Water Quality Status Report No. 3

REPORT ON POLLUTION PROBLEMS IN INDIAN CREEK
Ada and Canyon Counties, Idaho
1958 -- 1959

November, 1959

State of Idaho
DEPARTMENT OF HEALTH
Engineering and Sanitation Section

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REPORT ON POLLUTION PROBLEMS IN INDIAN CREEK

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Report on Pollution Problems in Indian Creek

Introduction

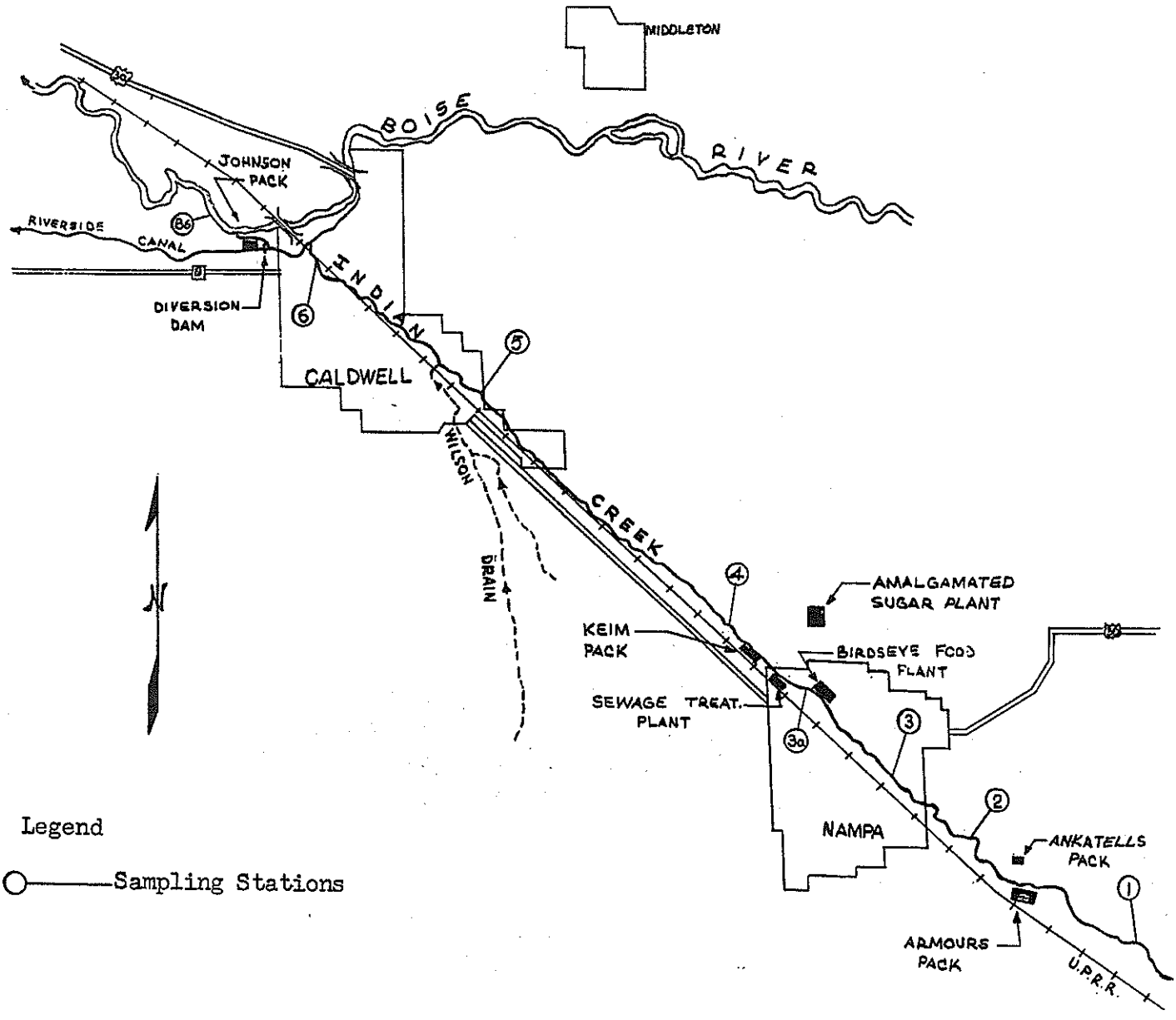
The purpose of this report is to show the results of our investigation concerning the waste disposal problems occurring along Indian Creek in Canyon County, Idaho.

A series of surveys have been made at various times throughout the past year in an effort to secure a complete picture of the problem. These surveys were made in February, August and December of 1958, and again in February of 1959.

During the study, a series of samples were collected at strategic points along Indian Creek for chemical, bacteriological, and biological analyses. Also the various industries and municipalities along Indian Creek were contacted to determine the volume and strength of wastes being discharged into the stream.

The stream pollution study was made by H. G. Formo and M. D. Alsager, state public health engineers, and by R. P. Olson, public health biologist. The laboratory work was done by personnel in the Boise laboratory of the State Department of Health.

Indian Creek is located in Ada and Canyon Counties in Southwestern Idaho. It has its origin about thirty miles southeast of the City of Nampa. It is a small meandering stream above Nampa and is fed mainly by irrigation runoff and seepage water. However, from Nampa to Caldwell (see Fig. 1) the stream grows in size because of its junction with several drain ditches, the largest being Wilson Drain which, at times, has twice the volume of Indian Creek. During the winter months, the stream has its termination in the Boise River about two miles below



I N D I A N C R E E K
Canyon County, Idaho

Stream Pollution Survey, 1958-59
Idaho Department of Health

Fig. 1

Caldwell. However, during irrigation season, nearly all of the stream is diverted into what is then called the Riverside Canal. This water is used by the Riverside Irrigation District south of Parma.

In addition to its use as a drain ditch, a waterfowl refuge, a fishing stream and an irrigation supply, Indian Creek is used as a waste carrier for numerous industries, among which are two meat packing plants, two custom slaughtering plants, one food processing plant, a municipal sewage treatment plant and a sugar factory. Also numerous individual septic tank overflows and feed lots drain into the creek.

The creek flows through Nampa's northeastern residential section and directly through the City of Caldwell. The good velocity of the stream aids in its recovery and keeps this pollution problem from being even more pronounced.

Waste Loading to the Stream

Other than the pollution load placed upon the stream by irrigation run off and stockyard drainage, the individual contributors who discharge wastes to the stream are listed as follows:

King Packing Company

Armour and Company has a slaughtering and packing plant located about one and one-half mile southeast of Nampa on Indian Creek. The wastes from this plant consist of paunch manure, wash water from the kill floor and other processing rooms, and the overflow from the septic tank which is used for disposal of the plant's domestic sewage. The blood is collected and dried at the plant. Grease skimmers catch most of the grease in the wash water. The combined wastes amount to approximately 150,000 gallons per day.

The plant processes from 125 to 160 head of cattle per day, five days a week, and approximately 100 head of sheep per week.

The plant, at the present time, is attempting treatment of these wastes with stabilization ponds.

Ben Anketell Slaughterhouse

This packing plant, which is located immediately downstream from King's, is quite small. The blood and wash water are wasted to the creek; whereas, the paunch manure and offal are collected and buried. A maximum of twenty head of cattle, along with a few hogs, are slaughtered each week.

General Foods Corporation

A Birds Eye frozen food plant is located next to the creek in the northern section of Nampa. This plant operates only seven weeks of the year -- two weeks in the early summer processing spinach and five weeks in late summer processing lima beans. Approximately 150 tons of beans per day are processed during two ten-hour shifts. Approximately 1,000 gallons of water per minute are used in the plant, and practically all of this water is discharged to the creek. This water is used mainly in the washing and blanching of the vegetables. The plant has four blanchers and each is dumped four times a day. All of the waste water is passed through 20-mesh screens before being discharged to the creek. The screenings are used for animal feed. The domestic sewage is disposed through a septic tank and field drain.

City of Nampa

The creek receives the treated effluent from the City of Nampa's sewage treatment plant which is located about one-half mile northwest of the city. The plant treats an annual average of four million gallons of raw sewage per day. The plant provides complete treatment which

involves primary settling and secondary treatment consisting of trickling filters and chlorination of the effluent. In summer, this loading increases greatly because of infiltration of ground water. At times, the flow is so great that some of the raw sewage is bypassed directly to the creek, while the rest receives only primary treatment.

Amalgamated Sugar Company

The Amalgamated Sugar Company has a beet sugar factory and beet pulp drier northwest of Nampa. The plant processes approximately 4,300 tons of sugar beets per day for a campaign of about 160 days. The plant operates 24 hours a day with about one hundred employees on each shift. About 6,000 gallons of fresh water per minute are used in the plant. Indian Creek receives about five million gallons per day of flume and wash water and considerable drainage from the lime settling ponds. The effluent from the plant's septic tanks also discharges into the creek. The waste water from the pulp screens and dewatering presses is discharged into Mason Creek which flows into the Boise River above Caldwell.

H. H. Keim Company

The H. H. Keim meat packing plant is located about two miles northwest of Nampa. This plant is located next to the stream and there are livestock pens on both banks. Approximately 325 head of cattle and calves and 80 hogs are processed each week. The paunch manure, blood and wash water are discharged directly into the creek without any treatment. The domestic sewage from the plant is disposed to a septic tank, the effluent of which is discharged to the creek.

Stockyards and Feed Lots

There is a considerable amount of drainage from various stockyards and feed lots along the creek, especially during rainy periods. This presents a bacteriological as well as an organic loading problem.

Johnson Brothers Custom Slaughtering

About two miles below Caldwell is the Johnson Brothers Custom Slaughtering plant which discharges all blood, wash water and paunch manure to the creek. This plant is fairly small, with a maximum weekly kill of fifty cattle. The plant is about one-half mile below the Riverside Canal diversion and one-half mile above the Indian Creek-Boise River junction.

J. R. Simplot Company

A J. R. Simplot food processing plant is located about two miles west of Caldwell on Highway 19. Asparagus, sweet corn and potatoes are processed at this plant. The waste water is discharged into a small drainage ditch that runs west along Highway 19 for two miles until it empties into a large drain ditch which in turn flows into the Riverside Canal. Potatoes are processed from September to May, and the principal wastes from this process are wash water and waste water from the caustic peeler. Sweet corn is processed during a four-week period in August and September, and wastes from this process are wash water and blancher waste water. Asparagus is processed for about two weeks during April and May, and the wastes are similar to those of sweet corn. The plant employs several hundred people who work on three shifts. The domestic sewage is treated in septic tanks, the overflows of which are discharged to the small drain ditch. The Simplot Company is now attempting treatment of its liquid wastes with a stabilization pond. The effluent from the pond will be discharged into the Boise River.

HMP Custom Slaughtering

A small custom slaughterhouse, operated by Mr. Ben Huston, is located about four miles west of Caldwell on Highway 19. All liquid wastes from this plant are discharged into a septic tank, the overflow from which flows into the small drain along Highway 19. Approximately 50 mixed animals are slaughtered each month.

United Meat Company

The United Custom slaughtering plant is located about five miles west of Caldwell on Highway 19. Approximately 60 hogs and 40 head of cattle are slaughtered each month. The blood and all liquid wastes are discharged to three septic tanks, the overflows from which are discharged into the West End Drain.

Table I

Indian Creek Stream Survey
1958 - 1959

Organic Waste Load Discharged to Indian Creek

Contributor	Type and Amount of Waste and/or Product	Est. Lb. BOD/day in Raw Waste	Type of Treatment	Est. lb. BOD/day Treated Wastes	Population Equivalent
King Packing Co.	120,000 lb/day (mostly cattle) domestic sewage (200 employees)	1500 34	lagoon septic tank	* 80 25	470 150
Ben Anketell Slaughterhouse	2720 lb/day (cattle & hogs)	40	paunch and offal are buried	40	225
General Foods (Birds Eye)	1,000gpm waste water -- 150/tons/ day beans	5380	20-mesh screen	5,380	31,620
City of Nampa sewage treatment plant	4 mgd raw sewage (annual average) 34,000 P.E.	5780	primary and secondary	695	4,100
Amalgamated Sugar Company	Approx. 5 mgd flume & wash water lime pond overflow domestic sewage (300 employees) 4300 ton/day--beets	19,000 50	screens and settling pond - lime slurry septic tank	12,940 40	76,000 225
H.H. Keim Co.	36,600 lb/day (mixed animals) domestic sewage (75 employees)	540 12	none septic tank	540 9	3,180 55
Johnson Brothers Custom Pack	6,000 lb/day (cattle)	86	none	86	500
J.R. Simplot Company	4,000 gpm potato & corn wastes Domestic sewage	44,400 170	lagoon septic tank	slight** 125	0 750
HMP Custom Slaughtering	1500 lb/day	20	septic tank	15	85
United Meat Co.	2200 lb/day (cattle & hogs)	33	septic tanks	25	140
Total		76,645		20,000	117,500

* population equivalent at time of survey was 8830
** population equivalent at time of survey was 260,000

Physical Observations

The general appearance of Indian Creek above Nampa did not seem to change much throughout the year. However, from King Packing Company to the Boise River, the wastes discharged into the creek showed a very marked degradation of the stream.

The stream at sampling station 1, (see Fig. 1) was in very good condition at nearly all times during the year, the only exception being the period when early irrigation runoff carried silt into the stream. At other times, the stream was clear with a rocky and sandy bottom.

At stations 2 and 3, paunch manure and meat scraps were noted floating in the stream. At times, the stream was even reddish in color from the blood wastes. The bottom and sides of the creek were coated with black sludge deposits. A great deal of rat activity also was noted along the banks.

At station 4, Indian Creek was in poor condition, especially during the fall and winter months. During this time, due to the sugar factory wastes, the stream was a chalky brown color and very turbid with silt, lime pond drainage and minute organic particles. This turbidity persisted in the stream to the Boise River, and there was much slime growth and sludge noted. During the summer months at this station, the stream cleared to some extent and was similar to station 2 in appearance. Meat scraps, paunch manure and blood coloring were noted in the creek below Keims. Large amounts of slime growth were also noted below the Birds Eye frozen food plant while it was in operation. At times during the fall and winter months, disagreeable odors were detected at the sampling stations below the Amalgamated sugar factory because of the heavy load of organic wastes discharged to the creek. During the summer months when one would normally expect the odors to be more pronounced, none were detected.

The West End Drain, which feeds the Riverside Canal, definitely showed the affect of the wastes discharged to the drain from the Simplot food processing plant. Great amounts of slime growth were noted floating and growing in the ditch and in the canal. The banks and bottoms of these streams were covered with a black foul-smelling sludge. This sludge resulted from the decay of this slime and other organic material discharged to the streams.

This slime growth in the Riverside Canal causes a nuisance to the farmers who use this water for irrigation purposes. The slime plugs irrigation equipment, slows the flow of water in the small ditches and fields. The decaying sludge may be harmful to the soil and also results in offensive odors. Another factor is the possible health hazard involved by using this water which has come from streams into which raw sewage and inadequately treated sewage effluents have been discharged.

Because of the large waste load that is discharged to Indian Creek and Riverside Canal, the stream has little chance for significant recovery by the time it reaches the Boise River. This loading, therefore, has a very marked effect upon the Boise River which at times during the winter has a flow not much greater than Indian Creek. From the mouth of Indian Creek to the Snake River, the Boise River is in very poor condition except during the summer. A great abundance of slime, silt and other organic matter makes the river appear very turbid and trashy. Large banks of sludge were noted along the bottom and sides of the river. In places, the sludge was eighteen inches thick and had quite an offensive odor.

Indian Creek flows at about two feet per second at Station 1, and about four feet per second below Caldwell. This rapid flow enables the stream to carry along much of the wastes which would settle out in a slower moving stream. This results in the Boise River receiving wastes which have not started decomposition. The creek's flow above Nampa will vary somewhat with the seasons, but of more significance is the flow in the drain ditches that feed the creek; for instance, above King's plant in December the flow was approximately thirty cubic feet per second, while below Caldwell the flow was approximately two hundred cubic feet per second.

Wilson Drain is the largest feeder, which at times has more volume than the creek. This drain has a large flow all year and aids in the dilution of Indian Creek before it reaches Caldwell. Wilson Drain receives no large pollution load except the silt and organic material from irrigation runoff.

The temperature of the stream was somewhat influenced by the atmospheric temperature. As an example, in August with air temperatures around 95 degrees Fahrenheit most of the day, the temperature of the stream increased from 64 degrees Fahrenheit at King's to 72 degrees at Station 5, a distance of about six miles. Also, the temperature of wastes entering the stream had quite an effect on the temperature of the creek. On a cold rainy day in February with the air temperature near 40 degrees Fahrenheit, the temperature of the stream increased from 45 degrees Fahrenheit above the sugar plant to 57 degrees Fahrenheit downstream from the plant's outfall.

PHYSICAL, CHEMICAL AND BIO-CHEMICAL ANALYTICAL RESULTS

Water samples were collected at each of the various sampling stations during the survey. These samples were taken by a prescribed procedure and handled with analytical care. A summary of the results from these samples is shown in Tables No. II through V.

Physical

The samples taken during the August survey showed that the stream did not vary much in total solids from above Nampa to Caldwell, and it increased only slightly in the Riverside Canal. However, the samples taken during December and February showed quite a change in total solids. In December, above King's the total solids was about 700 parts per million, while at Station 4 total solids were 2,000 ppm. The suspended solids increased proportionately from 50 parts per million to 1,250 parts per million. Therefore, the increase in total solids is caused by the increase in suspended solids which indicates organic waste material of some sort entering the stream. The difference between the total solids and suspended solids would be mostly the dissolved solids.

Chemical

The dissolved oxygen (D.O.) in the stream varied considerably from station to station during each survey (see Fig. No. 2 and Tables No. II, III and IV. The amount of dissolved oxygen in a stream is a good indication as to the effect that the pollution load is having upon the stream. Most fish life needs at least four parts per million dissolved oxygen and streams will become septic with a dissolved oxygen concentration of 2.5 parts per million or less. During each survey, the D.O. at Station 1, the control station, was at or near the saturation point. The saturation point varies directly with the temperature of the stream and for Indian Creek it will vary from 9 to 13 parts per million D. O.

In August, the D.O. of the stream dropped from 8.4 ppm., at Station 1, to a low of 3.0 ppm., at Station 4, and recovered to 7.3 ppm., at Station 6. At Station 7, in the Riverside Canal (Indian Creek) the D.O. had increased to 10.8 ppm., then with the junction of West End Drain which had a D.O. of 5.6, the D.O. of the canal dropped and still had only a D.O. of 5.7 ppm., at Parma. If it were not for the fact that the stream has a good reaeration rate, due to its rapid flow, it undoubtedly would be septic along much of its course during the summer.

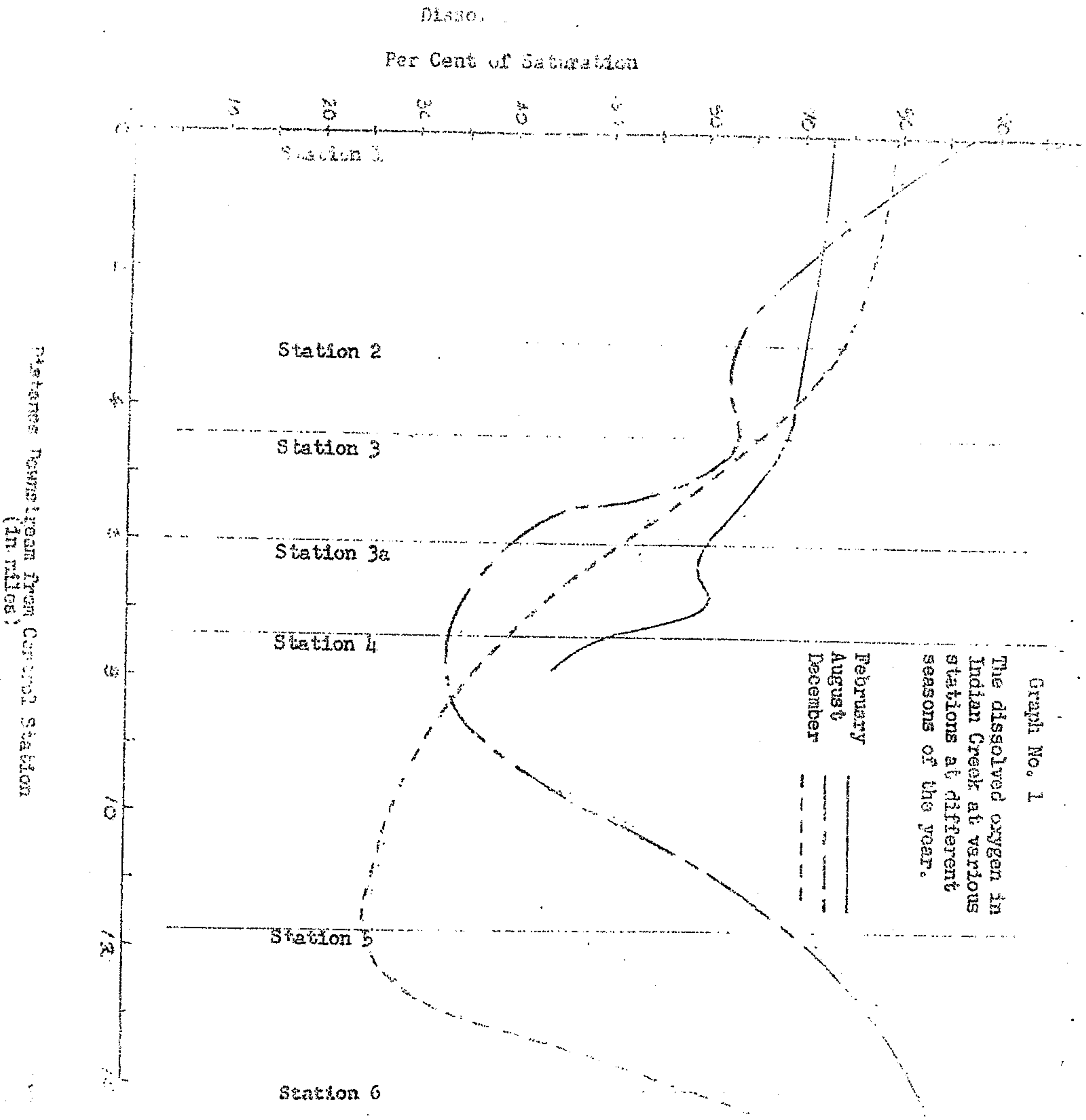
In December, the D. O. at the control station was 9.1 ppm., while at Station 4, it was 4.5 ppm., and at Station 5, it was down to 2.5 ppm., with definite septic conditions. At Station 6, the D.O. was 6.5 ppm. The results of the samples collected in February were similar to these results.

Biochemical

The amount of dissolved oxygen required for satisfactory oxidation of organic material, such as domestic sewage and industrial wastes, is called the biochemical oxygen demand or B.O.D. This is, therefore, a very important test in determining the degree of organic pollution in a stream. The quantity of B.O.D. is also used to determine the population equivalent of wastes (See Table I). The samples collected during August showed a B.O.D. of 3 at Station 1, and a maximum of 14 occurring at Station 2, and also in the canal at Parma. This B.O.D., although comparatively low, was enough to considerably lower the dissolved oxygen in the stream.

In December, the B.O.D. at Station 1 was still 3 parts per million; however, at Station 4, the B.O.D. was up to 100 parts per million. This

large increase in the pollution load of Indian Creek at this point is due to wastes discharged to the creek from the sugar factory. At Station 6, the stream still had a B.O.D. of about 20 parts per million. The results of the samples collected in February were relatively the same as those in December. The results of the tests for the five-day B.O.D., at the various stations at different times of the year clearly show the effects of the wastes discharged to Indian Creek. (See Fig. 3).


Disso.
Per Cent of Saturation
20
30
40
50
70
Station 1
Station 2
Station 3
Station 3a
Station 4
Station 5
Station 6
10
Graph No. 1
The dissolved oxygen in Indian Creek at various stations at different seasons of the year.
February
August
December
Distance Downstream from Control Station (in miles)

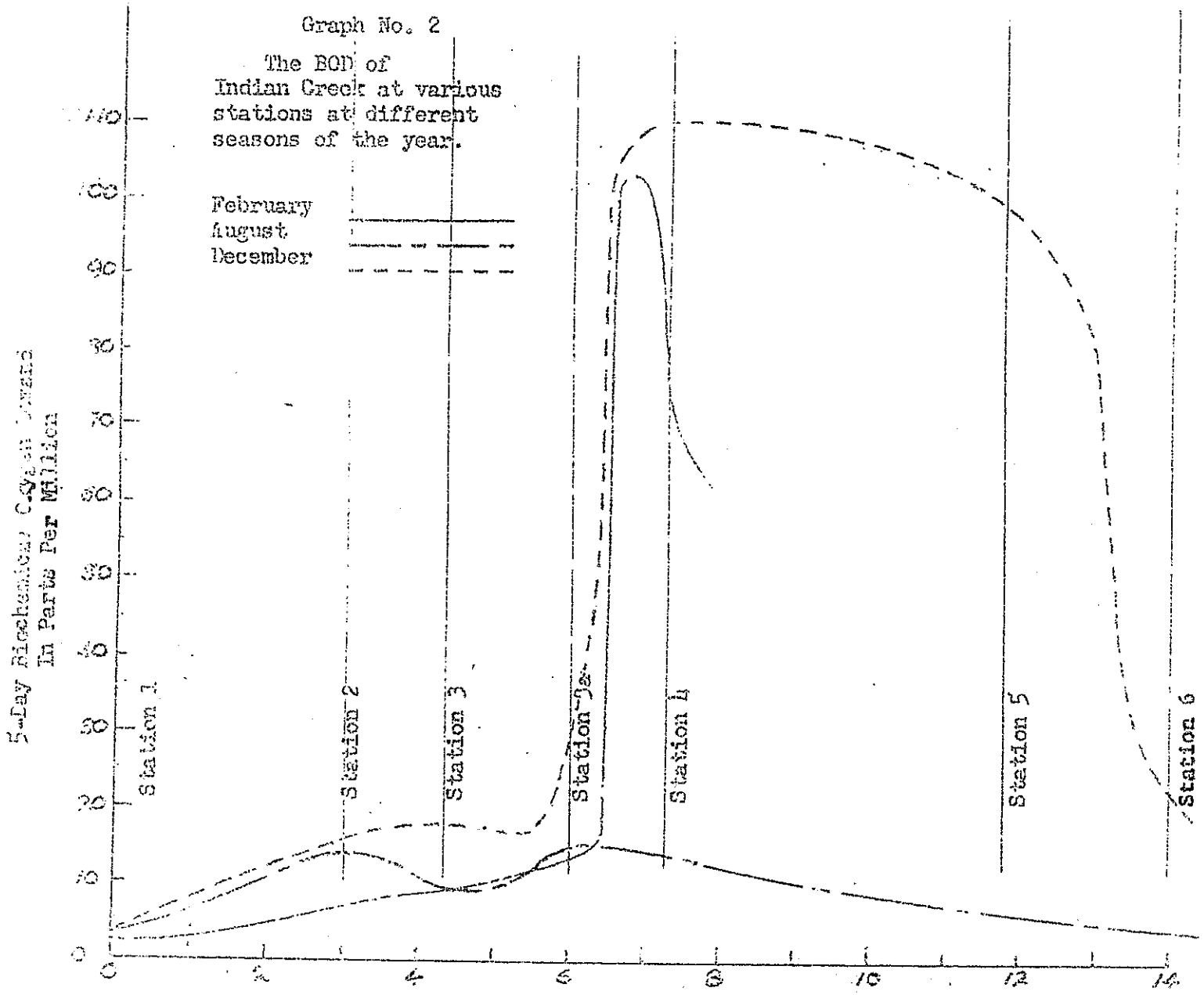


Fig. 3

INDIAN CREEK
STREAM SURVEY
1958

Table II

Indian Creek Stream Survey

Results of Analytical Determinations
February 4 and 12, 1958

Stations	1	2	3	3b *	3c**	4
Temp. °F		45	46		58	57
pH	8.2	7.5	7.5	7.6	7.3	7.5
D.O.		8.6	8.2	7.0	6.4	5.3
BOD	2.5	7.0	9.0	15.0	103	75
Total solids	601	698	674		1166	
Susp. Solids	15	16	31		222	
Turbidity	32	40	95		550	
Alkalinity (as $CaCO_3$)	270	276	282		300	

* Station 3b is below Nampa sewage treatment plant.
** Station 3c is below sugar plant outlet

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Table III

Results of Analytical Determinations
August 7 - 12, 1958

Stations	1	2	3	3a	4	5	6	P*
Temp. °F	64	65	66	72	70	71	72	69
pH	7.6	7.6	7.5	7.5	7.5	7.7	7.9	7.5
D.O.(ppm)	8.4	5.9	6.0	3.5	3.0	6.2	7.3	5.7
BOD (ppm)	3	14	9	14	13	6	4	14
Total Solids (ppm)	458	498			506	524	542	408
Turbidity (ppm)	4.5	8.6			8.2	16	24	
Alkalinity(ppm)	234	244			246	226	248	
Hardness (ppm)	196	206			192	168	190	
Sodium (ppm)	80	85			91	89	92	
Ammonia (ppm)	0	1.25			1.50	0.75	0.25	
Flow Rate (cfs)	45	50	66	70	100	150	300	

* Riverside Canal at Parma

Table IV

Indian Creek Stream Survey

Results of Analytical Determinations
December 2, 1958

Stations	1	2	3	4	5	6
Temperature °F	49	51		60	57	53
pH	7.8	7.8		8.7	8.4	8.1
D.O.	9.1	8.3	7.2	4.5	2.5	6.5
B.O.D.	3	16		110	100	22
Total Solids	684	656		1870	1900	967
Suspended Solids	42	34		1260	1225	335
Flow Rate (cfs)	25	30		55	65	150

BACTERIOLOGICAL ANALYSES

In addition to other water samples, special samples were collected at the various stations for bacteriological analyses. Calculated volumes of these samples were filtered through what is called a membrane filter. The holes in the filter are so small that bacteria are actually caught on the surface of the filter paper. A nutrient dye is applied to the filter paper and incubated for a specified length of time. At the end of this period, the individual colonies of bacteria can be counted. The colonies which are counted belong to the coliform group of bacteria, which is an indicator of domestic sewage pollution.

From a health standpoint, the bacteriological contamination of a stream is the most serious problem. However, the overloading of a stream with organic wastes many times increases the health hazard involved. The principal way is by furnishing the bacteria nutrients with which they can continue to live and reproduce. The bacteriological count in a stream may double in just a few miles if there is enough organic waste in the stream and if the temperature of the water is not too low. The bacteriological count at Station 1 was less than 700 organisms per 100 milliliters during all of the surveys, but counts as high as 400,000 were obtained at various stations throughout the study. (See Table V)

In February, 1958, the count was 200 at Station 1, approximately 240,000 below the Nampa sewage treatment plant and 400,000 at Station 4. This extremely high coliform count below the Nampa sewage treatment plant would be due to the fact that the city was not chlorinating its plant effluent at the time of the February survey. In December, 1958, the count was 37,500 at Station 4, and 117,000 in Caldwell. Riverside Canal still had

a count of 60,000 organisms per 100 milliliters as far down as Parma during an August survey. This remained high because of the bacteria introduced into the West End Drain by the Simplot plant.

These high coliform counts indicate a definite health hazard to anyone who comes in contact with this water. This may happen to persons swimming or fishing in the stream or using the water for irrigation. Pets that come in contact with the water could transmit micro-organisms to humans. This public health hazard is even more significant due to the fact that Indian Creek flows directly through the Cities of Nampa and Caldwell.

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Table V

Indian Creek Stream Survey

Results of Bacteriological Analyses

Station	February, 1958	August, 1958	December, 1958	January, 1959
1	200		570	600
2	21,000		260	13,000
3	12,000		7,690	2,000
3b	241,700			4,000
3c				150,000
4	400,000		37,500	330,000
5			10,770	92,000
6		28,000	117,400	180,000
P		60,000		

BIOLOGICAL ASPECTS

Samples of animal life were taken at various stations in Indian Creek and some general observations were made regarding plant and animal life. These samples were collected from the bottom of the stream with a double-handled, 16-mesh screen, 3 feet by 4 feet and/or an Eckman dredge.

It is known that the ability of aquatic animals to survive depends on many environmental conditions and the physical makeup of the animal in reacting to these conditions. One animal may live and thrive in clean water at the right temperature, with the proper amount of sunlight, plenty of dissolved oxygen, sufficient food, with no toxic chemicals or excess silt present, not too many predators, without too much organic material present and other factors that the animal may need or have to cope with to survive. Another different species of aquatic animal may be able to withstand or be tolerant of a wider range of these factors. It may actually thrive under polluted conditions and be unable to exist, or at least thrive, in clean water. These two examples are extremes in reaction of aquatic organisms to different water conditions since there are many intermediate positions of tolerance by aquatic animals. It can be determined, with some accuracy, whether a stream is polluted by obtaining biological samples from the stream above the area of suspected pollution and a short distance down stream from this area. Any variations in the different kinds present between the two sample stations and the difference in abundance of the organisms may indicate the presence of pollutants.

One of the chief values of relating aquatic animals to stream pollution is that the developmental cycles of these organisms extend over periods of time such that a sample may indicate the condition of the

stream for the preceding months or longer. For example, a water sample taken on a particular day may have a high dissolved oxygen content and hardly any organic matter merely because the pollutant was not being discharged into the stream when the sample was taken. A bottom sample, however, may include pollution tolerant and no pollution intolerant organisms if persistent and frequent pollution is present, although not continuous.

Biological samples were taken in Indian Creek. Table VI indicates the number of different groups of organisms found and their status from a pollution standpoint. Table VII was prepared to show the relative effects of pollution on Indian Creek. The "clean water rating" is an artificial rating used to compare the findings at each station. Two conditions generally consistent with regard to bottom organisms in relation to pollution are: (1) Clean water will have many different kinds of organisms without necessarily having tremendous numbers of any one kind. (2) Polluted water will have fewer kinds of organisms but often many individuals of the kinds present. The most significant organisms are those that are very sensitive to pollution.

The rating indicated in Table VII was determined by finding the percentage of different kinds of pollution intolerant organisms in the sample. It will be noted that a certain amount of recovery in the stream was found at Stations 2, 3 and 5, during August. Dilution water from irrigation, the absence of certain contaminants and the season of greatest animal activity would account for this variation. Where no specimens were found, the condition of the stream was very poor, due primarily to a heavy organic load.

According to the evidence of the survey, there are definite pollution effects at Stations 2 through 5. These are the stations below the various points where contaminants are introduced into the stream.

Table VI

Indian Creek Stream Survey

Pollution-Tolerant and Pollution-Intolerant
Organisms Found in Indian Creek
February through December, 1958

Organisms found that are known to be pollution tolerant:*

1. Segmented worms of the class Oligochaeta.
2. Snails of the genus Physa.
3. Bloodworms of the family Tendipedidae.
4. Leeches of the class Hirudinea.
5. Biting flies of the family Heleidae.
6. Beetles of the family Hydrophilidae.

Organisms found that are known to be pollution-intolerant:

1. Green and brown midge larvae of the family Tendipedidae.
2. Mayflies of the order Ephemeroptera.
3. Crustaceans of the class Amphipoda.
4. Clams of the class Pelecypoda.
5. Damselflies of the order Odonata.
6. Caddis flies of the order Trichoptera.
7. Horseflies of the order Diptera.

* Some of these organisms can survive in clean water and polluted water, depending on the degree of pollution and other factors.

Table VII

Indian Creek Stream Survey

Biological Comparison of Five Stations
February through December, 1958

Station Number	Date	Number of Different Organisms Found	Number * Pollution Tolerant	Number ** Pollution Intolerant	Clean Water Rating
1	Feb. 12, 1958	5	1	4	80
	Aug. 7, 1958	11	5	7	64
	Dec. 2, 1958	6	1	5	83
2	Feb. 12, 1958	1	1	0	0
	Aug. 7, 1958	6	4	2	33
	Dec. 2, 1958	1	1	0	0
3	Feb. 12, 1958	4	4	0	0
	Aug. 7, 1958	6	4	2	33
	---	--	--	--	--
4	Feb. 12, 1958	0	0	0	0
	Aug. 7, 1958	4	4	0	0
	Dec. 2, 1958	1	1	0	0
5	Feb. 12, 1958	0	0	0	0
	Aug. 7, 1958	8	3	5	63
	Dec. 2, 1958	2	2	0	0

* This includes those able to withstand pollution and those that can live in both polluted or clean water.

** This includes those that are very sensitive to pollution.

CONCLUSIONS

The following conclusions are drawn from observations at various Indian Creek sampling stations at different seasons, from evaluations of wastes being discharged to the stream and from analytical results of samples taken.

1. Conditions definitely showed the effect of wastes being discharged into Indian Creek. The physical, chemical, biochemical, biological and bacteriological examinationsof samples collected at Station 1 showed a clean water practically free of pollution. The wastes discharged by King's Packing Company before treatment was started definitely degraded the stream. This was evidenced by a decrease in the dissolved oxygen content, an increase in the 5-day B.O.D. content, an increase in the coliform bacteria count and the appearance of paunch manure and meat scraps in the stream. Partial recovery is obtained by the time the water reaches the Birdseye Frozen Food plant in the summer and the Amalgamated sugar factory in the fall and winter. Due to the volume and high strength of the liquid wastes being discharged by the Birdseye plant while it is in operation, the stream is again degraded with a decrease of dissolved oxygen and an increase of 5-day B.O.D. During the winter and fall, the wastes discharged to the stream by the Amalgamated Sugar Company degrade the stream to such an extent that it not only fails to recover before reaching the Boise River but causes a definite degrading of the river. This is shown by the high B.O.D., the coliform bacteria count and the extreme lowering of dissolved oxygen content all along the creek below the sugar plant.

The wastes discharged to Indian Creek by the Keim packing plant are of such volume and strength that the stream is definitely degraded.

2. The main problems created by the discharge of the various untreated and partially treated wastes to Indian Creek are as follows:

   a. The odors created by the anaerobic decomposition of wastes discharged to the stream.

   b. The odors created by the decaying of slime growth which had formed because of the large amount of nutrients in the stream.

   c. The health hazard created by the discharge of partially treated domestic sewage from the food and meat plants, from individual homes, and from the Nampa sewage treatment plant when it is overloaded during the summer months and when the plant's treated effluent is not properly disinfected.

   d. The wastes discharged to the creek interfere with the propagation of fish and wildlife.

   e. Since Indian Creek discharges into the Boise River and, therefore, into the Snake River, the wastes discharged to the creek have an effect on water uses of the Snake River. The main problem encountered here would be the effect on domestic water use. Wastes discharged to Indian Creek promote algae and other aquatic growths in the Snake River, which in turn cause difficulties in the treatment of water for domestic use.

f. Since much of Indian Creek is used for irrigation purposes, the wastes discharged to the stream create a health hazard and cause nuisance conditions in irrigation use.

g. The deterioration in quality of water used for livestock watering.

h. The wastes discharged to the creek encourage rat propagation in the area. The wastes provide food for the rats and, since they already have an adequate water supply and harborage, an ideal habitat is created.

i. Oily wastes discharged into Indian Creek by the Union Pacific Railroad servicing yards in Nampa further deteriorates the water for agricultural and domestic use.

RECOMMENDATIONS

King Packing Company

1. There should be effective treatment of the screened waste water to reduce the 5-day B.O.D. by approximately 90 per cent. This could be accomplished by either redesign of the lagoons, used about five months during the summer of 1959, or mechanical treatment, to provide trouble-free operation.
2. In handling the plant's domestic sewage, the septic tank effluent should either be disposed in an underground absorption system or adequately chlorinated before being discharged to the stream.

Ben Anketell Slaughterhouse

1. Primary and secondary treatment should be provided for the waste water discharged to the creek.
2. Blood from the kill floor should be collected and disposed in a sanitary manner.

General Foods Corporation (Birds Eye frozen food plant)

1. The feasibility of pretreating and discharging the plant's wastes into the city sewer system should be investigated.
2. If this is not feasible, the wastes should receive treatment equivalent to that obtained in a primary and secondary domestic sewage treatment plant. This type of treatment reduces the biochemical oxygen demand by 85 to 90 per cent.

City of Nampa

1. Emphasis should be placed upon carrying out an effective program for reducing the infiltration of seepage water into the city sewers. This will provide more effective treatment of sewage.
2. Adequate chlorination of the plant's effluent should be maintained at all times.

City of Nampa - continued

3. Steps should be taken within the city to eliminate individual septic tanks which discharge into Indian Creek.

Union Pacific Railroad

1. Equipment should be installed to prevent discharge of any oily wastes to Indian Creek.

Amalgamated Sugar Company

1. There should be effective removal of settleable and floatable solids from flume and wash water.
2. Close observation and maintenance of the lime pond should be kept in order to prevent any overflow from entering the creek.
3. The effluent from the plant's septic tanks should be adequately chlorinated before being discharged to the creek.

The above-mentioned recommendations concern only those wastes presently being discharged into Indian Creek.

H. H. Keim Company

1. Blood from the kill floor should be collected and disposed in a sanitary manner.
2. Paunch manure should also be collected separately and disposed in a sanitary manner.
3. There should be effective treatment of the wash water and other liquid wastes to reduce the 5-day biochemical oxygen demand by approximately 90 per cent.
4. The effluent from the plant's septic tank should be disposed in an underground absorption system or adequately chlorinated before being discharged into the creek.

City of Caldwell

1. The city should take steps, within the city, to eliminate individual sewage disposal systems which discharge partially treated wastes into the creek.

Johnson Brothers Custom Slaughtering

1. Blood from the kill floor should be collected separately and disposed in a sanitary manner.
2. Paunch manure should also be collected separately and disposed in a sanitary manner.
3. The equivalent of primary and secondary treatment should be provided for the waste water discharged to the creek.
4. Septic tank effluent should be disposed in an underground absorption system or adequately chlorinated if discharged into the creek.

J. R. Simplot Company

1. The effluent from the plant's septic tanks should be adequately chlorinated before being discharged into the drain ditch. No recommendations regarding the plant's industrial wastes will be included in this report since the wastes are presently being discharged to another drainage course.

HMP Custom Slaughtering Plant

1. The blood from the kill floor should be collected and disposed in a sanitary manner.
2. The equivalent of primary and secondary treatment should be provided for the waste water discharged to the creek.

United Meat Company

1. The blood from the kill floor should be collected and disposed in a sanitary manner.
2. The equivalent of primary and secondary treatment should be provided for the waste water discharged to the drain ditch.

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GENERAL RECOMMENDATIONS

1. The stockyards and feed lots along Indian Creek should be fenced so that the animals do not have free access to the stream, except at watering runs. An effort should be made also to eliminate the surface drainage of these pens into the creek.
2. A program for eliminating the discharge of overflows from individual septic tanks into Indian Creek should be carried out. Suitable soil absorption systems or additional treatment should be provided for these wastes.