BEAUFORT JASPER WATER AND SEWER AUTHORITY

GREASE TRAP AND GREASE INTERCEPTOR STANDARDS

BJWSA
BEAUFORT – JASPER
WATER & SEWER
AUTHORITY

AUGUST 2011

INDEX

Approval:_____

Director of Field Operations

Date:_____

I. PREFACE

It is the intent of this BJWSA Grease Trap Standard to provide for specific standards for trap location, design, installation, construction, operation and maintenance of new grease interceptors so as to comply with applicable regulatory standards. It should be noted that failure to comply with this Standard shall be considered violations of applicable sections of the existing BJWSA Sewer Use Ordinance, subject to applicable penalties and/or denial or discontinuance of water and/or sewer service.

All interceptors or traps shall be of a type and capacity approved by BJWSA and shall be located so as to be readily and easily accessible for cleaning and inspection. All interceptors shall be supplied and properly maintained continuously in satisfactory and effective operation by the owner at the owner's expense.

II. DEFINITIONS

All definitions shall be as currently supplied in the existing BJWSA Sewer Use Ordinance, with the following additions:

1. Food Service Establishment

   Any commercial facility discharging kitchen or food preparation (raw, pre-cooked or cooked) wastewaters including restaurants, motels, hotels, cafeterias, hospitals, schools, bars, fish markets, coffee shops, super markets, etc. and any other facility which, in BJWSA's opinion, would require a grease trap installation by virtue of its operation. Such definition normally includes any establishment which is required to have a South Carolina Department of Health and Environmental Control (SC DHEC) food service license.

2. Grease Trap/Grease Interceptor

   The device utilized to effect the separation of grease and oils in wastewater effluents from food service establishments. Such traps or interceptors may be of the "outdoor" or below ground type normally referred to as large grease interceptors, or the "under-the-counter" package units normally referred to as smaller grease traps that are located under or near the sink. These units may also be installed in the floor. However, for the purposes of this Standard the words "trap' and "interceptor" are generally used interchangeably.

3. Passive Grease Interceptors

   Passive grease interceptors retain wastewater long enough to allow for cool down of the greasy liquid, thus promoting coagulation and separation of the grease from the water. As the grease cools down, it floats to the top of the interceptor. The wastewater is then discharged into the public wastewater collection system.

III. ADMINISTRATIVE, GENERAL AND OPERATIONAL REQUIREMENTS

The following administrative, operational, and other general requirements are applicable to all food service establishments, new or existing.

1. All food service establishments are required to submit a Grease Trap/Interceptor Application to BJWSA (Attachment A). Plans, specifications, plumbing diagrams, riser diagrams, etc. are to be submitted with the application. BJWSA approval is required before construction or installation can proceed. An approval letter for each new trap will be issued by BJWSA prior to construction or installation. Likewise, the completed installation must be inspected and approved by BJWSA before a Certificate of Occupancy is granted.

2. All new and existing food service establishments are subject to periodic review, evaluation, and inspection by BJWSA representatives at any time.

3. Each food service establishment shall be inspected at a minimum of annually, or as determined necessary by a BJWSA representative. Results of each inspection will be made available to facility owners, with overall ratings and requirements for corrections/improvements. An inspection fee, per the BJWSA Ancillary Fee Policy, is charged per inspection per trap/interceptor.

4. Food service establishments whose operations cause or allow excessive grease or solids to discharge or accumulate in the sewer collection system are liable to BJWSA for all costs related to BJWSA for service calls due to line blockages, line cleaning, line and pump repairs, property damages, etc. This includes all labor, materials, equipment, and overhead. Failure to pay all service-related charges may also be grounds for water and/or sewer service discontinuance.

5. Any establishment whose effluent is suspected by BJWSA to contain a concentration of greater than 100 mg/L of oil and grease may be required to routinely sample their grease trap effluent, have it analyzed for oil and grease at the expense of the owner, and furnish a copy of the analysis to BJWSA. Oil and grease samples should be taken down stream of the grease interceptor. Additionally, BJWSA reserves the right to collect samples and bill the customer for incurred sampling costs.

6. All grease traps/interceptors shall be designed, installed and located in accordance with this Standard to allow for complete access to inspection, maintenance, etc.

7. All grease traps/interceptors must be installed by properly licensed plumbing contractors and inspected by a BJWSA representative during the installation process.

8. The construction and location criteria for grease interceptors shall be in accordance with the *Universal Plumbing Code for Grease Traps and Interceptors*. Typical construction detail drawings for acceptable grease traps are attached to this Standard (Attachment D).

9. Upon arrival of a BJWSA Inspector, it is the owner's responsibility to provide personnel to access and open the trap/interceptor for inspection and to close it upon completion of the inspection. Failure to open the trap/interceptor for inspection will result in an unsatisfactory inspection rating. A copy of the completed Grease Trap Inspection form (Attachment C) will be left with the owner.

10. Single below ground grease interceptors, and those installed in series, must be directly accessible from the surface. The minimum access opening dimensions shall be 18 inches x 18 inches or a minimum of 24 inches in diameter. Two (2) access openings (inlet and outlet) to below ground traps are required and should be removable with ease by one person. Concrete slabs, metal plates, and wedge tops are not considered easy access if the weight of the access is greater than 75 pounds. .

11. "Under-the-Counter" or "On the Floor"

- Approved flow controls to prevent overloading and allow for proper operation must be installed on the inlet.
- Must be located as close to the source of the grease generating fixture as physically possible, while remaining accessible for maintenance.

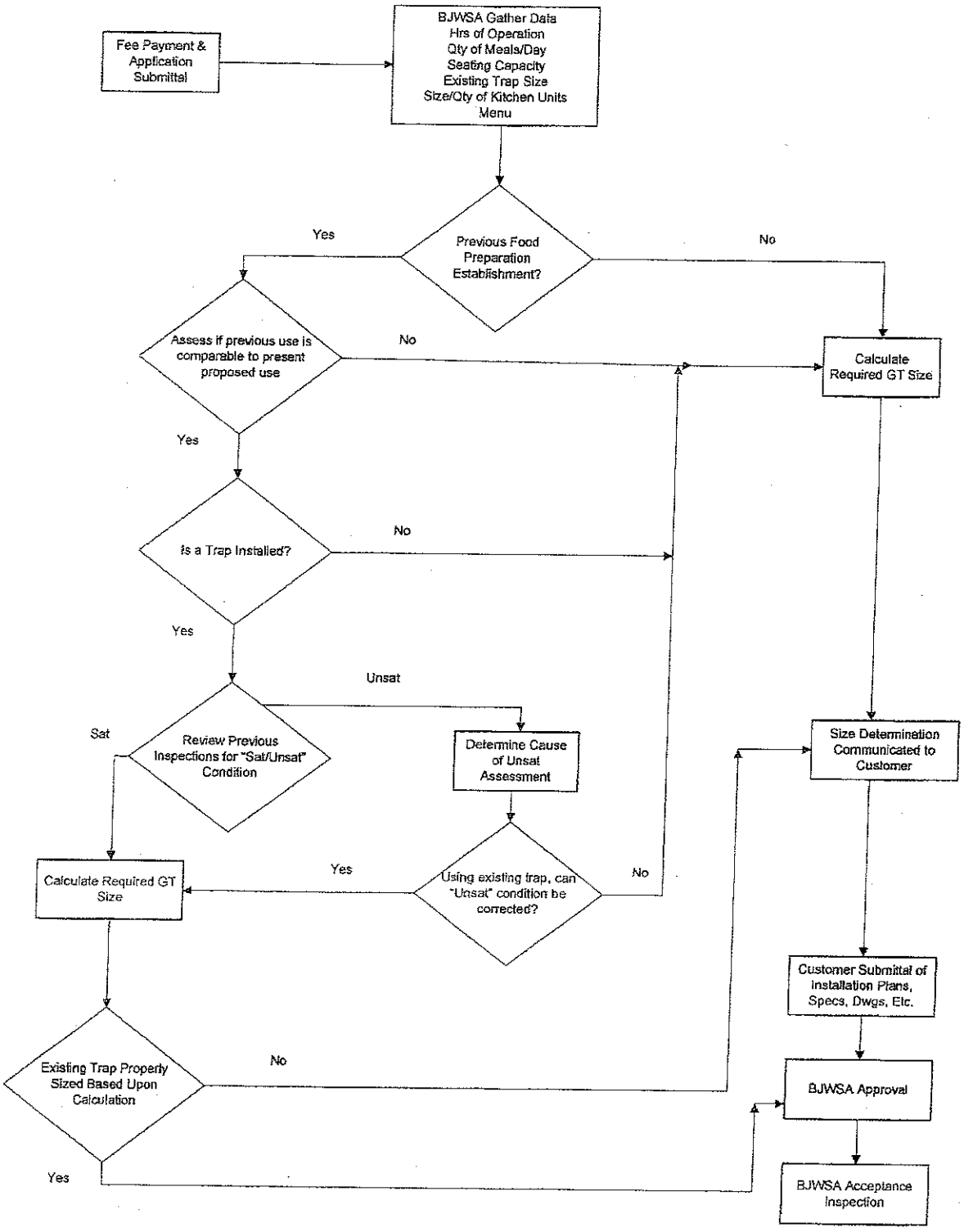
12. All traps/interceptors are to be installed with "grab sample" capability..

13. *Dishwashers, steamer units, other high temperature sources, and garbage grinders shall not be piped directly to "under-the-counter" or on the floor traps.*

14. Solids separation is required on all traps less than 500 gallons total volume.

15. Each establishment is required to have a trap/interceptor installation. Multiple establishments manifolded to a single trap/interceptor are not allowed.

IV. APPROVAL PROCESS



V. SIZE CALCULATION METHODS

A. Inground - Universal Plumbing Code

Size = M x WF x R x SF

M = Number of meals served at peak hour
WF = Waste flow rate
- 5 gallons: fully equipped commercial kitchen
- 2 gallons: single service kitchen

R = Retention time
- 1.5: for single service kitchen
- 2.5: for fully equipped commercial kitchen

SF = Storage capacity factor

Fully equipped commercial kitchen

8 hour operation:	1
16 hour operation:	2
24 hour operation:	3
Single service kitchen:	1.5

B. "Under the Counter" or "On the Floor" Trap/Interceptors – Sum of Flow Rates (Minimum 50 lbs)

Sizing of the "Under the Counter" or "On the Floor" traps/interceptors will be as follows. First, in terms of flow, the flow capacity of the trap must be at least equal to the total flow of the units discharging to the trap. This will also be the trap minimum volume. Second, the grease retention capacity, in pounds, before the trap's efficiency drops below 90%, will equal at least twice the sum of the fixture flow rates in GPM. Additionally, the maximum grease mat plus settled out solids is not to exceed 1/3 the volume of the trap. Both conditions must be met. **Minimum trap/interceptor accepted will be a 50-pound unit.**

Example

Condition 1:	Flow	
	Fixture 1:	20 GPM
	Fixture 2:	30 GPM
	Total Flow:	50 GPM
Required trap size (flow):		50 GPM
Required trap size (volume):		50 Gal

Condition 2: Grease Retention	
Minimum required grease retention (lbs):	100 lbs = 50 x 2
Minimum required grease retention (volume):	12.98 gal = 100 / 7.7 pounds per gal.
Maximum grease retention allowed (volume):	16.6 gal = 50 x 1/3
Maximum grease retention allowed (pounds):	127.8 lbs = 16.6 x 7.7

Additional Considerations for both methods:

A. Schools

The minimum grease trap size for all schools shall be 2000 gallons capacity.

B. Flow Control

Fluid flow through the grease interceptor is to be controlled by a flow restrictor. Actual flow (GPM) through the trap is to be restricted to 50% of the gross volume or initial flow of the grease trap. Size the restrictor per Table B8.8 (Attachment F).

Example	Volume	Flow
Grease trap size:	1000 gallons	50 GPM
Flow (GPM):	500 GPM = 50% x 1000 gallons	25 GPM
Per table B8.8, maximum pipe size = 4"		1 Inch

C. Solids Separator

The volume of the solids separator is to be 5% the volume of the grease trap.

Example

Grease trap size:	500 gallons
Solids separator size:	25 gallons = 5% x 500 gallons

Note: Not required when multiple interceptors are installed in series.

VI. MAINTENANCE

Trap maintenance is critical to proper separation of fats, oils and grease. Consequently, maintenance of grease traps/interceptors must include thorough pump-out and/or cleaning at a minimum frequency of four (4) times per year, or at a frequency determined by the BJWSA Inspector. The owner(s) shall be responsible for the proper removal and disposal by appropriate means of the captured material. After grease removal, the trap/interceptor should cleaned thoroughly. Each removal/cleaning must be recorded on a Maintenance Log (Attachment B) form for each trap/interceptor. Failure to maintain a log or perform the required number of cleanings is an unsatisfactory inspection rating. Any removal and hauling of the collected materials, not performed by the owner(s) personnel, must be performed by a currently licensed waste disposal firm. In addition, maintenance contracts may be required to be submitted to BJWSA's Collection Transmission/Compliance Department. Note, the owner is ultimately responsible for the proper maintenance of the grease trap facility(s).

Note: The grease mat plus settled out solids shall not exceed one-third (1/3) the normal fluid level depth of the trap. For example, if the fluid level depth is 48", the grease mat plus settled solids must not exceed 16" (48" x 1/3).

Maintenance logs must be posted in a conspicuous, visible, and easily accessible location for BJWSA review.

Grease-consuming bacteria may be considered for interim approval for grease trap maintenance, provided approval is obtained from BJWSA's Collection Transmission/Compliance Department and providing that this control method is considered effective and satisfactory to BJWSA's Inspector.

Exclusive use of bacteria, enzymes, or other grease solvents, emulsifiers, etc. (in lieu of physical cleaning), is not sufficient and is not approved for long-term grease trap maintenance, especially for non-biodegradable waste fractions.

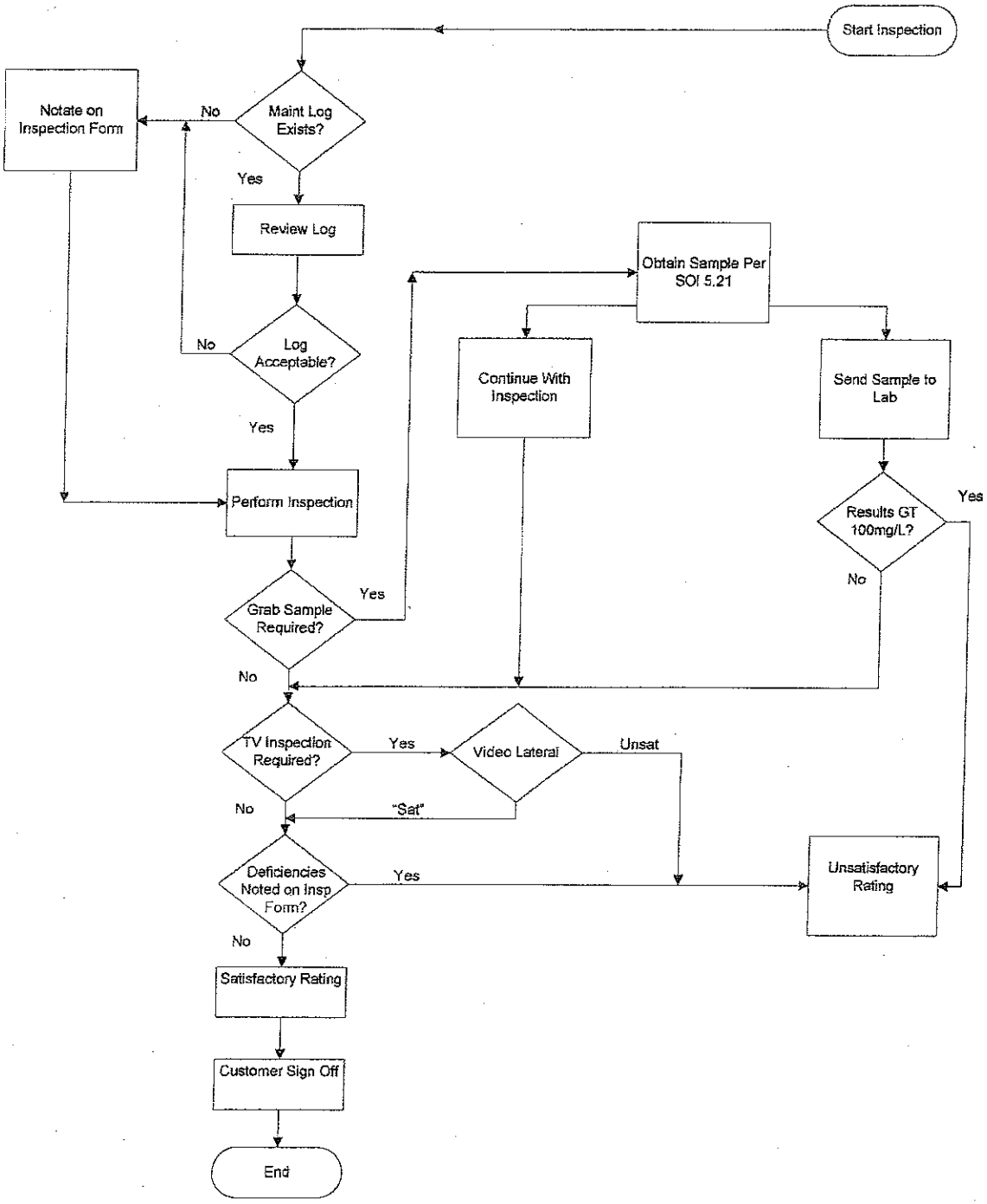
VII. DISCHARGE STANDARD

Section I, 1.2.10 of the current BJWSA Sewer Use Ordinance prohibits the discharge to BJWSA's sewer collection system of "any wastewater containing fats, wax, grease or oils, of animal or vegetable origin (whether emulsified or not), in excess of 100 mg/L or containing substances which may solidify or become viscous at temperatures between 32°F and 150°F, without prior approval of BJWSA." The maximum temperature of discharged wastewater into passive type grease interceptors must not exceed 105°F. The chart below indicates the melting points and densities of commonly used cooking products.

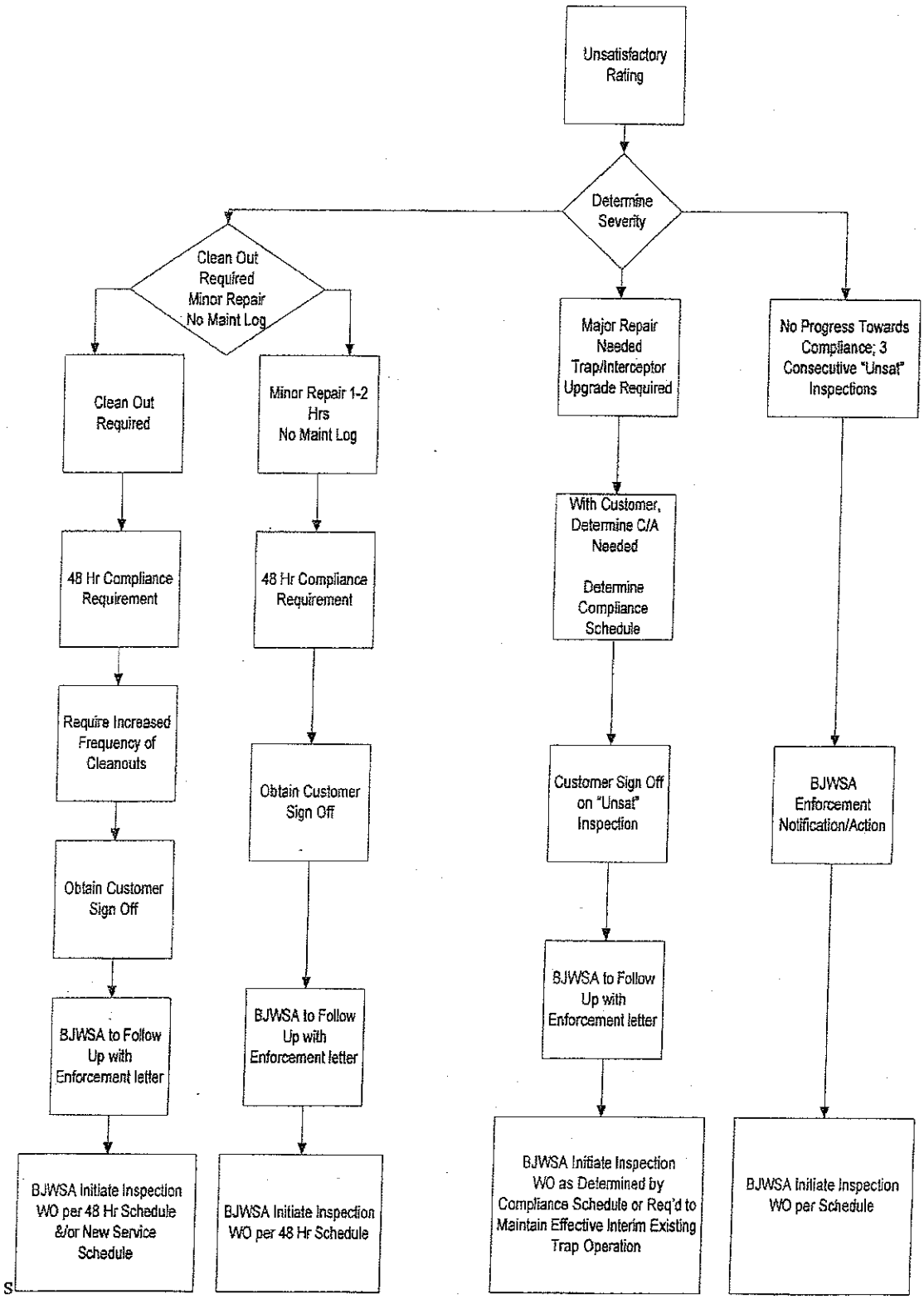
Substance	Melting Point		Density	
	°F	°C	Lbs/gal	Kg/L
Tallow	108	42	7.88	0.945
Palm Oil	95	35	7.63	0.915
Cocoa Butter	93	34	8.04	0.964
Coconut Oil	77	25	7.67	0.920
Palm Kernel Oil	75	24	7.70	0.923
Peanut Oil	37	3	7.62	0.914
Cotton Seed Oil	30	-1	7.65	0.917
Olive Oil	21	-6	7.66	0.918
Poppy Seed Oil	5	-15	7.71	0.925
Sesame Oil	3	-16	7.66	0.919
Soybean Oil	3	-16	7.73	0.927
Corn Oil	-4	-20	7.69	0.922

VIII. TRAP INSPECTION PROCESS

A. Original Inspection



B. Re-inspection Process



IX. ENFORCEMENT

Enforcement of this Standard shall be in accordance with the provisions of the most current BJWSA Sewer Use Ordinance. Failure to comply with this Standard or any facility receiving three (3) consecutive unsatisfactory evaluations shall be grounds for penalty imposition and/or discontinuance of water and/or wastewater service. Additionally, failure to comply may result in notification to the Beaufort County Health Department for request of enforcement action, which may lead to revocation of food service permits.

BJWSA may elect to request from the appropriate building official that certificates of occupancy be withheld until compliance with BJWSA's requirements, including grease trap compliance, is fully met.

In the event of a food service establishment's grease-handling facilities are either under-designed, substandard, or poorly operated, the owner(s) will be notified, in writing, of the require improvements and given a compliance deadline not to exceed three (3) months to conform with the requirements of this Grease Standard. An extended deadline may be granted by BJWSA upon review and determination that adequate and timely progress is being made by the customer to comply with the Discharge Standard.

X. ATTACHMENTS

A. Grease Trap/Interceptor Application

B. Grease Trap/Interceptor Maintenance Log Form

C. Grease Trap/Interceptor Inspection Form

D. Typical Underground Grease Trap

E. Table B8.8 Flow of Water through Schedule 40 Steel Pipe

Attachment A

APPLICATION TO INSTALL GREASE INTERCEPTOR

Establishment Name:_____
Address:_____ Phone:_____

Name of applicant / restaurant owner:_____
Address:_____ Phone:_____

Please Provide the Following Information:

Seating Capacity:	_____	Hrs/Day of Operation:	_____
Expected Services/Day:	_____	Proposed Menu:	_____
Qty Servings/Peak Hr:	_____	Size of Establishment (sq ft):	_____
Size of existing trap:	_____		
Bldg Former Use:	_____		

Size / Number of Kitchen Units Served by Interceptor:

Size / Number (LxWxD)	Type of Unit	Size / Number	Type of Unit
___/___	Single compartment scullery sink	___/___	Hand sink
___/___	Double compartment scullery sink	___/___	Oven (ex: wok)
___/___	Triple compartment scullery sink	___/___	Other (attach to application)

Note:

- **Any sink, etc. discharging into the sanitary sewer used for cleaning and or food preparation must be connected to a grease interceptor.**
- **Dishwasher, Garbage Disposals, and Mop Sinks shall not be tied into Grease Interceptor.**

Comments:

_____
_____

1. I certify that the above information is correct to the best of my knowledge. Also, I understand that a **$25.00** grease trap origination fee will be charged for processing this application;
2. I have read, understand, and comply with the BJWSA Grease Trap and Grease Interceptor Standards.
3. I understand the limit for fats, oils, and grease is 100 mg/L in water discharged to the BJWSA system.

Date:_____ Signature:_____

Submit application with plans and specifications, or a riser / plumbing diagram to the following address:

Beaufort Jasper Water and Sewer Authority
Engineering Department
6 Snake Rd.
Okatie, SC 29909
PH 843.987.7251

Attachment B

GREASE TRAP INTERCEPTOR MAINTENANCE LOG

Establishment Name:_____

Contact Name:_____ Phone #:_____

Trap No.:_____ Trap Location:_____

Inspector:_____ Phone #:_____

Service Date	Name of Vendor/Employee Performing Service	Initials	Method of Disposal	BJWSA Inspector Sign Off	BJWSA Sign Off Date

NOTE: BJWSA reserves the right to have copies of these maintenance logs.
1 Log sheet per each trap/interceptor.
Each log must be conspicuously posted for BJWSA review

Attachment C

Field Operations Department
Grease Trap Inspection

Projected Start Date:		□ Initial Inspection □ Routine Inspection □ Follow Up Inspection		
Crew #	Name	Est. Hrs.	Act. Hrs.	Work Order #/Acct #

ESTABLISHMENT	LOCATION

MANAGER'S NAME	OWNER'S NAME

PHONE 1	PHONE 2

Trap Information

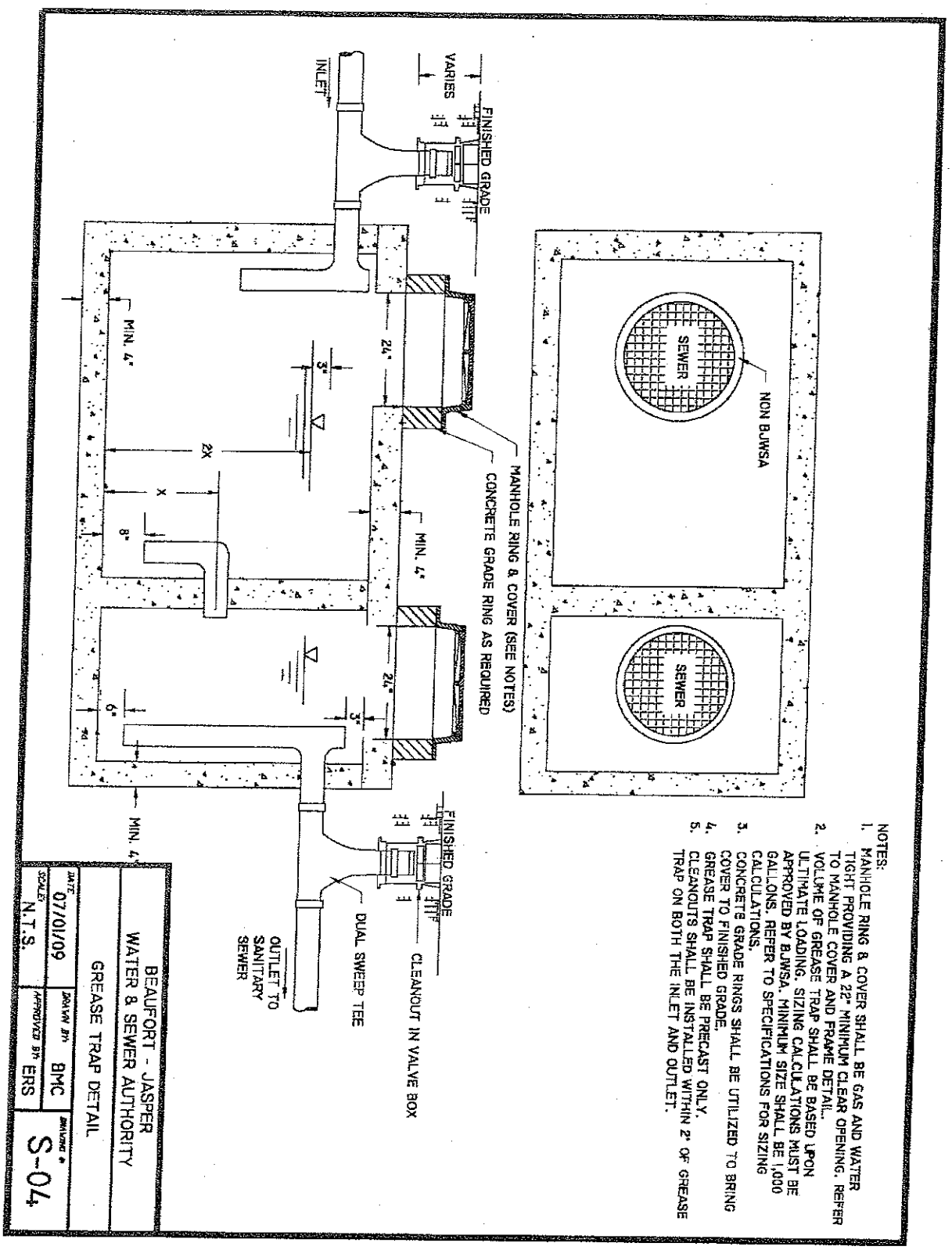
Last Maintenance Date: _____	Frequency: _____
Last Inspection Date(s):	

Overall Rating: □ **Satisfactory (1)** □ **Unsatisfactory (2)** **Reason for Unsatisfactory Rating** (check boxes that apply)	
□ A. Broken/Missing Access Cover/Heavy	□ L. Dishwasher Tied Into Trap
□ B. Access Point Below Grade	□ M. Dirty (Needs Pump Out)
□ C. Baffle Wall/Screen Missing	□ N. Defective Grease Trap
□ D. Not Accessible for Maint. or Inspection	□ O. Broken/Missing Gasket
□ E. Non-Approved Grease Interceptor	□ P. No Maintenance Log
□ F. No Grease Trap Installed (Send Letter)	□ Q. Not Properly Located or Installed
□ G. Inlet / Outlet "T" Defective	□ R. Grease mat depth of _____ exceeds limit
□ H. Trap Temp. GT 105◦ F	□ S. Visible Grease Discharge
□ I. Trap Sample Required	□ T. Trap Needs Upgrade; Incorrect Size
□ J. Trap Sample GT 100 mg/L	□ U. Not Cleaned Per Req'd Frequency
□ K. No Grab Sample Port	□ V. No Flow Control

Previous Comments:	
Current Comments:	

Establishment Official _____ BJWSA Inspector _____ Inspection Date _____

Attachment D



Attachment E

TABLE B8.8 FLOW OF WATER THROUGH SCHEDULE 40 STEEL PIPE1

gal/min	Velocity ft/s	Velocity ft/s	Velocity ft/s	Velocity ft/s	Velocity ft/s	Velocity ft/s	Velocity ft/s	Velocity ft/s
0.2			**3/8 in.**	**1/2 in.**				
0.3			0.50	0.32				
0.4			0.67	0.42	**3/4 in.**			
0.5			0.84	0.53	0.30			
0.6			1.01	0.63	0.36			
0.8			1.34	0.84	0.48	**1 in.**		
1			1.68	1.06	0.60	0.37	**1 1/4 in.**	
2			3.36	2.11	1.20	0.74	0.43	**1 1/2 in.**
3			5.04	3.17	1.81	1.11	0.64	0.47
4			6.72	4.22	2.41	1.49	0.86	0.63
5	**2 in.**		8.40	5.28	3.01	1.86	1.07	0.79
6	0.57	**2 1/2 in.**	10.08	6.33	3.61	2.23	1.29	0.95
8	0.77		13.44	8.45	4.81	2.97	1.72	1.26
10	0.96	0.67		10.56	6.02	3.71	2.15	1.58
15	1.43	1.01	**3 in.**		9.03	5.57	3.22	2.37
20	1.91	1.34	0.87	**3 1/2 in.**	12.03	7.43	4.29	3.16
25	2.39	1.68	1.09	0.81		9.28	5.37	3.94
30	2.87	2.01	1.30	0.97	**4 in.**	11.14	6.44	4.73
35	3.35	2.35	1.52	1.14	0.88	12.99	7.51	5.52
40	3.83	2.68	1.74	1.30	1.01	14.85	8.59	6.30
45	4.30	3.02	1.95	1.46	1.13		9.67	7.09
50	4.78	3.35	2.17	1.62	1.26		10.74	7.88
60	5.74	4.02	2.60	1.95	1.51	**5 in.**	12.89	9.47
70	6.70	4.66	3.04	2.27	1.76	1.12		11.05
80	7.65	5.36	3.47	2.60	2.02	1.28		12.62
90	8.60	6.03	3.91	2.92	2.27	1.44	**6 in.**	14.20
100	9.56	6.70	4.34	3.25	2.52	1.60	1.11	15.78
125	11.97	8.38	5.43	4.06	3.15	2.01	1.39	19.72
150	14.36	10.05	6.51	4.87	3.78	2.41	1.67	
175	16.75	11.73	7.60	5.68	4.41	2.81	1.94	
200	19.14	13.42	8.68	6.49	5.04	3.21	2.22	
225		15.09	9.77	7.30	5.67	3.61	2.50	
250			10.85	8.12	6.30	4.01	2.78	
275			11.94	8.93	6.93	4.41	3.05	
300			13.00	9.74	7.56	4.81	3.33	
325			14.12	10.53	8.19	5.21	3.61	
350				11.36	8.82	5.62	3.89	
375				12.17	9.45	6.02	4.16	
400				12.98	10.08	6.42	4.44	

	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity
gal/min	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s	ft/s
425				13.80	10.71	6.82	4.72	
450				14.61	11.34	7.22	5.00	
475					11.97	7.62	5.27	
500					12.60	8.02	5.55	
550					13.85	8.82	6.11	
600					15.12	9.63	6.66	
650						10.43	7.22	
700						11.23	7.78	
750						12.03	8.33	
800						12.83	8.88	
850						13.64	9.44	
900						14.44	9.99	
950						15.24	10.55	
1000						16.04	11.10	
1100						17.65	12.22	
1200							13.33	
1300							14.43	
1400							15.55	
1500							16.66	
1600							17.77	
1800							19.99	
2000							22.21	

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Mohinder L. Nayyar, *Piping Handbook*, Seventh Edition, McGraw-Hill 2000