PRESENTATION OF

ORRIN CROOKS
MOSCOW, IDAHO

IN NOMINATION
FOR
IDAHO

OPERATOR OF THE YEAR AWARD
1968

Operator Feted

MOSCOW, Idaho — Orrin Crooks, superintendent of the Moscow Sewage Disposal Plant, recently was awarded the William D. Hatfield award, given by the Water Pollution Control Federation to recognize sewage treatment plant operators.

AWARD PRESENTED — Orrin Crooks, Moscow's sewage treatment plant operator, Tuesday night during regular City Council session, was presented a service award by Mayor Fred W. Handel. The award went to Crooks, 1967 president of the Pacific Northwest Pollution Contrl Association, "for recognition of outstanding service to the menber association and the Water Pollution Control Federation."

OPERATOR OF YEAR — Orrin Crooks, Moscow Waste Water Treatment Plant operator, was awarded the Operator of the Year award by the Pacific Northwest Pollution Control Association. The award is based on a report, which includes overall plant operations, record keeping, operations analysis, participation in school, section meetings, certification, plant appearance, periodic reports on the plant operation public relations, and membership and activities in the association. The award was presented to Crooks at the Association's annual meeting in Penticton, B.C. Crooks is past president of the Association.

Presentation

to

Pacific Northwest Pollution Control Association

of

O R R I N C R O O K S

Moscow, Idaho

Waste Water Treatment Plant

As a Candidate

for

"O P E R A T O R O F T H E Y E A R A W A R D"

1968

1. Level of Overall Plant Operation.

The Moscow waste water treatment plant under the direction of Orrin Crooks has consistedly produced a very high degree of treatment with a removal of over 95% and with a bacterial reduction to a point considerably less than the receiving stream. Mr. Crooks runs more laboratory studies on his plant than does anyone in Northern Idaho and all that is necessary to control the plant's operation at its high level of efficiency. Only at one time did the digesters give any great degree of difficulty and this was due to a quantity of highly toxic chemicals which were dumped by the University of Idaho which made it mandatory to dump the entire contents of the digesters and start them over.

The State Health Department feels that this plant is getting the highest degree of treatment possible due to the excellent operation of Mr. Crooks and his assistant. The plant operates on a budget of around $18,000 per year. The community has made it possible for Mr. Crooks to travel in his official capacity to the various meetings while in office as president, vice-president, program committeeman and local arrangements committeeman for the Pacific Northwest Pollution Control Association.

Inasmuch as the plant is in a University town of around 10,000 people, the flow fluctuates greatly during the times the university is open or closed for the holidays. Mr. Crooks is able through the

keeping of records to keep the plant adjusted through the flexibility in the design of the plant to put out a good effluent at all times.

The plant has one operator assisting Mr. Crooks with less than one year of experience in sewage treatment plant operation. The assistant operator, Lyle Brouse, made the highest grade of anyone in the certification examinations in 1968. He has been trained by Mr. Crooks to take responsible charge of the plant during periods of holiday and days when Mr. Crooks has off.

The plant is always kept in a condition so that it is ready for inspection because of the visitors which come to Moscow to visit the university.

2. Record Keeping and Operational Analysis.

Orrin Crooks has kept all of the records that have been required by the State Health Department and his own city engineer. He has developed records of his own which explain some of his operational problems better than the normal type of records which are expected from treatment plant operators in the State of Idaho.

The State Regulatory Engineer often sends operators and even prospective state engineers to the plant to work with Mr. Crooks to be taught plant operation.

Mr. Crooks has made the plant a part of his hobbies and is not satisfied until he has found the answer to a problem.

He has built special dissolved oxygen equipment as well as many labor saving devices.

3. Participation in Schools, Section Meetings, Certification, etc.

Orrin Crooks has participated in most of the schools we have held in the last nine years with the exception of times when he has sent his assistant operator to the school and had to stay home to maintain the plant. He has helped in the instruction, especially in the laboratory where he opens up his plant laboratory during the time the school is being held in Moscow, and helps the individual operators run samples in his plant with his equipment. Through his role in the certification program, having been a member of the certification board in the State of Idaho for the last eight years, he has helped in the operation of the Short Schools and the planning thereof. In his connection with the PNWPCA on its program committee and as president, he has been able to secure some of the staff necessary to make the short schools better.

Orrin Crooks attends the local section meetings of the Inland Empire Section and was its President in 1964. He has been instrumental through his participation and interest in the certification short school program of the State of Idaho and at the operators' meetings at the section level to bring about a reputation of leadership in the field of waste water treatment.

The Idaho State Health Department feels that Orrin Crooks has been one of our greatest assets at the operator level that

No. 3 Continued.

the State of Idaho has ever had. Through his attendance at meetings throughout the Northwest and Canada, his involvement in the programs of the Pacific Northwest Pollution Control Association, he has given the State of Idaho a reputation for which we feel justly proud.

4. The Plant Appearance.

The Moscow plant has been renamed the City of Moscow Waste Water Treatment Plant. It is kept well painted; presents a very pleasing appearance from the highway; the grounds are always in excellent shape, with flowers and grass kept well mowed. The plant is always clean and even when repair is going on the plant does not look cluttered. The State Health Department feels that this plant is a model of good operation.

The laboratory at this plant is always open to visitors. Mr. Crooks is available and has been used by several northern Idaho cities as a training ground and instructor for their plant personnel. The plant is used in demonstrations for the Short School program when it is held in Moscow, at which time the laboratory is kept open evenings for operators from all over the State of Idaho and others at the short course to work in and meet to get ideas which they can take home to their own plants. The laboratory is probably one of the best waste water treatment plant laboratories in the State of Idaho.

Mr. Crooks is ingenious in designing time-saving equipment such as continuous oilers to keep his plant maintenance to a minimum.

5. Monthly and/or Annual Reports.

Orrin Crooks won the Class II Operator Report in 1964 from the Pacific Northwest Pollution Control Association. He also puts out a monthly report which is a summary of the data he collects at the sewage treatment plant (see enclosed sample). The monthly data sheet which many of the operators submit is somewhat confusing to the city council members but Orrin has devised his monthly report form so as to make it more readable to the lay person on the council.

Enclosed is a letter from his city engineer which certifies the fact that he is submitting reports as required. We feel that these reports are sufficient and actually accomplish more in the way that they are used than the annual report which Mr. Crooks used to submit.

The enclosed annual report for 1964 shows the plant in picture form as well as summarizing the design and operation.

6. Public Relations Activities at the Local Level.

Orrin Crooks puts on classes in the plant every year with generally three college groups attending, two or more grade school classes, plus individuals from other organizations. He has given talks to the Chamber of Commerce, Rotary Club and once to an Engineering Society at the college. He is very well thought of in his community and has been quoted in newspaper articles.

The Moscow waste water treatment plant was featured in the Water Works and Wastes Engineering publication in the October, 1964, issue (see article enclosed).

7. Membership and Activities in the Pacific Northwest Pollution Control Association.

Orrin Crooks was the Vice President of the Pacific Northwest Pollution Control Association in 1966 and was the President in 1967. Prior to that time, Orrin had worked on the Program Committee and on the Local Arrangements Committee of the Association.

He also has been very active in attending meetings of the Association and in attending the Section Meetings of the Inland Empire Section of the Pacific Northwest Pollution Control Association. In 1964 he was the Section President and has worked on various committees of the local chapter.

CITY OF MOSCOW

6 South Main

MOSCOW, IDAHO
83843

Telephone: 882-5553—Area Code: 208

May 14, 1968

Mr. Arthur Van't Hul
North Central District
Health Department
Box 637
Lewiston, Idaho 83501

Dear Art:

In response to our telephone conversation of May 13, 1968, please be advised that reports from our Waste Water Treatment Plant operator are prepared and presented in accordance with the following procedure.

Monthly reports are required by the City Council and submitted through my office. These reports are presented to the Moscow City Council at the second Council meeting of each month. The contents of the report generally include data on laboratory tests run during the month and the efficiency of the unit operations of the plant. Specifically, such tests will include BOD, Suspended Solids, Settleable Solids, DO, pH, Temperature, Bacterial Count, Volatile Solids, Alkalinity, Volatile Acids, Methane Production, and Carbon Dioxide. Additional tests are run and reported for any unusual conditions or operations encountered during the month.

The monthly report will, also, note any operational repairs or maintenance which is of a major nature or differs from those normally encountered.

Copies of these reports are kept on file in my office as well as at the Waste Water Treatment Plant. In addition, the Waste Water Treatment Plant's complete test records are carefully filed for future reference at the plant.

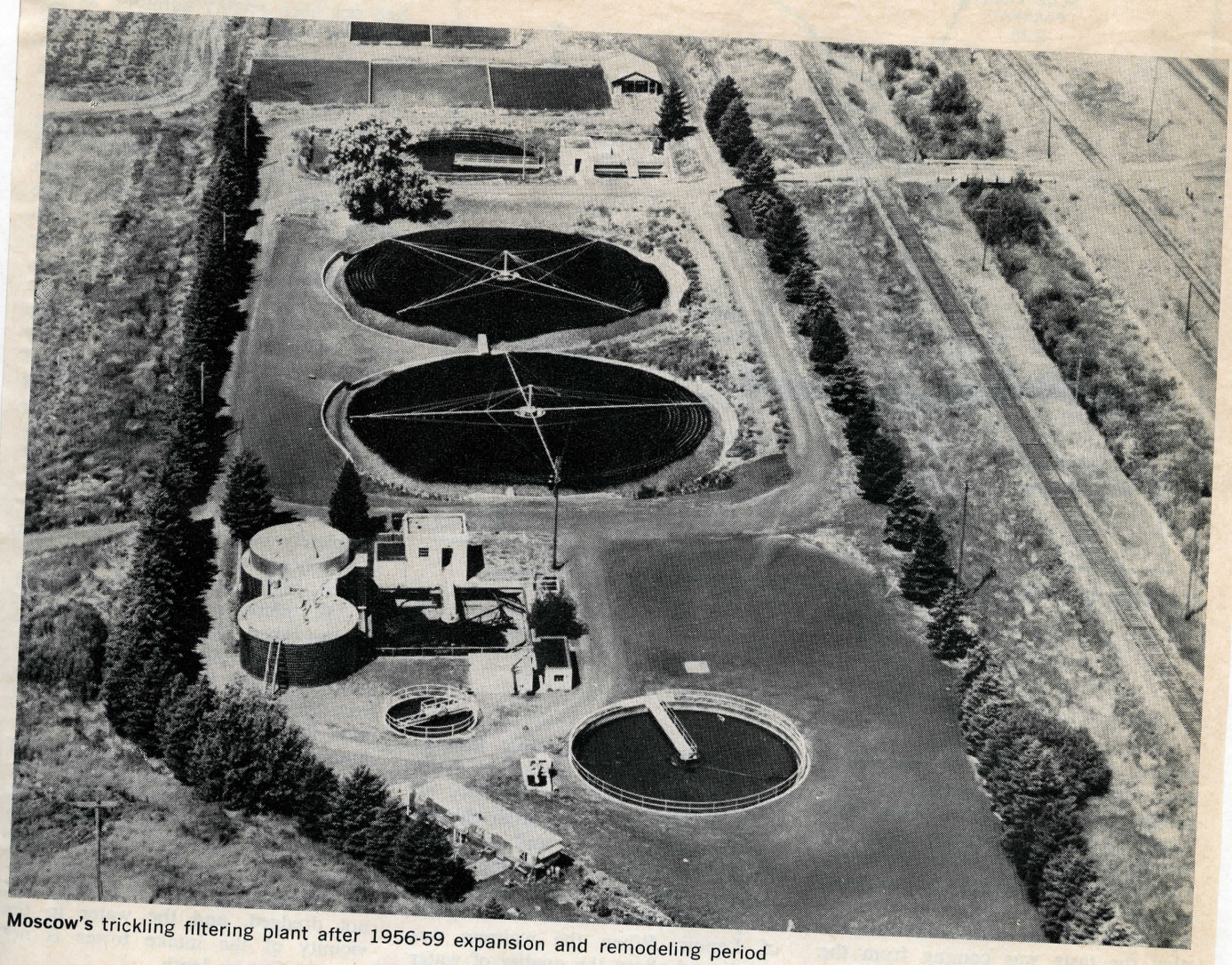
I trust this will provide the necessary explanation and information. Please feel free to request any additional information you may need.

Very truly yours,

Dick

Richard O. Day, P.E.
Director of Public Works

ROD:jl



Moscow's trickling filtering plant after 1956-59 expansion and remodeling period

Evolution of a Treatment Plant

A span of 60 years encompasses a transition from septic tank to complete treatment involving a series of additions, enlargements and up-dating of equipment and process

By Keith E. Stokes
City Engineer, Moscow, Idaho

Moscow, Idaho, has completed the modernization of its sewage treatment facilities, and with the addition of these improvements, both city and state feel that the sewage treatment plant is one of the best in the northwest for the population served.

Moscow's first sewage treatment facility was a large septic tank constructed in 1904. It was located approximately ¾ of a mile west of the center of the city. By 1918 this tank was outmoded and the city hired Philip H. Dater, a consulting engineer from Portland, Ore., to design new facilities. At a cost of $62,000 and using "day labor," a double chamber septic tank, a dosing chamber, and four contact beds were constructed about 1½ miles west of the central business area and very near the Idaho-Washington State border.

The new treatment plant is constructed in the same general area as this 1918 improvement, and the effluent is still discharged into Paradise Creek, which almost immediately enters the State of Washington.

Existing concrete structures used

In 1938, under P.W.A., the city constructed its first modern sewage treatment plant. Moscow, at this time, had a population of approximately 8000 including the University of Idaho, and L. R. Stockman, a Baker, Ore., consulting engineer designed a plant for a population of 12,000 people. By using many of the existing concrete chambers and footings, the engineer provided the city with a primary-secondary plant, at a cost of $71,800. This plant, though small, had the following facilities:

Grit chambers

Comminutor
Primary and secondary clarifiers
Primary and secondary digesters
Flocculators
Two trickling filters
Pump and chlorination buildings
Chlorine contact chamber
Sludge drying beds

This installation served in a very efficient manner although it was impossible to verify the hydraulics through the plant.

Enlargement and modernization

In 1956, Moscow passed a bond issue for water development, a new sewage plant, and new trunk sewers. The firm of Stevens & Thompson, Consulting Engineers of Portland, Ore., was engaged to design the new facilities, Henry George and Sons and Dunham Brothers were awarded the contract to remodel the sewage plant in the amount of $195,819, and Intermountain Construction Company was awarded the new trunk sewer line for $142,391. The Federal Government participated in 30% of the total cost of the entire project.

The design for remodeling of the plant enabled the contractor to use several of the existing concrete structures with minor changes, but the major portion of the plant was completely redone.

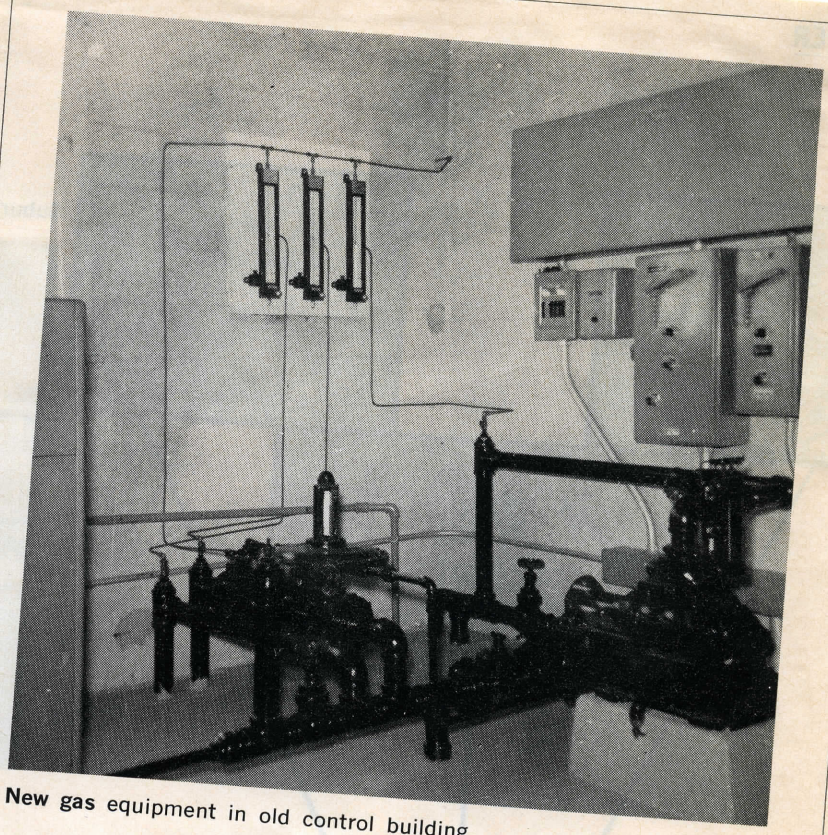
The only work on the digesters was a new mixer in the primary. The filters remained the same except for new exterior walls and two additional arms. The grit channel was eliminated completely. The flocculators were also removed and a 20-ft diameter sludge thickener added. There was no change in the old primary and secondary clarifiers or the gas equipment. Additions were:

50-ft dia primary clarifier
60-ft dia secondary clarifier
20-ft dia sludge thickener
Barminutor, Chicago Pump Co.
Grit Classifier, Door-Clone
Three sludge drying beds
Chlorination equipment
Flow meters
Re-circulation pump
Gas boiler

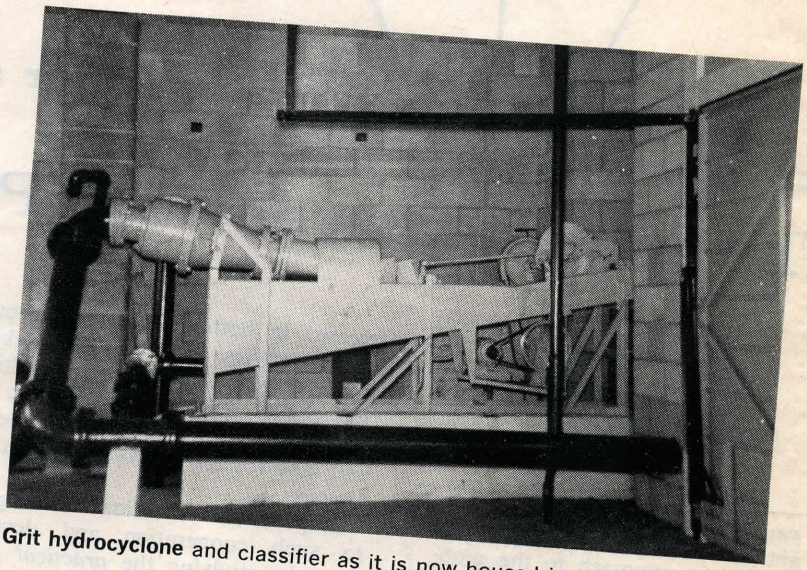
Since the necessary capital to add a laboratory or other finishing touches was not available under this contract, the remodeling was centered completely on the actual mechanics of the plant. The remodeled plant was placed in full operation in August 1959. All parts of this plant operated well and the effluent proved to be very satisfactory.

After all expenses were paid and the last amount received from the Federal Grant, it was noted that a surplus of approximately $25,000 existed to use for further expansion

Continued on page 81



New gas equipment in old control building



Grit hydrocyclone and classifier as it is now housed in new shop building

Typical monthly laboratory data report

Flow 1.09 MGD	D.O. ppm	B.O.D. ppm	Settable solids ml/1	Suspended solids	pH	Temp. °F.
Raw	0.0	212	7.5	225	7.5	68
Prim. eff.	1.8	62	0.5	46	6.8	
Filter eff.	3.7	15	1.1	33	6.6	
Final eff.	5.6	10	0.0	11	6.7	

B.O.D. reduction 95.3%
Suspended solids red. 95.1%

TREATMENT PLANT

Continued from page 47

of sewer facilities. Early in 1961 a Federal Grant was offered for additional construction and a contract was awarded in August 1961 to John Thomas, General Contractor, Moscow, Idaho for $42,961. This work included the following facilities:

Laboratory and office building
Shop building
Comminutor, Worthington
New gas equipment
Automatic chlorination equipment
Complete underground sprinkling system
Sludge stand pipe
Remodeling of old primary and secondary clarifiers.

The additions were completed by July 1962. With the laboratory, now in use, the records on the plant operation are much more complete. The laboratory building also houses adequate office space for the operator and his assistant, and modern restroom and shower facilities.

The shop building not only provides the necessary space for minor repairs, but also houses the grit classifier which had been a source of trouble during the winter due to its previously exposed position.

The comminutor was placed in an existing by-pass channel and has been in continuous operation since its installation; the Barminutor has been placed on a stand-by basis.

The new chlorination equipment provided now permits closer control of the residual and more economical use of chemicals. Post chlorination maintains a residual in the final effluent of 0.1 mg/l, using about 30–35 lb per 24 hr. The sludge thickener requires 5 lb per 24 hr for odor control. Membrane filter bacteria count of the final effluent is now 100–500 per 100 ml.

Approximately 2400 gal of raw sludge are pumped from the thickener to the primary digester each day at a solids content of 7.3 per cent. Primary digester temperature is maintained at 95° F; the pH is 7.3 and the alkalinity 2300 to 2800 mg/1. Volatile acids are 250–300 mg/l equivalent to a reduction in the primary of 52 per cent. The primary and secondary detention times are 32 and 30 days, respectively. Gas production is 11,000 cu ft per day.

Farm-land disposal of sludge

The sludge stand-pipe, which was installed to allow for the disposal of sludge in liquid form, has proved very effective. A local farmer places a city-owned tank on his truck and hauls the sludge directly to the field. The tank is equipped with a splash plate and valve which can be operated from the cab of the truck allowing quick and easy spreading. This solves a big problem for the treatment plant in that the long, wet winters prevented the drying of sludge on the beds to the extent that we were faced with the possibility of having to construct additional drying beds. With the capacity for disposal of sludge in liquid form, the existing drying bed areas are now considered adequate for years to come.

The existing plant located on State Highway No. 8 between Moscow, Idaho and Pullman, Washington, gives the appearance of a park area with beautiful grass, many flowers and evergreen trees. It is open to the public, and classes from local schools take an annual tour of the plant. Engineering students from both the University of Idaho and Washington State University tour the plant, take samples for class work, and are welcome to use the facilities we have available.

The city of Moscow is, and has every right to be, proud of its modern sewage treatment plant. □□

MOSCOW, IDAHO WASTE WATER TREATME

PLANT FLOW ANAL

DATE	Raw Sewage		Dissolved Oxygen PPM				Biochemical Oxygen Demand PPM				Suspended Solids		
	FLOW M.G.D.	TEMP. °F	RAW	PRIMARY	FILTER	FINAL	RAW	PRIMARY	FILTER	FINAL	RAW	PRIMARY	FILTER
1	.85												
2	.85												
3	1.10												
4	1.17												
5	1.08												
6	1.17												
7	1.06												
8	1.07												
9	1.12												
10	1.33												
11	1.29												
12	1.16												
13	1.26												
14	1.33												
15	1.55												
16	1.58		.75	2.7	4.55	?4.9	260.9	127	26.8	?9.72	432.4	250	123
17	1.25												
18	1.28		.3	1.4	4.8	?4.9							
19	1.28		0.0	0.4	4.0	?4.6							
20	1.32												
21	1.26												
22	1.25												
23	1.23												
24	1.25												
25	1.10						247	124	34	4.6			
26	1.10												
27	.96												
28	.90												
29	.99		0.5	1.6	5.25	?6.05							
30	1.08		0.0	0.2	4.1	?4.9							
31	1.12												
AVE.	1.16		.31	1.3	4.5	5.2	254	125.5	30.4	7.2	432.4	250	123

PLANT EFFEICIENCIES % REDUCTION

Settleable Solids 96 %

Suspended Solids 84 %

B.O.D. 96 %

75

Volatile Solids (sludge) ~~47~~ %

WATER TREATMENT PLANT OPERATION RECORD

PLANT FLOW ANALYSIS

PPM	Suspended Solids PPM				Settleable Solids ml/l.				pH		Chlorination				
FINAL	RAW	PRIMARY	FILTER	FINAL	RAW	PRIMARY	FILTER	FINAL	RAW	FINAL	lbs/day	RESIDUAL	BACTERIA per 100 ml FINAL EFF.	GALLONS PUMPED TO	
											14	0.15			
											23	0.1			
											25	0.1			
											30	0.1			
											35	0.1			
											33	0.1			
											33	0.08			
											31	0.05		3600	
											32	0.1			
											34	0.1			
											29	0.1			
											30	0.1			
											35	0.08			
											34	0.0			
7.9.72	432.4	250	123	68.4	5.1	1	0.8	0.2			39	0.08			
											50	0.15			
											39	0.08			
											27	0.1			
											33	0.15			
											30	0.1			
											21	0.05			
											22	0.08			
											31	0.1			
4.6											43	0.08			
									8.1	6.7	33	0.1			
											31	0.1			
											21	0.08			
											19	0.05			
											26	0.05			
											30	0.08			
											28	0.05			
7.2	432.4	250	123	68.4	5.1	1	0.8	0.2	8.1	6.7	33	.09		3600	

75

sludge) ~~47~~ %

MONTH JANUARY 19 68

PRIMARY DIGESTER ANALYSIS

% Solids		% Volatile								
RAW	DIGESTED	RAW	DIGESTED	TEMP. °F	pH	ALKAL. ppm	VOLATILE ACID ppm	DIGESTER GAS PRODUCED cu. ft./day	% CO_2	REMARKS
				91				11,190		
				88	7.1	2700	250	8,970	35	STARTED HAULING Sludge U of I STARTS
				90	7.0	2800	110	8,610		
				91				10,610		
				92				13,300		
				94				14,520		
				96				15,220		
				98				15,900		
				95				12,670		LOW VOLATILE & High % Solids IN digested due to CLAY WASHED IN
8.3	5.1	70.5	34	94				13,350	35	
				97				14,810		
				94				15,330		
				96				15,890		
				94				16,330		
				92	7.0	2840	80	14,400		
9.6	4.8	66	37	93	7.0	3020	310	16,040		
				96				17,120		
				93	7.0	2940	230	16,960		
				92				15,330		
				95				18,070		
				95				18,750		
				92				17,210		
				94				16,170		
				92				17,160		
				95	7.1	2820	190	17,490		Hauled digested Sludge 3 days 80,000 gl. included sujoernatant.
				92				15,310		
				92				14,850		
				92				13,630		
				92	7.0	3160	200	11,270		
4.7	3.6	73	39	93	6.8	2800	200	12,520	35	
				94	6.9	2660	190	14,790		
7.5	4.5	70	37	93	7.0	2860	198	14,312	35	

SIGNED Brian Crooks

TITLE Supt.

Memo - Art:

Thought perhaps this report submitted to Council each month would also be more appropriate for your needs rather then the large lab. sheet.

Out of curiousity I got to playing around with average digester analysis on this report. I took the 3980 gl/day sludge pumped to digesters times 8.3 = 32,370 lbs x 6.8% Solids = 2201 lbs x 70% volatile = 1540 x 75% actual reduction = ? 1155 lbs volatile destroyed and using ~~x~~ 14 cft of gas for every lb. volatile destroyed x 1155 figures out 16,170 cft/day which is only 260 cft. more than the actual metered gas production per day. Since I have no real accurate way to measure sludge volume only by pump stroke and capacity I would say this was pretty close. To what, I wouldn't know except maybe that the statement, for every lb of volatile ~~material~~ material destroyed in a digester produces approx. 14 cft of gas. Or if an operator reports a lot of figures made up out of his head an not actual analysis they had better be reasonable or someone is liable to set down and figure out he is a liar or in a lot of trouble.

Just my little thought for the day

Orin

SEWAGE TREATMENT PLANT

REPORT

MARCH, 1968

Lab Data averages for the month:

	Raw	Pr. Clarifier	Filter	Final
BOD. ppm	280	118	38	12
Suspended solids ppm.	233	83	39	18.5
Set. solids ml/l	7.3	1.7	0.75	trace
DO ppm	0.0	2.5	3.7	5.7
pH	7.3			6.6
Temperature	62°F.			
Bacteria count				42/100 ml.

Total lbs. chlorine used, 995 average 32/day
Residual 0.08 ppm.
Average daily flow 1.12 M.G.D.

Digester analysis:

	Raw	Digested
Percent solids	4.0	2.1
Percent volatile solids	77	63 ?

Percent reduction volatile solids 55
Average temperature 96°F.
pH 6.9
Alkalinity 2616 ppm.
Volatile acid 160 ppm.
Gas production 14,800 cf/day
CO_2 content 35%

The year's accumulation of grit, about 75 cubic yards stored on drying beds, was hauled and spread on farm fields.

Two days were spent trimming trees away from power line connecting east and west ends of plant.

Clarifier iron works are being spot painted or completely redone where requfred.

Dog pound was cleaned and renovated in preparation for April leash law. A set of identification chain collars and number tags were made to facilitate identification of impounded dogs.

Sewage plant and City hosted the quarterly meeting of the Inland Empire Section of P.N.P.C.A. at Grain Growers Auditorium. Twenty-five members were present. Richard Day welcomed the group on behalf of the City and gave a short talk on the City's new water storage and control system. Speakers for the day were Dr. Alfred Wallace and Karl Salskov of the University of Idaho. A business meeting was held and films shown in relation to bacteriology and waste treatment. The meeting adjourned at 3:00 P.M. when several members toured the Moscow Treatment Plant.

Orrin Crooks attended the one day symposium on Potato Waster Treatment held at the University of Idaho.