surface water sources can then provide water needed for stock and poultry watering, gardening, fire-fighting and similar purposes. Treatment of surface water, used for livestock, is not generally considered essential. There is however, a trend to provide stock and poultry drinking water that is free from bacterial contamination and certain chemical elements.

Where the final resort must be made to surface water for all uses, a wide variety of sources, including farm ponds, lakes, streams and the roof runoff of buildings may be considered. These sources are regarded, without exception, to be contaminated, and their use cannot be condoned unless an individually tailored treatment process can be used, which will make them safe and satisfactory. Such treatment may include aeration and the use of suitable filtration or precipitation devices to remove suspended matter, in addition to routine full-time disinfection.

The milk producer or milk plant operator, who is considering surface sources of water for milking, milk house and milk plant, receiving station or transfer station operations shall receive the advance approval of the Regulatory Agency and shall comply with all applicable requirements of the State Water Control Authority on the construction, protection and treatment of the chosen supply.

NOTE: The EPA publishes a document entitled Manual of Individual Water Supply Systems that is an excellent source of detailed information on the development, construction and operation of individual water systems and also contains a suggested well-drilling code.

III. DISINFECTION OF WATER SOURCES

All newly constructed or newly repaired wells shall be disinfected to counteract contamination introduced during construction or repair. Every well shall be disinfected immediately after construction or repair and flushed prior to bacteriological testing.

An effective and economical method of disinfecting wells and appurtenances is the use of calcium hypochlorite, containing approximately seventy percent (70%) available chlorine. This chemical can be purchased in granular form at hardware stores, swimming pool equipment supply outlets or chemical supply houses.

When used in the disinfection of wells, calcium hypochlorite should be added in sufficient amounts to provide a dosage of approximately 50 mg. available chlorine per liter (50mg/L) in the well water. This concentration is roughly equivalent to a mixture of 1 gram (0.03 ounce) of dry chemical per 13.5 liters (3.56 gallons) of water to be disinfected. A stock solution of disinfectant may be prepared by mixing 30 grams (1 ounce) of high-test hypochlorite with 1.9 liters (2 quarts) of water. Mixing is facilitated if a small amount of the water is first added to the granular calcium hypochlorite and stirred to a smooth watery paste free of lumps. The stock solution should be stirred thoroughly for ten (10) to fifteen (15) minutes. The inert ingredients should then be allowed to settle. The liquid containing the chlorine should be used and the inert material discarded. Each 1.9 liters (2 quarts) of stock solution will provide a concentration of approximately 50 mg/L when added to 378 liters (100 gallons) of water. The solution should be prepared in a clean utensil. The use of metal containers should be avoided, as they are corroded by strong chlorine solutions. Crockery, glass or rubber lined containers are recommended.

Where small quantities of disinfectant are required and a scale is not available, the material can be measured with a spoon. A heaping tablespoonful of granular calcium hypochlorite weighs approximately 14 grams (1/2 ounce).

When calcium hypochlorite is not available, other sources of available chlorine such as sodium hypochlorite (12-15% of volume) can be used. Sodium hypochlorite, which is also commonly available as liquid household bleach with 5.25% available chlorine, can be diluted with two (2) parts of water to produce the stock solution. 1.9 liters (2 quarts) of this solution can be used for disinfecting 378 liters (100 gallons) of water.

Stock solutions of chlorine in any form will deteriorate rapidly unless properly stored. Dark glass or plastic bottles with airtight caps are recommended. Bottles containing solution should be kept in a cool place and protected from direct sunlight. If proper storage facilities are not available, the solution should always be prepared fresh, immediately before use.

Complete information concerning the test for residual chlorine is included in the latest edition of Standard Methods for the Examination and Wastewater (SMEWW), published by APHA.

DUG WELLS

After the casing or lining has been completed, follow the procedure outlined below:

1. Remove all equipment and materials that will not form a permanent part of the completed structure.
2. Using a stiff broom or brush, wash the interior walls of the casing or lining with a strong solution (100 mg/L of chlorine) to insure thorough cleaning and sanitizing.

3. Place the cover over the well and pour the required amount of chlorine solution into the well through the manhole or pipe opening just before inserting the pump cylinder and drop-pipe assembly. The chlorine solution should be distributed over as much of the surface of the water as possible to obtain proper diffusion of the chemical through the water hose or pipeline, as the line is being alternately raised and lowered. This method should be followed whenever possible.
4. Wash the exterior surface of the pump cylinder and drop pipe, with the chlorine solution, as the assembly is being lowered into the well.
5. After the pump has been set in position, pump water from the well and through the entire water distribution system to the milk house until a strong odor of chlorine is noted.
6. Allow the chlorine solution to remain in the well for at least twenty-four (24) hours.
7. After twenty-four (24) hours or more have lapsed, flush the well to remove all traces of chlorine.

DRILLED, DRIVEN, AND BORED WELLS

After the casing or lining has been completed, follow the procedure outlined below:

1. Remove all equipment and materials that will not form a permanent part of the completed structure.
2. When the well is being tested for yield, the test pump should be operated until the well water is clear and as free from turbidity as possible.
3. After the testing equipment has been removed, slowly pour the required amount of chlorine solution into the well just before installing the permanent pumping equipment. Diffusion of the chemical with the well water may be facilitated as previously described.
4. Wash the exterior surface of the pump cylinder and drop pipe with chlorine solution as the assembly is being lowered into the well.
5. After the pump has been set in position, operate the pump until the water, discharged through the entire distribution system to waste, has a distinct odor of chlorine. Repeat this procedure a few times, at one (1) hour intervals, to insure complete circulation of the chlorine solution through the column of water in the well and the pumping equipment.
6. Allow the chlorine solution to remain in the well for at least twenty-four (24) hours.
7. After twenty-four (24) hours or more have elapsed, flush the well to remove all traces of chlorine. The pump should be operated until water discharged to waste is free from the chlorine odor.

In the case of deep wells having a high water level, it may be necessary to resort to special methods of introducing the disinfecting agent into the well so as to insure proper diffusion of chlorine throughout the well. The following method is suggested:

Place the granulated calcium hypochlorite in a short section of pipe capped at both ends. A number of small holes should be drilled through each cap or into the sides of the pipe. One (1) of the caps should be fitted with an eye to facilitate attachment of a suitable cable. The disinfecting agent is distributed when the pipe section is lowered and raised throughout the depth of the water.

WATER-BEARING STRATA

Sometimes a well is encountered that does not respond to the usual methods of disinfection. A well like this has usually been contaminated by water that entered under sufficient head to displace water into the water-bearing formation. The displaced water carries contamination with it. The contamination that has been carried into the water-bearing formation can be eliminated or reduced by forcing chlorine into the formation. Chlorine may be introduced in a number of ways, depending on the construction of the well. In some wells, it is advisable to chlorinate the water and then add a considerable volume of a chlorine solution in order to force the treated water into the formation. When this procedure is followed, all chlorinated water should have a chlorine strength of approximately 50 mg/L. In other wells, such as the drilled well cased with standard weight casing pipe, it is entirely practicable to chlorinate the water, cap the well and apply a head of air. When air is alternately applied and released, a vigorous surging effect is obtained and chlorinated water is forced into the water bearing formation. In this procedure, the chlorine strength of the treated water, in the well, will be reduced by dilution as it mixes with the water in the water-bearing formation. Therefore, it is advisable to double or triple the quantity of chlorine compound to be used so as to have a chlorine strength of 100 to 150 mg/L in the well as the surging process is started. After treating a well in this manner, it is necessary to flush it to remove the excess chlorine.

DISINFECTION OF SPRINGS

Springs and encasements should be disinfected by a procedure similar to that used for dug well. If the water pressure is not sufficient to raise the water to the top of the encasement, it may be possible to shut off the flow and thus keep the disinfectant in the encasement for twenty-four (24) hours. If the flow cannot be shut off entirely, arrangements should be made to supply disinfectant continuously for as long a period as practicable.

DISINFECTION OF WATER DISTRIBUTION SYSTEMS

These instructions cover the disinfection of water distribution systems and attendant standpipes or tanks. It is always necessary to disinfect a water system before placing it in use under the following conditions:

1. Disinfection of a system that has been in service with raw or polluted water, preparatory to transferring the service to treated water.
2. Disinfection of a new system upon completion and preparatory to placing in operation with treated water or water of satisfactory quality.
3. Disinfection of a system after completion of maintenance and repair operations.

The entire system, including tank or standpipe, should be thoroughly flushed with water to remove any sediment that may have collected during operation with raw water. Following flushing, the system should be filled with a disinfecting solution of calcium hypochlorite and treated water. This solution is prepared by adding 550 grams (1.2 pounds) of high-test 70% calcium hypochlorite to each 3,785 liters (1,000 gallons) of water. A mixture of this kind provides a solution having not less than 100 mg/L of available chlorine.

The disinfectant should be retained in the system, tank or standpipe, if included, for not less than twenty-four (24) hours, then examined for residual chlorine and drained out. If no residual chlorine is found present, the process should be repeated. The system is next flushed with treated water and put into operation.

IV. CONTINUOUS WATER DISINFECTION

Water supplies which are otherwise deemed satisfactory, but which prove unable to meet the bacteriological standards prescribed herein, shall be subjected to continuous disinfection. The individual character of the supply shall be investigated and a treatment program developed, which shall produce a safe supply as determined by bacteriological testing.

For numerous reasons, including economy, effectiveness, stability, ease of use and availability, chlorine is by far the most popular chemical agent employed for the disinfection of water supplies. This does not preclude the use of other chemicals or procedures demonstrated to be safe and effective. The amount necessary to provide adequate protection varies with the supply and the amount of organic and other oxidizable material that it contains. Proper disinfection can only be assured when a residual concentration of chlorine remains, for bactericidal activity, after the demands of these other substances are met. In general, these factors exert the most important influences on the bactericidal efficiency of chlorine:

1. Free chlorine residual; the higher the residual, the more effective the disinfection and the faster the disinfection rate.
2. Contact time between the organism and the disinfectant; the longer the time, the more effective the disinfection.
3. Temperature of the water in which contact is made; the lower the temperature, the less effective the disinfection.
4. The pH of the water in which contact is made; the higher the pH, the less effective disinfection.

For example, when a high pH and low temperature combination is encountered in a water, either the concentration of chlorine or the contact time must be increased. Likewise, chlorine residual will need to be increased if sufficient contact time is not available in the distribution system before the water reaches the first user.

SUPERCHLORINATION - DECHLORINATION

Superchlorination: The technique of superchlorination involves the use of an excessive amount of chlorine to destroy quickly the harmful organisms that may be present in the water. If an excessive amount of chlorine is used, free chlorine residual will be present. When the quantity of chlorine is increased, disinfection is faster and the amount of contact time required insuring safe water is decreased.

De-chlorination: The de-chlorination process may be described as the partial or complete reduction of any chlorine present in the water. When de-chlorination is provided in conjunction with proper superchlorination, the water will be both properly disinfected and acceptable to the consumer for domestic or culinary uses.

De-chlorination can be accomplished in individual water systems by the use of activated carbon, de-chlorinating filters. Chemical de-chlorination by reducing agents such as sulphur dioxide or sodium thiosulfate can be used for batch de-chlorination. Sodium thiosulfate is also used to de-chlorinate water samples prior to submission for bacteriological examination.

DISINFECTION EQUIPMENT

Hypochlorinators are the most commonly employed equipment for the chemical elimination of bacteriological contamination. They operate by pumping or injecting a chlorine solution into the water. When properly maintained, hypo-chlorinators provide a reliable method for applying chlorine to disinfect water.

Types of hypo-chlorinators include positive displacement feeders, aspirator feeders, suction feeders and tablet hypo-chlorinators.

This equipment can be readily adapted to meet the needs of other systems of treatment, which require the regulated discharge of a solution into the supply.

Positive Displacement Feeders: A common type of positive displacement hypo-chlorinator is one (1) that uses a piston or diaphragm pump to inject the solution. This type of equipment, which is adjustable during operation, can be designed to give reliable and accurate feed rates. When electricity is available, the stopping and starting of the hypo-chlorinator can be synchronized with the pumping unit. A hypo-chlorinator of this kind can be used with any water system. However, it is especially desirable in systems where water pressure is low and fluctuating.

Aspirator Feeders: The aspirator feeder operates on a simple hydraulic principle that employs the use of the vacuum created when water flows either through a venturi tube or perpendicular to a nozzle. The vacuum created, draws the chlorine solution from a container into the chlorinator unit where it is mixed with water passing through the unit and the solution is then injected into the water system. In most cases, the water inlet line to the chlorinator is connected to receive water from the discharge side of the water pump, with the chlorine solution being injected back into the suction side of the same pump. The chlorinator operates only when the pump is operating. Solution flow rate is regulated by means of a control valve; pressure variations are known to cause changes in the feed rate.

Suction Feeders: One (1) type of suction feeder consists of a single line that runs from the chlorine solution container, through the chlorinator unit and connects to the suction side of the pump. The chlorine solution is pulled from the container by suction created by the operating water pump.

Another type of suction feeder operates on the siphon principle, with the chlorine solution being introduced directly into the well. This type also consists of a single line, but the line terminates in the well below the water surface instead of the influent side of the water pump. When the pump is operating, the chlorinator is activated so that a valve is opened and the chlorine solution is passed into the well.

Tablet Chlorinator: These hypo-chlorinators inject water into a bed of concentrated calcium hypochlorite tablets. The result is metered into the pump suction line.

V. WATER RECLAIMED FROM MILK AND MILK PRODUCTS

Water reclaimed from milk and milk products may be reused in a milk plant. The three (3) general categories for reclaimed water use are:

1. Reclaimed water, which may be used for all potable water purposes, including the production of culinary steam.
2. Reclaimed water, which may be used for limited purposes, including the production of culinary steam.

3. Use of reclaimed water not meeting the requirements of this Section.

CATEGORY I. USED FOR POTABLE WATER PURPOSES

Reclaimed water to be used for potable water purposes, including the production of culinary steam, shall meet the following requirements:

1. Water shall comply with the Bacteriological Standards of Appendix G., and, in addition, shall not exceed a total plate count of 500 per milliliter (500/mL).
2. Samples shall be collected daily for two (2) weeks following initial approval of the installation and semi-annually thereafter. Provided, that daily tests shall be conducted for one (1) week following any repairs or alteration to the system.
3. The organic content shall be less than 12 mg/L as measured by the chemical oxygen demand or permanganate-consumed test; or a standard turbidity of less than five (5) units.
4. Automatic fail-safe monitoring devices shall be used to monitor and automatically divert, to the sewer, any water that exceeds the standard.
5. The water shall be of satisfactory organoleptic quality and shall have no off-flavors, odors or slime formations.
6. The water shall be sampled and tested organoleptically at weekly intervals.
7. Approved chemicals, such as chlorine, with a suitable detention period, may be used to suppress the development of bacterial growth and prevent the development of tastes and odors.
8. The addition of chemicals shall be by an automatic proportioning device, prior to the water entering the storage tank, to assure satisfactory quality water in the storage tank at all times.
9. When chemicals are added, a daily testing program for such added chemicals shall be in effect and such chemicals shall not add substances that will prove deleterious to the use of the water or contribute to product contamination.
10. The storage vessel shall be properly constructed of such material that it will not contaminate the water and can be satisfactorily cleaned.
11. The distribution system, within a milk plant, for such reclaimed water shall be a separate system with no cross-connections to a municipal or private water system.
12. All physical, chemical and microbiological tests shall be conducted in accordance with the latest edition of SMEW.

CATEGORY II. USED FOR LIMITED PURPOSES

Reclaimed water may be used for limited purposes including:

1. Production of culinary steam.
2. Pre-rinsing of the product surfaces where pre-rinses will not be used in milk or milk products.
3. Cleaning solution make-up water.

Provided that for these uses, Items 3-11 of Category I are satisfied and:

1. There is no carry-over of water from one (1) day to the next, and any water collected is used promptly; or

- a. The temperature of all water in the storage and distribution system is maintained at 63°C (145°F) or higher by automatic means; or
 - b. The water is treated with a suitable, approved chemical to suppress bacterial propagation by means of an automatic proportioning device, prior to the water entering the storage tank; and that,
2. Distribution lines and hose stations are clearly identified as "limited use reclaimed water"; and
 3. Water handling practices and guidelines are clearly described and prominently displayed at appropriate locations within the milk plant; and
 4. These water lines are not permanently connected to product vessels, without a break to the atmosphere and sufficient automatic controls, to prevent the inadvertent addition of this water to product streams.

CATEGORY III. USE OF RECLAIMED WATER NOT MEETING THE REQUIREMENTS OF THIS SECTION

Reclaimed water not meeting the requirements of this Section may be used as feed-water for boilers, not used for generating culinary steam, or in a thick, double walled, enclosed heat exchanger.

VI. WATER RECLAIMED FROM HEAT EXCHANGER PROCESSES

Potable water utilized for heat exchange purposes in plate or other type heat exchangers or compressors on Grade "A" dairy farms may be salvaged for the milking operation if the following criteria are met:

1. The water shall be stored in a storage vessel properly constructed of such material that it will not contaminate the water and be designed to protect the water supply from possible contamination.
2. The storage vessel shall be equipped with a drain and access point to allow for cleaning.
3. No cross-connection shall exist between this supply and any unsafe or questionable water supply or any other source of pollution.
4. There are no submerged inlets through which this supply may be contaminated.
5. The water shall be of satisfactory organoleptic quality and shall have no off-flavors or odors.
6. The water shall comply with the Bacteriological Standards of Appendix G.
7. Samples shall be collected and analyzed prior to initial approval and semi-annually thereafter.
8. Approved chemicals, such as chlorine, with a suitable retention period, may be used to suppress the development of bacterial growth and prevent the development of tastes and odors.
9. When chemicals are added, a monitoring program for such added chemicals shall be in effect and such chemicals shall not add substances that will prove deleterious to the use of the water or contribute to product contamination.
10. If the water is to be used for the sanitizing of teats or equipment, backflush systems, approved sanitizers, such as iodine, may be added by an automatic proportioning device, located downstream from the storage vessel but prior to its end-use application.

NOTE: Water from the current milking, obtained directly from the discharge of a raw milk heat exchanger, may be utilized for the one (1) time, pre-rinsing of dairy equipment or for non-potable uses. This heat exchange water may be used if:

1. The water is used for the one (1) time pre-rinsing of milking equipment, including milk lines, milking claw assembly, milk receiver, etc., and discharged to waste.
2. The water is collected directly from the plate heat exchanger into the wash vat or utensil sink.
3. The water piping system shall meet the requirements of Item 8r of this Ordinance.

VII. DRAWINGS OF CONSTRUCTION DETAILS FOR WATER SOURCES

NOTE: The following Figures 8-25 are taken from The Manual of Individual Water Supply Systems EPA publication number EPA-430-9-73-003.

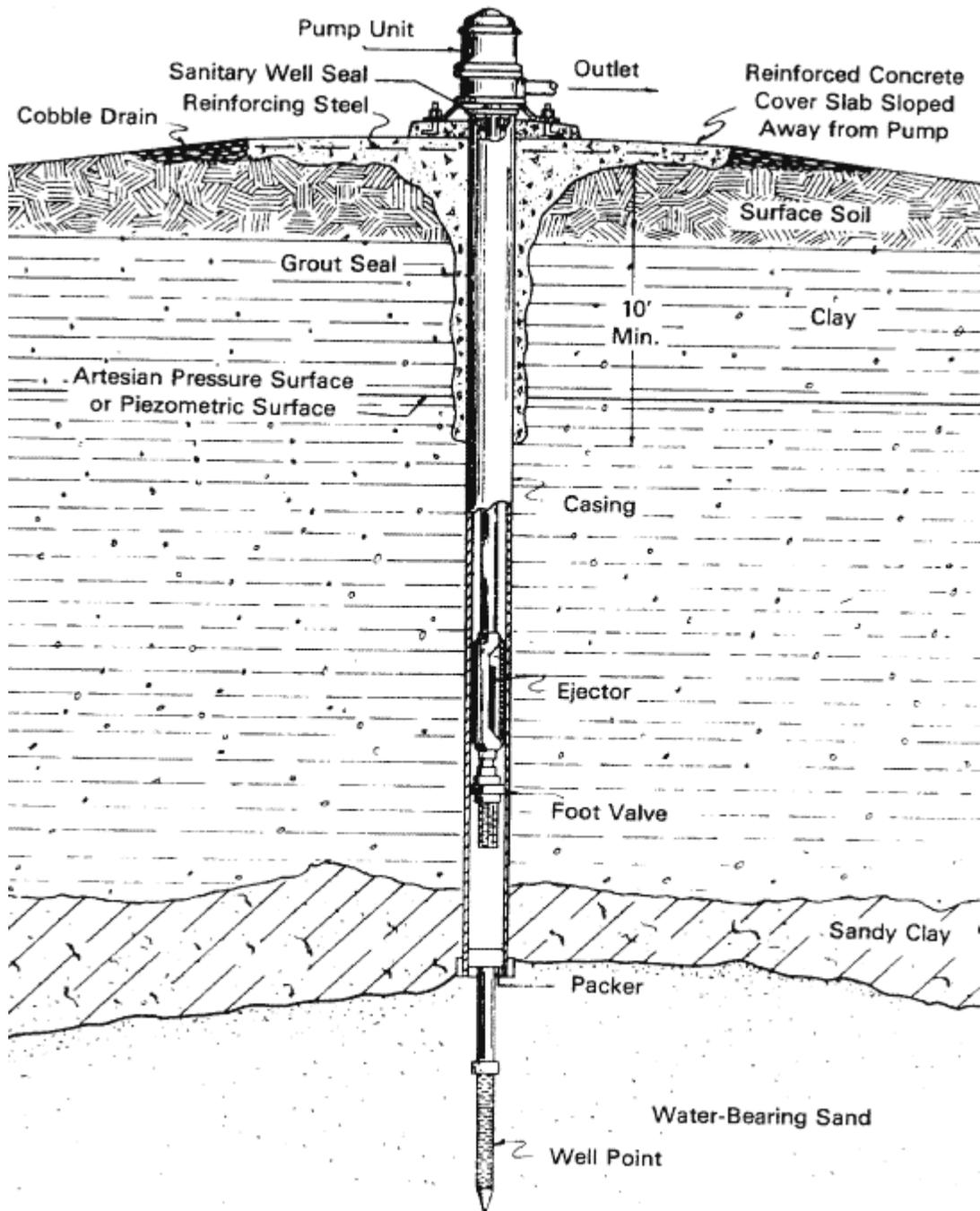


Figure 8. Bored Well with Driven Well Point

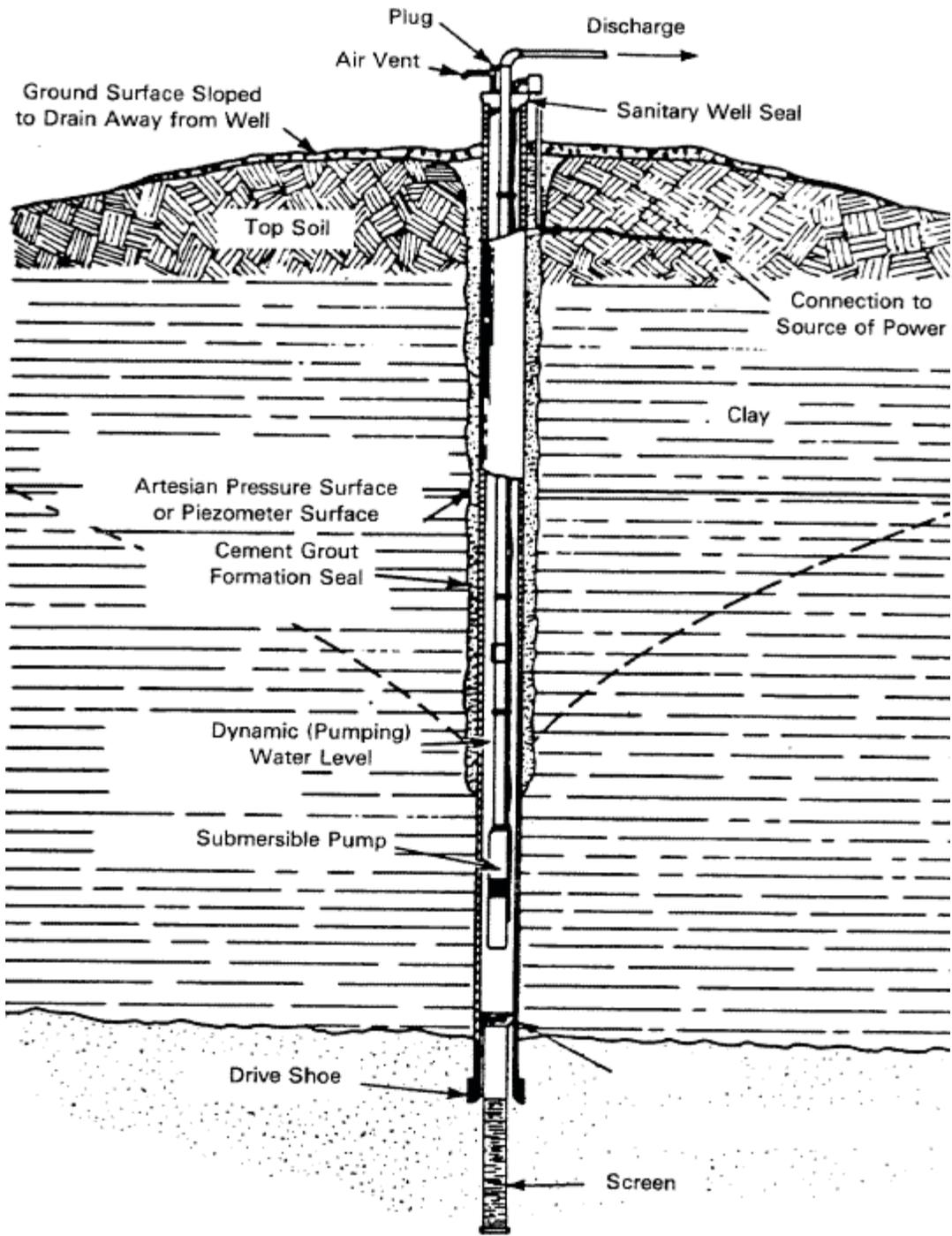


Figure 9. Drilled Well with Submersible Pump

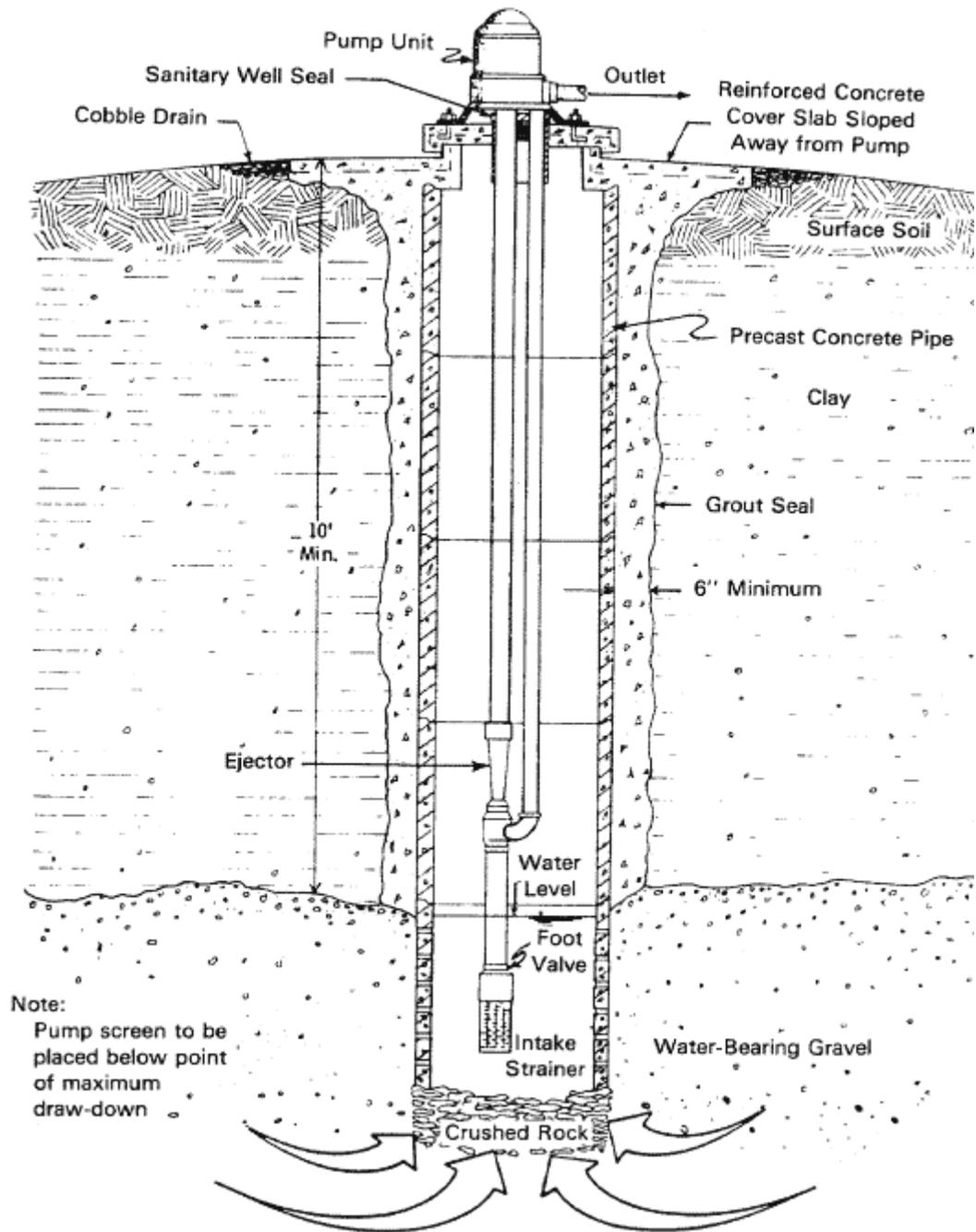


Figure 10. Dug Well with Two-Pipe Jet Pump Installation

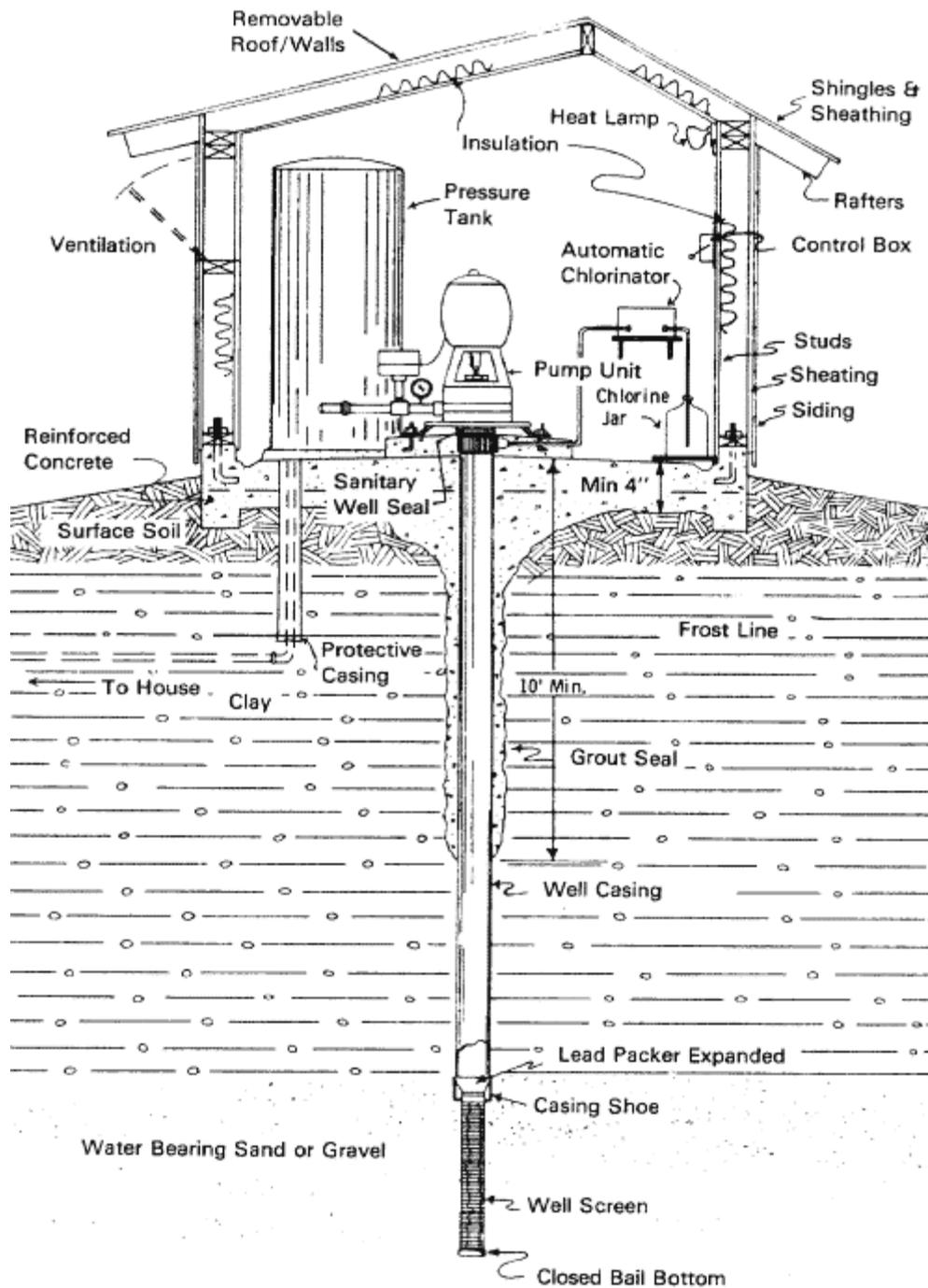


Figure 11. Pumphouse

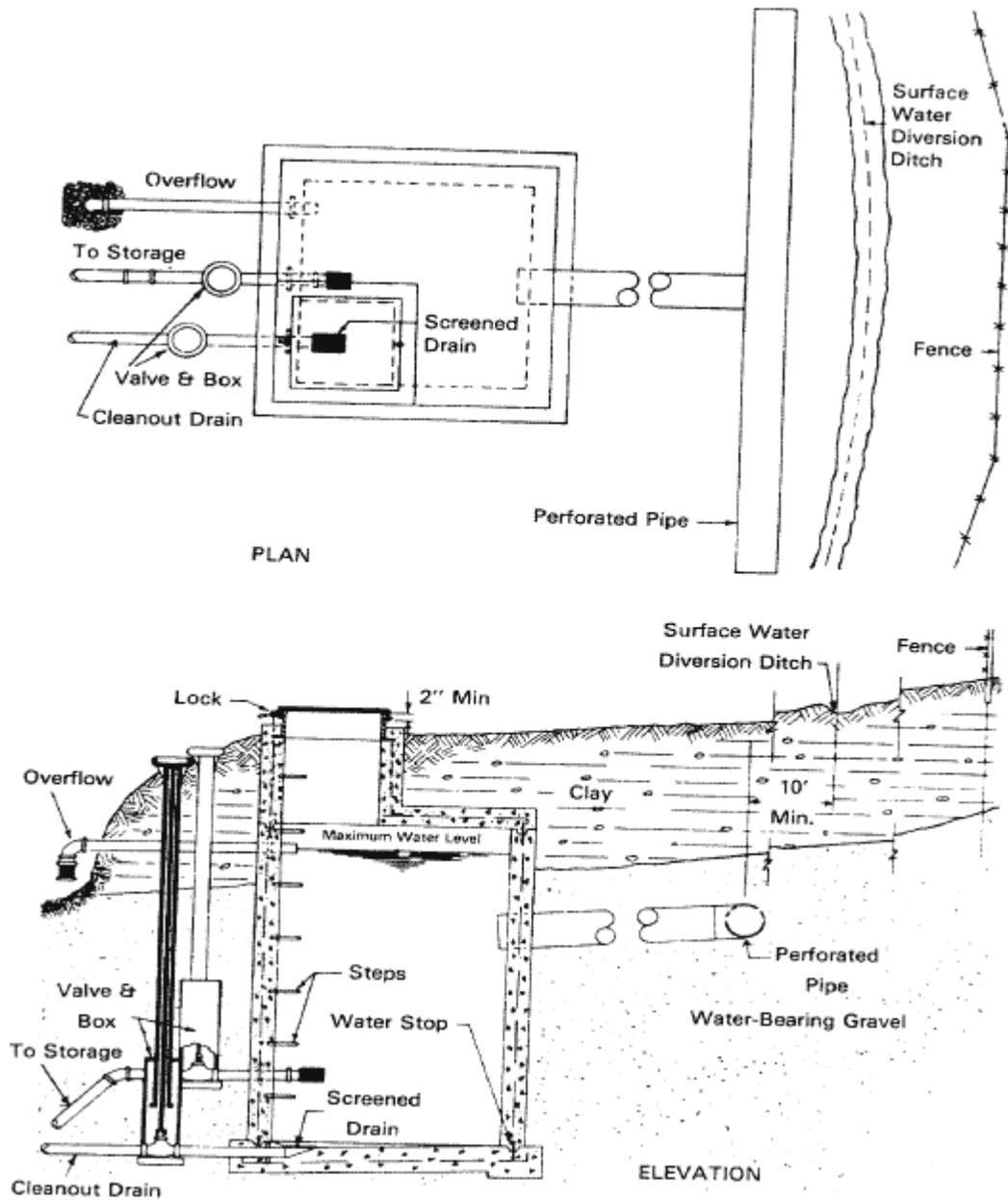


Figure 12. Spring Protection

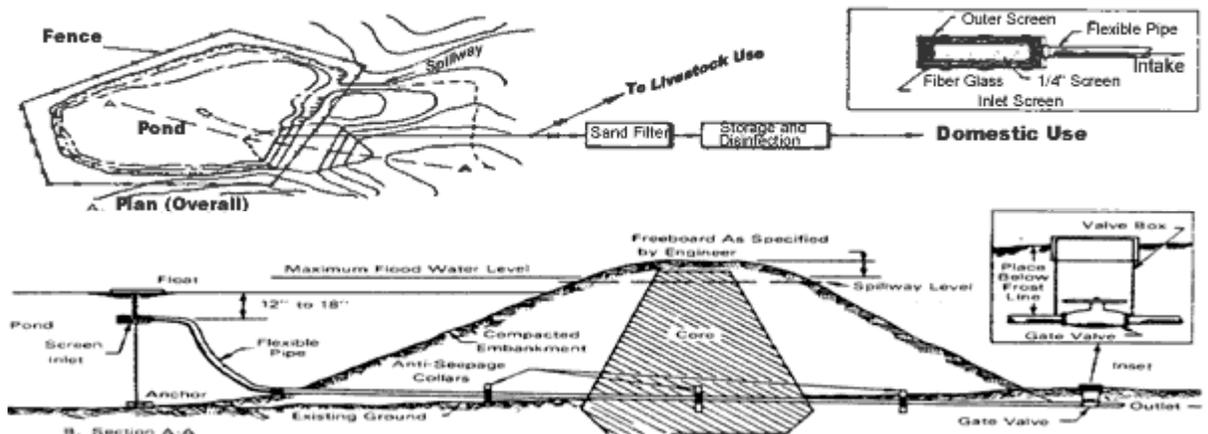


Figure 13. Pond

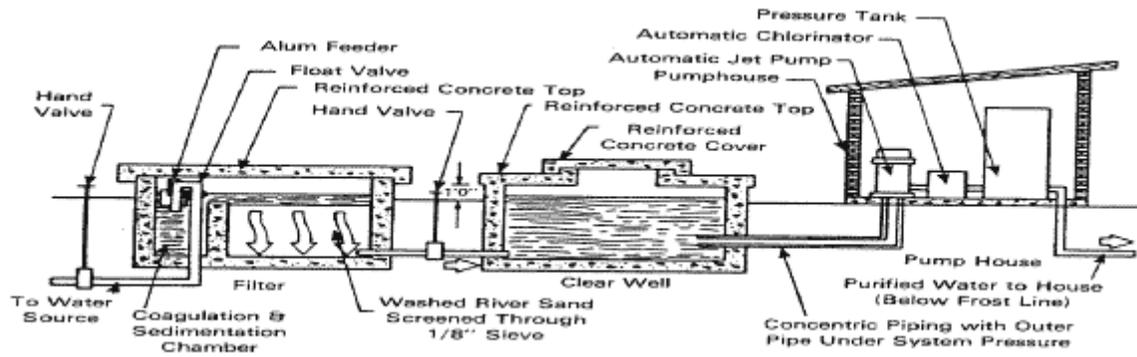


Figure 14. Schematic Diagram of a Pond Water-Treatment System

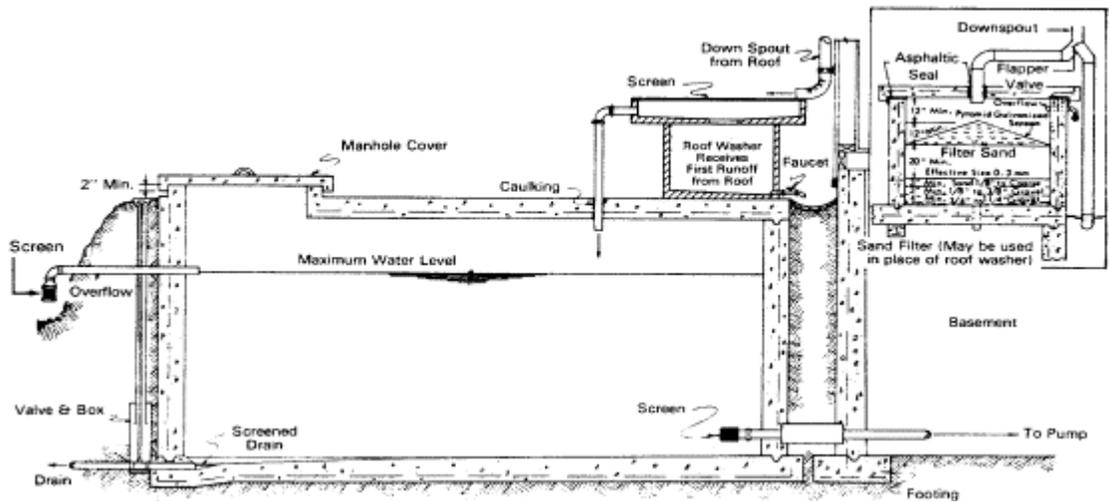


Figure 15. Cistern

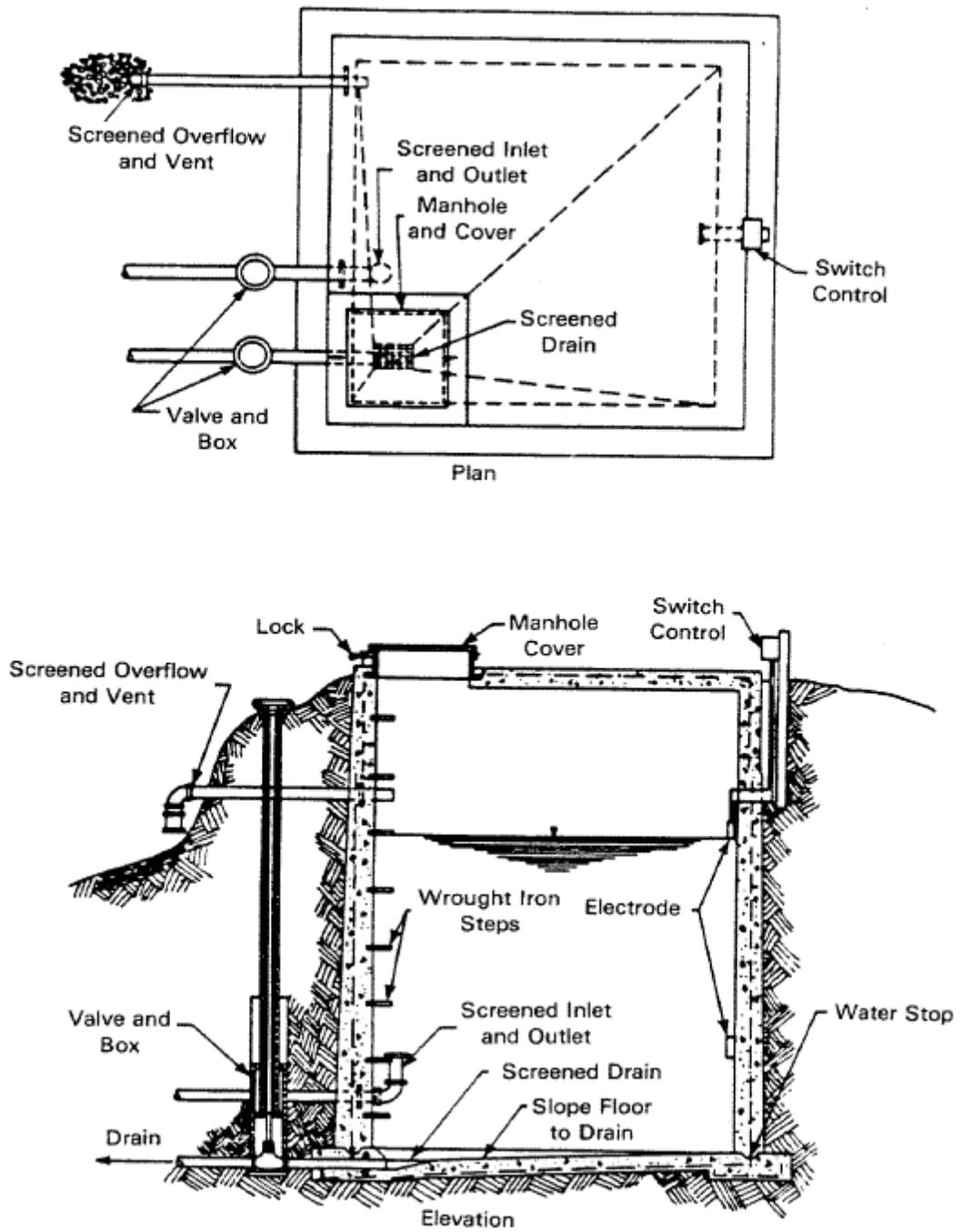


Figure 16. Typical Concrete Reservoir

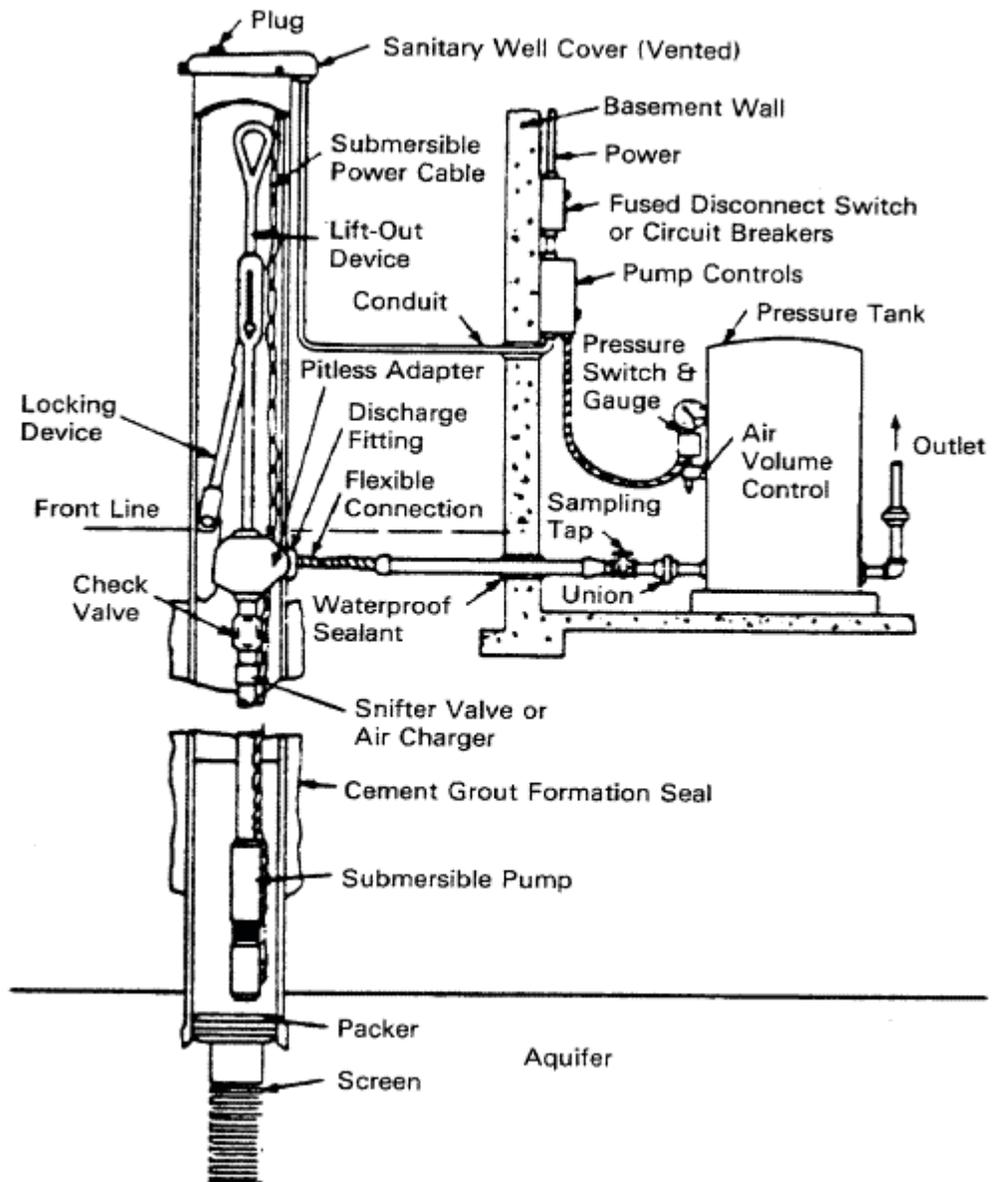


Figure 17. Pit-less Adapter with Submersible Pump Installation for Basement Storage

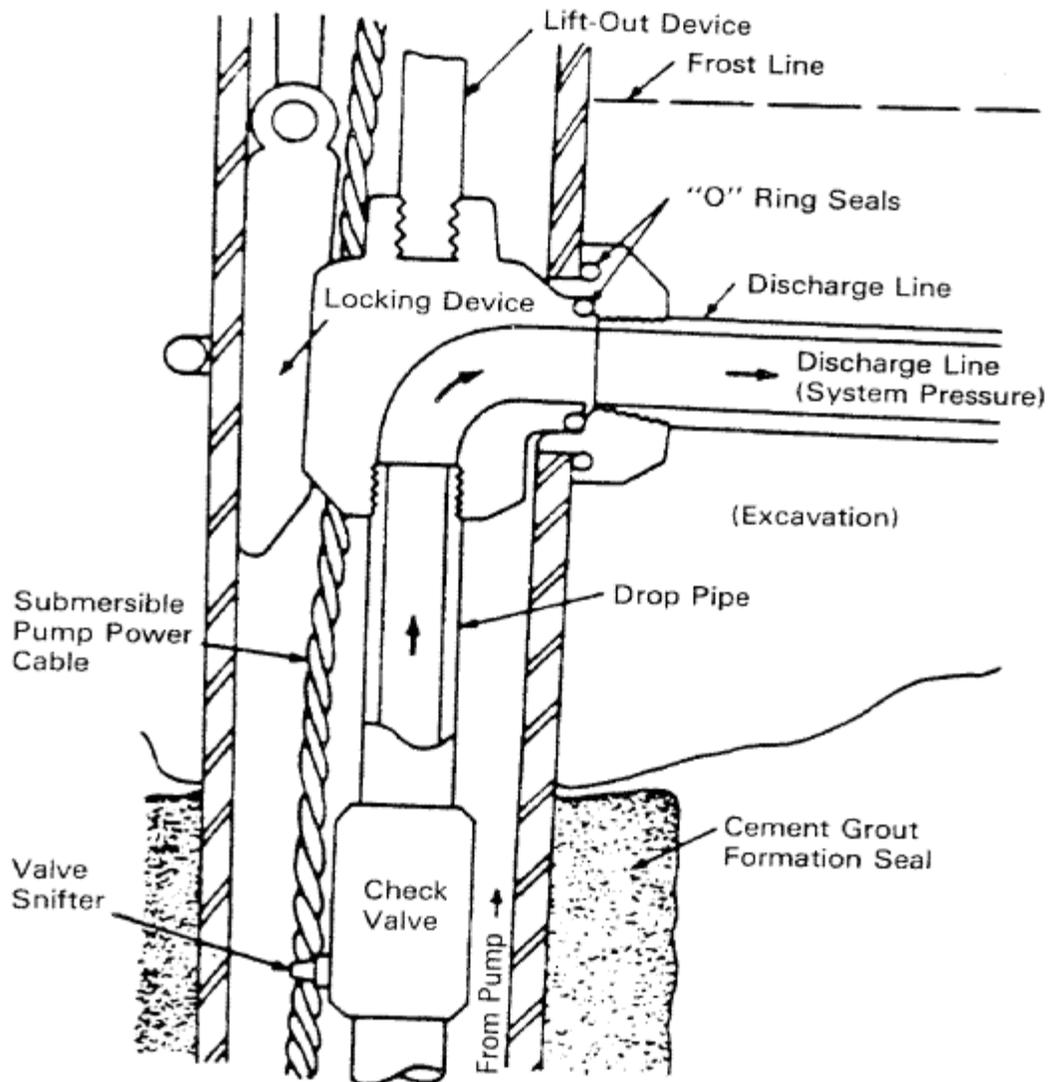


Figure 18. Clamp-on Pit-less Adapter with Concentric External Piping for "Shallow Well" Pump Installation

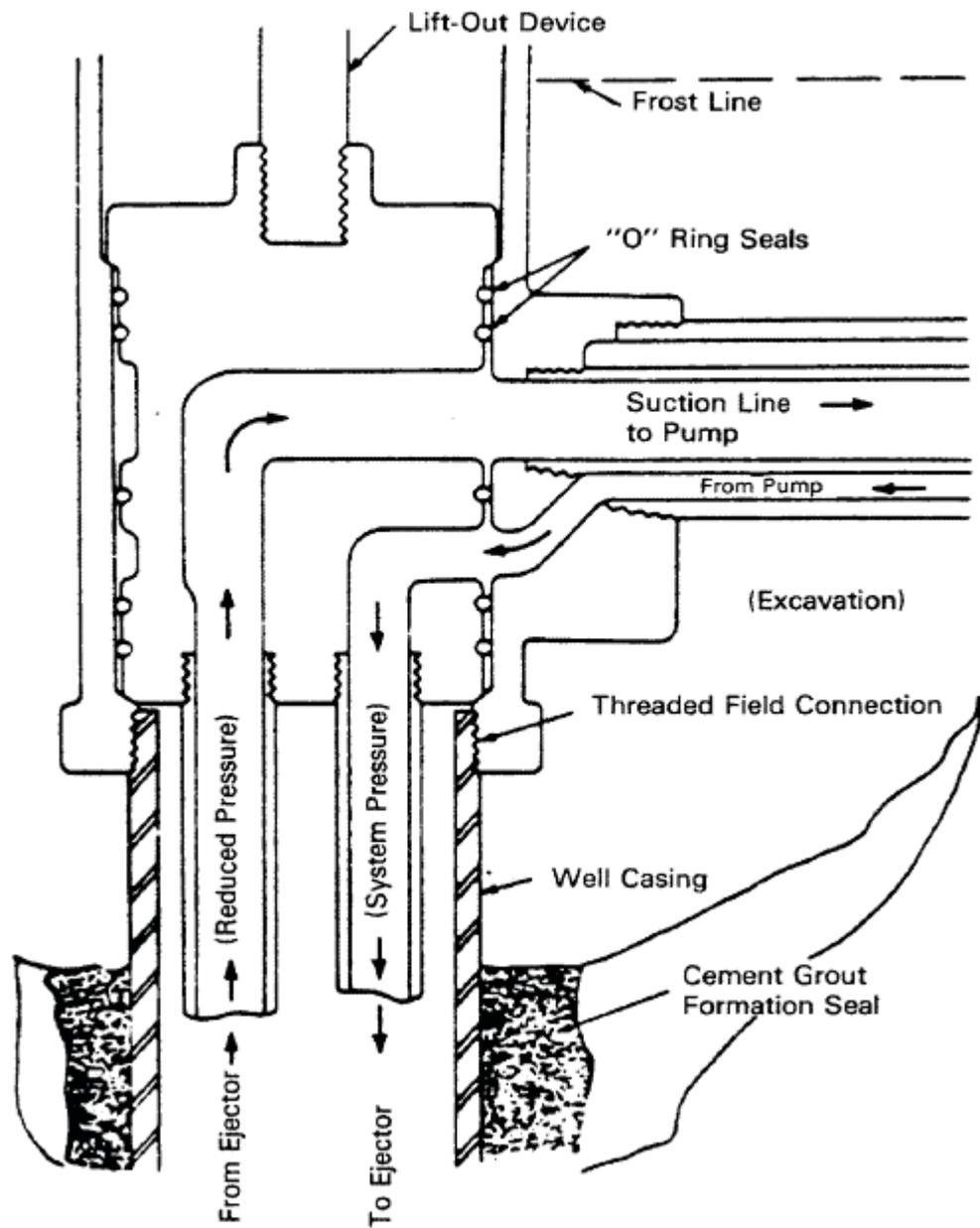


Figure 19. Pit-less Unit with Concentric External Piping for Jet Pump Installation

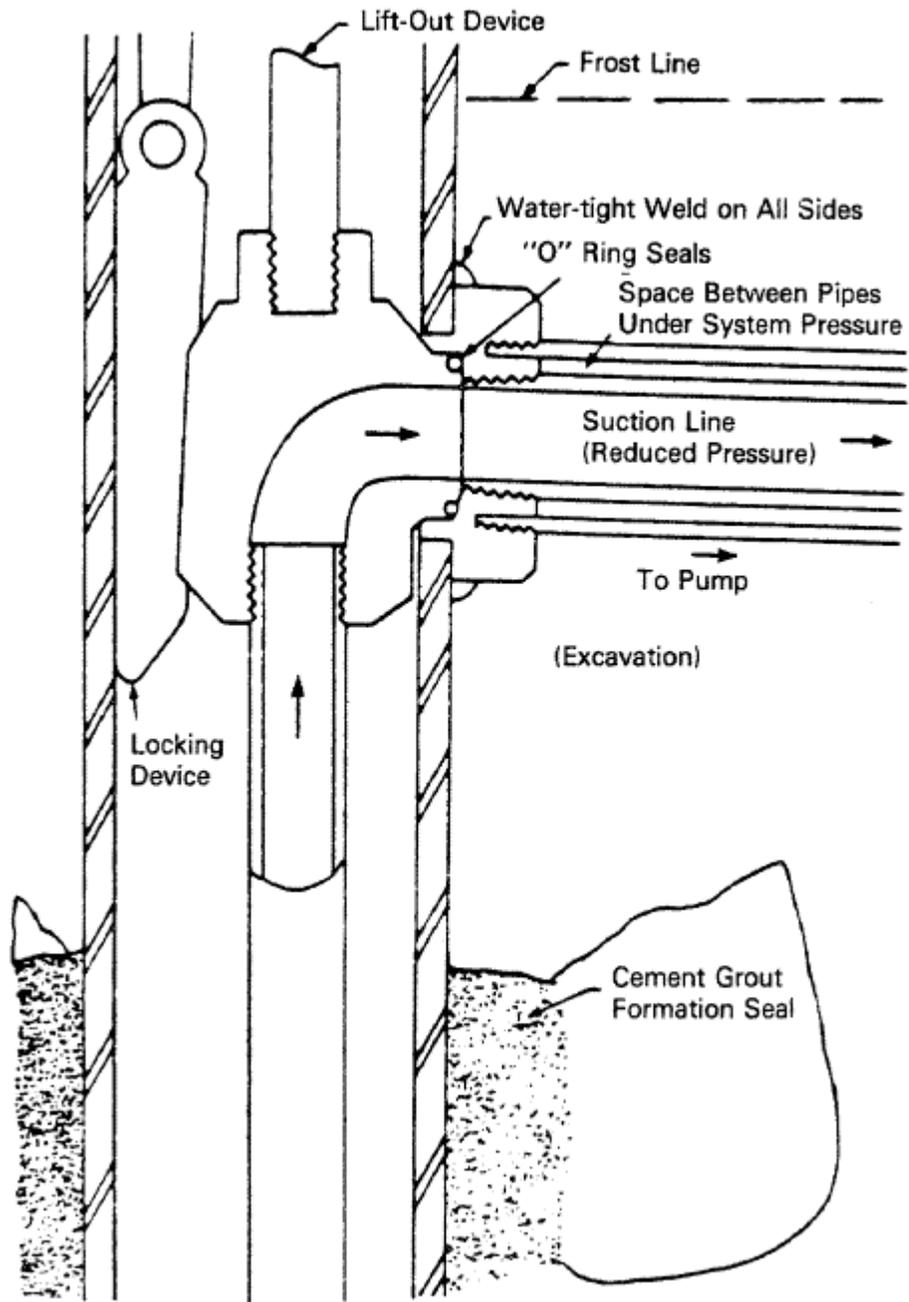


Figure 20. Weld-on Pit-less Adapter with Concentric External Piping for "Shallow Well" Pump Installation

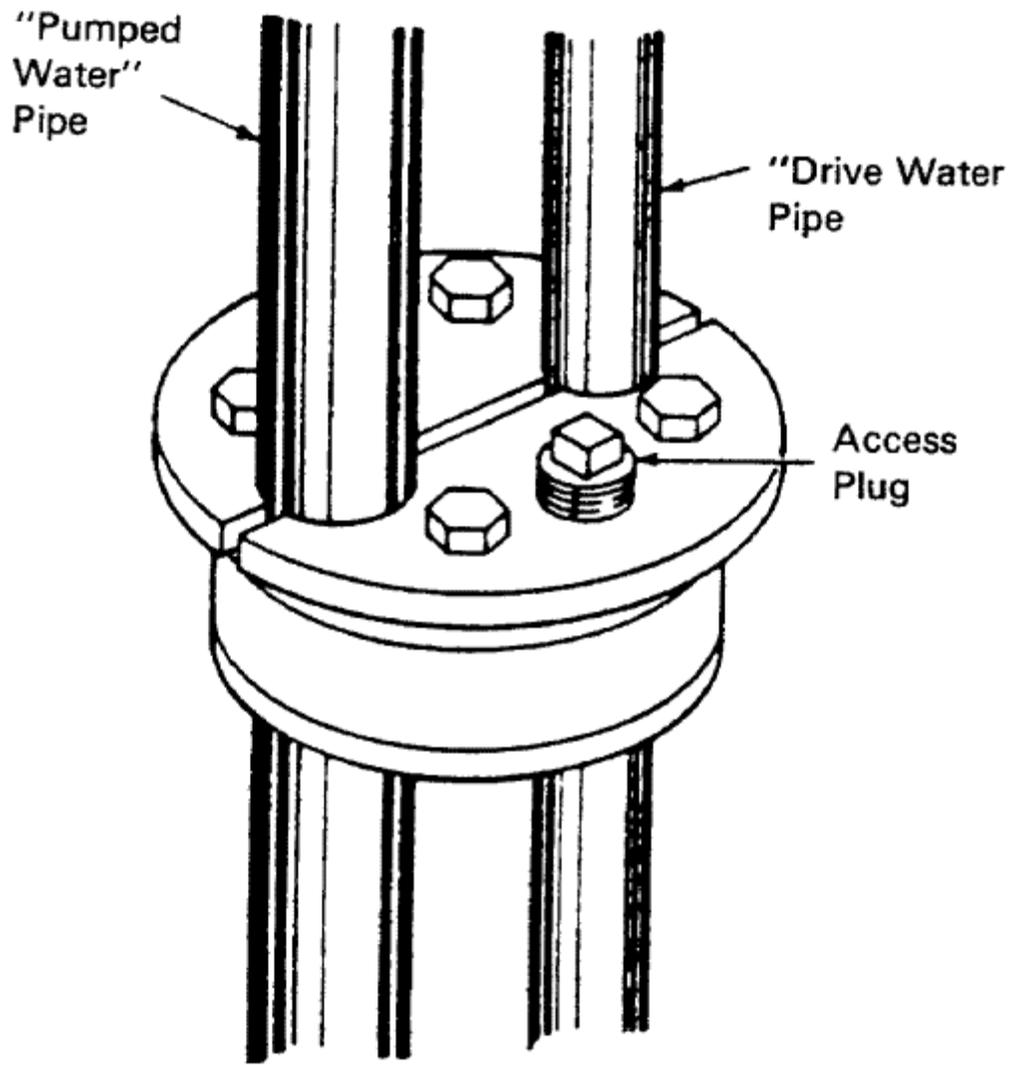


Figure 21. Well Seal for Jet Pump Installation

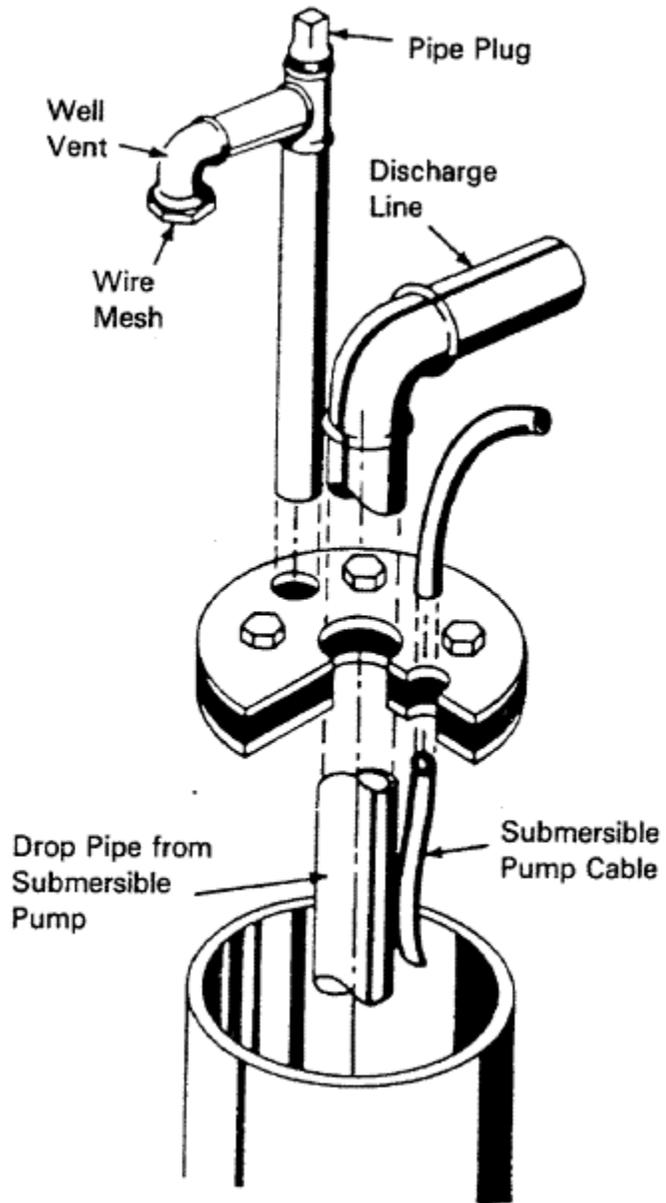
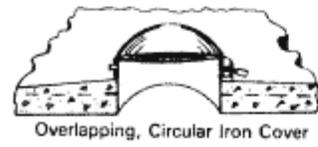
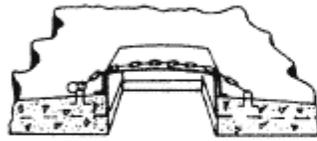


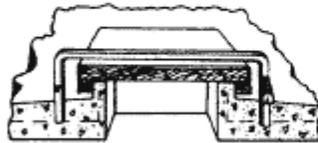
Figure 22. Well Seal for Submersible Pump Installation



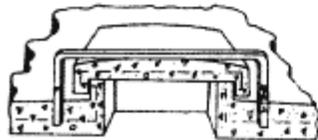
Overlapping, Circular Iron Cover



Iron Cover

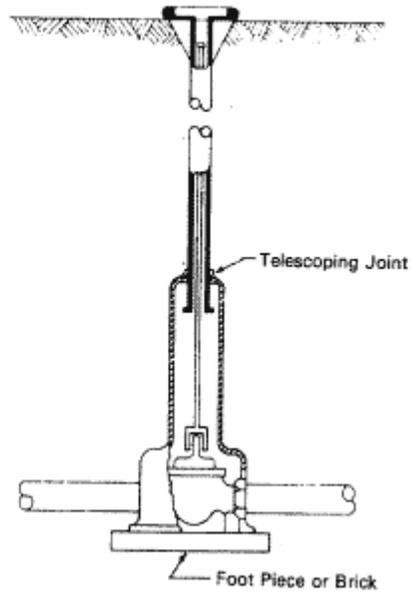


Galvanized Sheet Metal
Over Wooden Cover



Concrete Cover

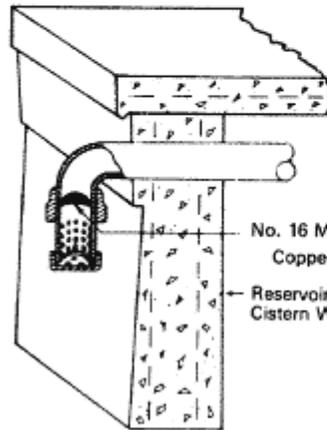
MANHOLD COVERS



Telescoping Joint

Foot Piece or Brick

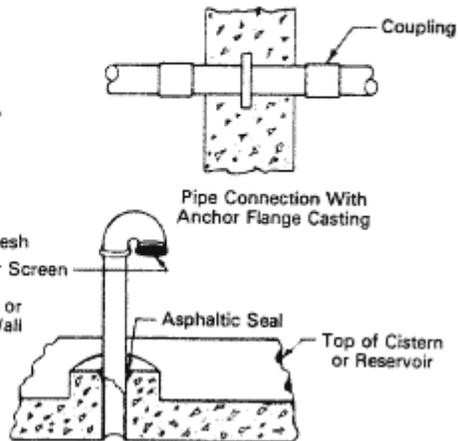
TYPICAL VALVE AND BOX



No. 16 Mesh
Copper Screen

Reservoir or
Cistern Wall

OVERFLOW AND VENT



Coupling

Pipe Connection With
Anchor Flange Casting

Asphaltic Seal
Top of Cistern
or Reservoir

VENT

Figure 23. Typical Valve and Box, Manhole Covers, and Piping Installation

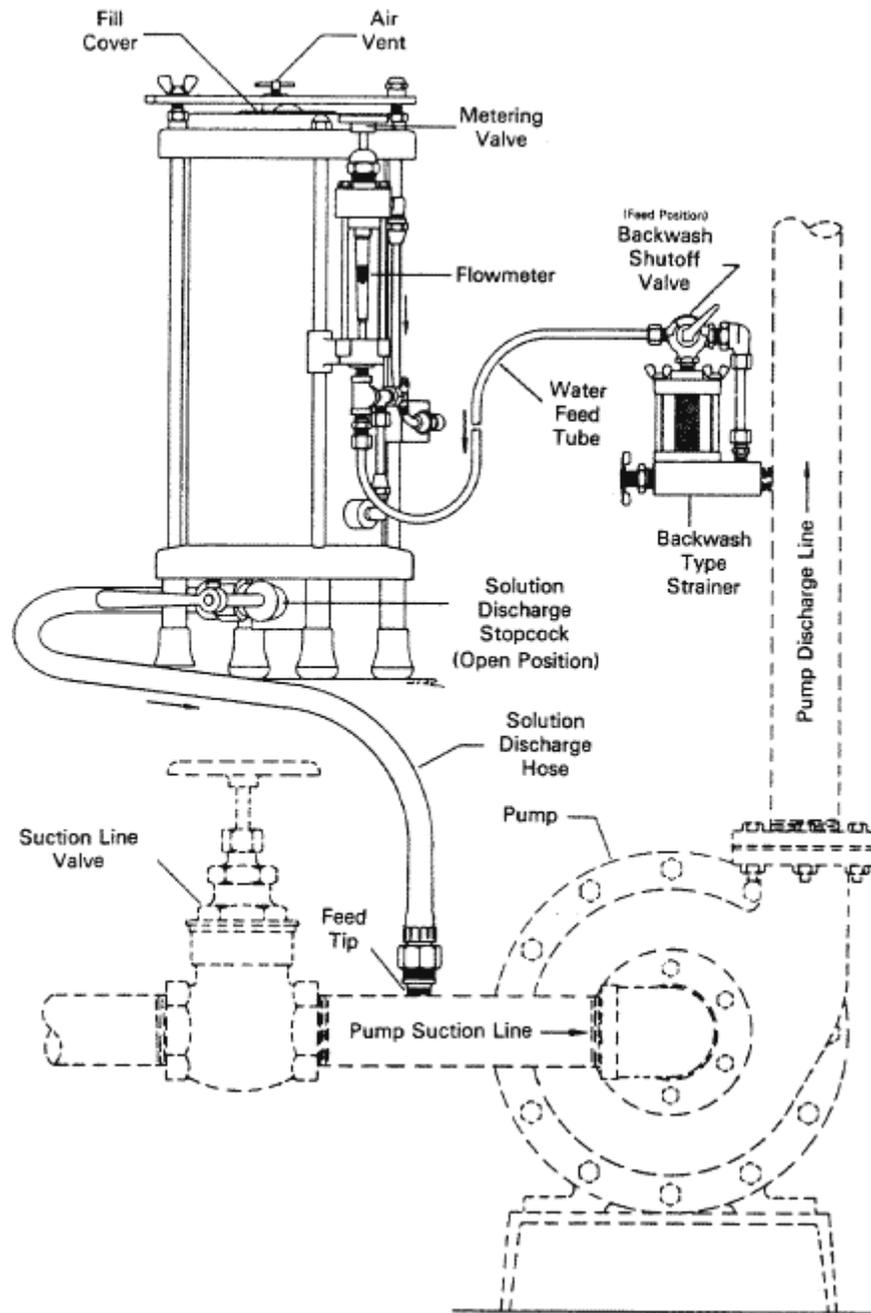


Figure 24. Suction Feeder

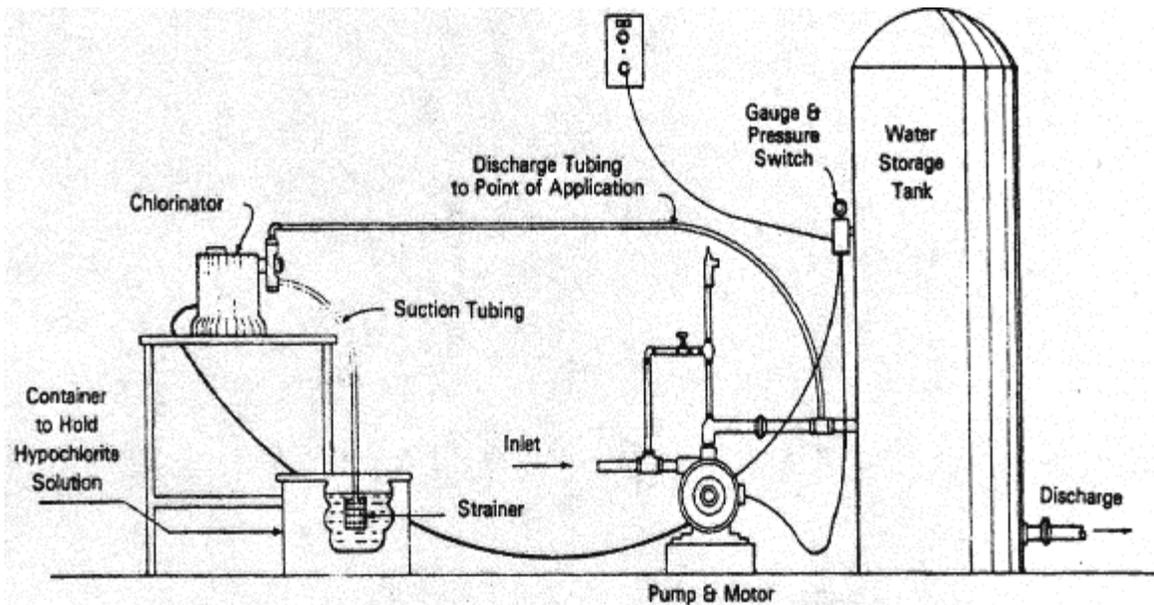


Figure 25. Positive Displacement Chlorinator

FOOTNOTE:

In the interest of clarity and to provide easy access to the information, all numbered footnotes have been removed from the body of this publication and are assembled in this section. A numerical reference in the text will always relate to its like-numbered footnote in this section.

Substitute proper legal jurisdiction here and in all similar places throughout the Ordinance.