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TREATMENT AND DISPOSAL OF SUGARBEET PROCESSING WASTE WATER BY IRRIGATION

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ABSTRACT

Irrigation with sugarbeet processing waste water was studied at three locations for 2 or 3 years where perennial grass and alfalfa were irrigated by flooding specially graded fields. Experimental sites were scheduled for irrigation at intervals of 1, 2, or 4 weeks. This schedule was maintained for the first year until the weekly irrigated plots were discontinued because of excessive loading. Waste water was sampled twice weekly from the sugar factories, and water samples were extracted from the soil at depths of from 15 to 150 cm each time the fields were irrigated. All water samples were analyzed for chemical oxygen demand, total nitrogen, phosphorus, potassium, electrical conductivity, calcium, magnesium, sodium, sodium absorption ratio, pH, chlorine, sulfate, and bicarbonate. Soil and plants were also analyzed for selected constituents. N applications to the experimental plots ranged from 280 to 4200 kg/ha and, on the fields, from 277 to 1425 kg/ha. P applications ranged from 5 to 50 kg/ha on the experimental plots and from 11 to 43 kg/ha on the fields. K applications ranged from 195 to 6350 kg/ha on the experimental plots and from 490 to 3410 kg/ha on the fields. Water applications ranged from 28 to 201 cm/year, and COD applications ranged from 8 to 140 metric tons/ha. COD reduction in the waste water at Twin Falls averaged 48 percent in winter and 98 percent in summer; at Rupert, it averaged 84 percent in winter and 98 percent in summer; and at Nampa, it averaged 75 percent in winter and 88 percent in summer. Nitrates found in water samples extracted from 150 cm in the soil were mostly below 10 parts per million N with a few samples higher. Irrigation with sugarbeet processing waste water works well in the field.

KEYWORDS: Chemical oxygen demand, nitrate, phosphorus, potassium, calcium, magnesium, sodium, sodium absorption ratio, electrical conductivity, pH, pollution control, waste water irrigation.

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GLOSSARY

Anerobiosis ... Without air or without oxygen.

Anions ... Negatively charged ions.

Cation exchange capacity ... The sum total of exchangeable cations (positively charged ions) that a soil can absorb.

Clay-size fraction ... A soil separate consisting of particles less than 0.002 mm diameter.

Dentrification ... The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Electrical conductivity ... The measurement of a solution's capacity to conduct electricity. In soils and water, the electrical conductivity is a measurement of the total concentration of soluble salts.

Flood irrigation ... Irrigating soils by means of surface application of water in furrows or basins.

Graded fields ... Fields that have been mechanically smoothed to a particular grade or slope.

Land disposal ... Disposing of waste materials on land.

Leaching ... The removal of materials in solution from the soil.

Loading ... The amount of organic matter, water, and nutrients applied to land in waste water. *See* Nutrient loading.

Nutrient loading ... The amount of plant nutrients applied to soil in wastes, either solid or liquid.

Oxygen demand ... The oxygen required to chemically or biologically oxidize a particular material.

Particle size analysis ... Determination of the various amounts of the different separates in a soil sample.

Primary treatment ... The first treatment of waste water, which usually consists of settling or screening out particulate material.

Processing plant waste effluent ... Waste water discharged from a food processing plant.

Saline ... A nonsodic (nonsodium) soil containing sufficient soluble salts to impair its productivity.

Secondary treatment ... Additional treatment of primary treated waste water to remove dissolved organic constituents, usually by biological oxidation.

Steffen's waste ... The filtrate obtained from the precipitation of calcium sucrate in the Steffen process of recovering sugar from sugarbeet molasses.

Total Kjeldahl nitrogen (TKN) ... The nitrogen content of a material that is analyzed by a Kjeldahl method.

TREATMENT AND DISPOSAL OF SUGARBEET PROCESSING WASTE WATER BY IRRIGATION

By J.H. Smith and C.W. Hayden[1]

INTRODUCTION

In recent years, irrigating agricultural land with waste water has increased until it is now a major method of waste water management. This method of waste water utilization has replaced much of the discharge to streams and conventional treatment in primary and secondary waste treatment systems for food processing waste water (*4, 5, 10, 13, 14, 15, 17, 20, 32*).[2] Most food processing waste water can be used for irrigating agricultural land because it seldom contains toxic constituents. Crops grown on the land remove part of the plant nutrients supplied by the waste water and can be fed to livestock(*1, 2*).

Considerable data have been published on waste water irrigation in recent years, and several food processing waste waters have been evaluated for irrigation use. Smith and associates published nutrient contents of potato processing waste water (*23, 25*), water loading, organic loading, reduction of chemical oxygen demand (COD) and nitrates in soil (*22, 27*), denitrification in potato processing waste treatment fields (*24, 26*), and decomposition in soils of cooking oils used in potato processing (*21*).

De Haan and associates (*6, 7*) reported research results from The Netherlands on land disposal of potato starch waste water. They concluded that the system works well, that oxygen demand and the chemical constituents except potassium were satisfactorily removed at moderate applications as waste water passed through the soil, and that using waste water for irrigation could economically benefit the farmers.

Nutrient concentrations in waste water and, in some cases, feasibility for irrigation use have been evaluated for several food processing waste waters: cannery wastes (*9, 19*), citrus wastes (*12*), vegetable wastes (*16, 28, 29, 30*), fruit processing wastes (*18, 28, 29, 32*), and grain wastes (*29*). For the most part, these waste waters can be used for irrigating agricultural land with a minimum of problems.

Sugarbeet processors discharge large volumes of waste water that contain relatively low concentrations of organic matter, suspended solids, and various inorganic nutrients. Large amounts of nitrogen and organic matter can be applied to the fields because they are irrigated with large volumes of these waste waters.

The objectives of this paper are to summarize data for (1) flood irrigation with sugarbeet processing waste water; (2) loading with nutrients and organic matter; and (3) water cleanup through soil filtration and microbiological activity to evaluate some aspects of nutrient utilization to consider salinity and specific ions, and to discuss feasibility of continued irrigation with sugarbeet processing waste water.

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[2] Italic numbers in parentheses refer to Literature Cited, p. 10.

METHODS AND MATERIALS

This study was conducted at three Amalgamated Sugar Company plants located at Twin Falls, Rupert, and Nampa, Idaho, where the waste water is used to irrigate cropped fields. The waste water irrigation fields at the three plants were all designed and prepared for waste water irrigation by leveling to rigid specifications and diking the fields to prevent runoff. A slight grade was designed into each field to facilitate surface irrigation. The fields were seeded to a mixture of orchard grass *(Dactylis glomerata)* and alfalfa *(Medicago sativa)*, which was harvested for hay during the summer. Waste water was sampled at each sugarbeet processing plant twice weekly during the beet processing season. An automatic sampler delivered waste water into a freezer at designated intervals, where it was frozen in a plastic container for storage until it could be analyzed in the laboratory (*8*). At the Nampa sugarbeet processing plant, a water meter was used to actuate the sampler at preset volumes of water, sampling the waste water in proportion to the volume passing through the meter.

Waste water irrigations were scheduled at intervals of 1, 2, and 4 weeks at the Twin Falls and Rupert plants and at 2 and 4 weeks at the Nampa plant. The weekly irrigations were continued until January 1977 when they were stopped because of severe overloading of the plots. Soil water was sampled after each irrigation, using 3.8-cm-diameter, polyvinylchloride sampling tubes with porous ceramic cups cemented to one end. The sampling tubes were inserted vertically into the soil to depths of 15, 30, 60, 90, 120, and 150 cm at each sampling site. When taking samples, approximately 0.7-bar suction was applied to the tubes for about 48 hours. The extracted water was pumped into a suction flask, transferred to a plastic bottle, and taken to the laboratory for refrigerated storage until it was analyzed. Not every tube yielded a water sample at every sampling.

The water samples were analyzed for COD according to "Standard Methods for the Examination of Water and Waste Water" (*3*). Nitrate-nitrogen was determined with a nitrate-specific ion electrode. Total nitrogen was determined by a Kjeldahl procedure, modified by substituting copper for the mercury catalyst (*2*). Total phosphorus was determined by persulfate oxidation (*31*) and potassium, by flame photometry. Water applications to the fields were measured by the field operators using watermeters. Processing plant waste effluents, water samples extracted with extraction tubes, and saturated soil extracts were also analyzed for sodium by flame photometry. Calcium and magnesium were analyzed by atomic absorption spectrometry; chloride, by silver titration; sulfate, by precipitation as barium sulfate and read on a spectrophotometer; total dissolved salts, by electrical conductivity; and pH was taken. Soils sampled annually were analyzed for the above constituents by the methods listed above and for total organic matter by wet digestion. The first soil samples were analyzed for cation exchange capacity (CEC) and particle-size distribution from each sampling depth (table 1).

Plant samples were analyzed for NO_3^-, total N, P, and K as indicated above for water samples after appropriate digestion or extraction.

RESULTS AND DISCUSSION

Waste Effluent Analysis and Application

Waste water applications at the fields were initially at planned rates of 10 cm per irrigation and scheduled at 1-, 2-, or 4-week intervals. After the first irrigation season, we determined that the weekly irrigation was excessive and would damage the fields; therefore, the weekly application was eliminated, and these plots were thereafter irrigated at the schedule of waste water application to the entire field area. Schedules A, B, and C corresponded to the irrigation intervals of 1, 2, and 4 weeks, and the D schedule was as needed to dispose of the waste water on the remainder of the field. Applications varied from 28 to 169 cm per year at Twin Falls and Rupert and from 114 to 201 cm per year at Nampa for 2 years.

TABLE 1.—*Particle-size distribution and soil types at sugarbeet processing waste water treatment fields*

Location (plot No.)	Soil depth	Clay	Sand	Silt	Soil type
	Cm		*Percent*		
		TWIN FALLS			
(A)	0-15	23.2	20.3	56.5	Silt loam.
	15-30	22.7	21.3	56.0	Do.
	30-60	23.2	14.8	62.0	Do.
	60-90	17.8	18.2	64.0	Do.
	90-120	10.2	21.3	68.5	Do.
	120-150	10.2	22.8	67.0	Do.
(B)	0-15	20.4	19.1	60.5	Do.
	15-30	22.3	21.6	56.1	Do.
	30-60	22.8	20.7	56.5	Do.
	60-90	16.3	17.2	66.5	Do.
	90-120	11.8	19.7	68.5	Do.
	120-150	11.7	22.8	65.5	Do.
(C)	0-15	22.9	19.6	57.5	Do.
	15-30	22.3	19.7	58.0	Do.
	30-60	23.8	18.7	58.0	Do.
	60-90	20.4	16.8	62.8	Do.
	90-120	12.7	17.8	69.5	Do.
	120-150	10.2	19.8	70.0	Do.
		RUPERT			
(A)	0-15	15.8	59.5	24.7	Sandy loam.
	15-30	16.8	57.3	25.9	Do.
	30-60	24.8	44.8	30.4	Loam.
	60-90	26.8	35.6	37.6	Loam/clay loam.
	90-120	18.2	35.6	46.2	Loam.
	120-150	10.7	53.1	36.2	Sandy loam.
(B)	0-15	14.9	63.1	24.7	Do.
	15-30	15.4	63.6	25.9	Do.
	30-60	21.8	48.6	30.4	Loam.
	60-90	15.7	58.6	37.6	Sandy loam.
	90-120	24.8	16.6	46.2	Silt loam.
	120-150	22.7	29.6	36.2	Loam/silt loam.
(C)	0-15	16.9	55.6	27.5	Sandy loam.
	15-30	17.4	54.9	27.7	Do.
	30-60	22.4	44.6	33.0	Loam.
	60-90	19.3	55.1	25.6	Sandy loam.
	90-120	15.8	34.7	49.5	Loam/silt loam.
	120-150	18.2	34.3	47.5	Loam.
		NAMPA			
(B)	0-15	28.8	29.6	41.6	Clay loam/loam.
	15-30	19.2	33.2	47.6	Loam.
	30-60	17.4	36.4	46.2	Do.
	60-90	21.2	39.8	49.0	Do.
	90-120	12.2	53.8	34.0	Sandy loam.
	120-150	10.2	51.8	38.0	Sandy loam/loam.
(C)	0-15	15.2	43.8	41.0	Loam.
	15-30	18.2	41.8	40.0	Do.
	30-60	14.2	51.8	34.0	Sandy loam/loam.
	60-90	12.6	54.0	33.4	Sandy loam.
	90-120	9.4	58.4	32.2	Do.
	120-150	9.6	50.0	40.4	Loam.

The nitrogen (N), phosphorus (P), and potassium (K) applications during three sugarbeet processing seasons, as averaged for the processing seasons, are reported in table 2. N is primarily organic with the mean nitrate-N concentration of 0.6 mg/L. Total Kjeldahl N varied widely at the three processing plant waste water irrigation fields. At Twin Falls, maximum applied N was 682; minimum, 15; and mean, 133 mg/L. At Rupert, maximum N was 135;minimum, 7; and mean, 71 mg/L. At Nampa, maximum N was 54; minimum, 10; and

TABLE 2.—*Annual waste water, chemical oxygen demand (COD), nitrogen, phosphorus, and potassium applications on fields irrigated with sugarbeet processing waste water*

[Dashes indicate no data]

Location (irrigation schedule[1])	Water applied	COD	Nitrogen	Phosphorus	Potassium
	Cm	*Tons/ha*		*Kg/ha*	
			TWIN FALLS		
(A)	155	139.5	4200	34	2820
	74	27.6	776	19	1780
	90	24.2	569	15	1545
(B)	87	46.6	1582	13	1005
	83	31.1	864	21	1855
	138	37.8	980	28	2535
(C)	48	22.3	860	7	630
	63	24.9	672	19	1415
	106	20.6	738	23	1700
(D)	—	—	—	—	—
	42	17.1	555	14	1095
	169	46.9	1425	43	3405
			RUPERT		
(A)	109	60.6	1150	16	430
	113	20.3	745	28	1275
	28	8.1	370	13	490
(B)	48	28.0	570	8	195
	82	14.4	525	20	895
	28	8.1	370	13	490
(C)	28	15.1	335	5	130
	43	7.9	280	11	470
	—	—	—	—	—
(D)	—	—	—	—	—
	50	10.0	335	11	510
	28	8.1	370	13	490
			NAMPA		
(B)	192	16.3	430	27	5320
	201	18.7	630	49	6350
(C)	159	13.7	320	20	4055
	187	18.4	545	50	5960
(D)	116	10.4	277	15	3080
	114	9.7	383	26	3410

[1] See text p. 2 for irrigation frequency.

[2] Represents processing season.

mean, 35 mg/L in the processing waste water. P concentrations were rather low and varied much less than N with the mean concentrations as follows: Twin Falls, 1.9; Rupert, 1.8; and Nampa, 1.7 mg P/L. K concentrations were as follows: Twin Falls, 5.6; Rupert, 3.1; and Nampa, 7.2 meq K/L of waste water.

The waste water irrigations all occurred during the fall, winter, or early sping while the alfalfa or grass was dormant. Summertime irrigations with canal water for crop maintenance were made as needed to grow a hay crop.

Chemical Oxygen Demand in Waste Water and in Water Extracted From the Treatment Field

COD concentrations in the waste water varied widely with time and locations. At the Twin Falls and Nampa plants, the waste water was stored for a short time in ponds before being pumped to the fields. The storage ponds buffer value changes in COD concentration by (the admixture of) a large volume of plant effluents. Early in the first season of operation of the waste water irrigation system at Twin Falls, concentrated Steffen's waste spilled into the pond. This raised the COD concentration of the pond to over 8000 mg COD/L. In a few weeks, the high COD concentration was diluted out by the usual lower COD waste water, but large amounts of COD and other constituents were applied to the land when the high concentration waste was being distributed to the fields. The average concentration of COD in the Twin Falls waste water for the second and third processing seasons was approximately 3300 mg/L. At the Rupert sugarbeet processing plant waste water irrigation field, COD concentrations during the processing season ranged from 1500 to 5300 mg/L and averaged 3300 mg/L for three processing seasons. COD concentrations at the Nampa plant were lower than at the other two plants, ranging from 345 to 2000 mg/L and averaging 1100 mg/L for two processing seasons (appendix table 1).

COD applications to the waste water irrigation fields ranged form 7.9 to 139 metric tons/ha-year. The average applications on the fields outside of the experimental treatment areas were as follows: Twin Falls, 23; Rupert, 9; and Nampa, 10 metric tons COD/ha-year. These values corresponded to 62, 25, and 24 kg/ha-day for the three respective field areas calculated on the basis of 365 days (table 2).

The COD analysis for water samples extracted from the 150-cm depth in the waste water irrigation fields were summarized for the 2 or 3 years of the experiments (appendix table 1). At the Twin Falls waste water irrigation fields, an average of 48 percent COD reduction was found at the 150-cm depth for the three processing seasons for the 4-week irrigation schedule. The mean waste water COD was 3888 and the soil water COD was 2057 mg/L. At the Rupert waste water irrigation field, the waste water COD averaged 3456 and the soil water COD 548 mg/L for an average of 84 percent COD reduction for 3 years. At the Nampa waste water irrigation field, the waste water averaged 1054 and the soil water 268 mg/L for an average COD reduction of 75 percent. There was an annual cycle of soil water COD with the highest concentrations coming during the sugarbeet processing season and the lowest values in the summer.

Soil water analysis for samples taken during the summer at the 150-cm depth averaged 97.5, 98, and 88 percent COD reduction from the average waste water COD concentrations during the sugarbeet processing season at the Twin Falls, Rupert, and Nampa plants, respectively.The COD cycle resulted from a decrease in COD application following the sugarbeet processing season and biological decomposition of the added organic materials in the soil as well as leaching of added organic materials. In some areas, the soil is deeper than the 150-cm sampling depth, and organic material cleanup by filtration and biological activity will continue as the water infiltrates. This should ultimately produce a clean effluent.

Nitrogen in Waste Water and in Extracted Waste Water Samples

N applications to the general field areas ranged from 277 to 1425 kg/ha. Except for the 1425-kg application average at Twin Falls, the maximum N application was 555 kg/ha. These rates can be utilized by growing crops with little possibility of high nitrate (NO_3-) concentrations in the forage or of pollution of the ground water. The 4-week irrigation schedule in the experimental plots received similar amounts of N to that of the general field applications. The best practice, therefore, seems to be to irrigate the fields with waste water at approximately 4-week intervals with the waste water N concentrations generally found in the three waste waters used at the plants with which we worked. Of course, the other experimental treatments applied more N and were generally higher than was desirable for best practices in waste water irrigation as determined by N fertilization.

High total N was found in the waste water samples from the Twin Falls plant, which corresponded to high COD concentrations early in the project. The maximum total N was 680 mg/L with an average for the processing season of 210 and for the three seasons of 132 mg/L. The average total N remaining in the soil water at the 150-cm depth was 35 mg/L, which represented a decrease of 97 percent in passage through 150 cm of soil. At the Rupert plant, no such high N concentrations were found. The average for three processing seasons was 75 mg/L with an average soil water N concentration of 2.4 mg/L. This represented a 98-percent decrease in total N with passage of the waste water though 150 cm of soil. At the Nampa waste water irrigation field, the average total N for two processing seasons was 36 mg/L. The total N in the soil water at 150 cm was 4 mg/L, which represented an 88 percent decrease in organic N.

NO_3-N in the waste water at the three waste water irrigation fields was low with less than 1 mg/L at the three locations. Organic N is converted to NO_3 when the organic matter in the waste water is decomposed. NO_3 concentrations in the soil water occasionally reached very high concentrations. The range at the Twin Falls field was 0 to 167 mg N/L with an average of 17 mg/L of NO_3-N. By removing three high NO_3 values from the total before averaging the concentrations, the mean of the remaining 51 values was 8.7 mg NO_3-N/L. Many of the soil water samples had a NO_3-N concentration below 1 mg/L. At the Rupert field, NO_3 concentrations were considerably lower than at Twin Falls with a range of 0 to 13 mg/L and an average concentration of 2.3 mg NO_3-N/L. NO_3 concentrations at the Nampa waste water irrigation field were intermediate with a range of 0 to 30 mg N/L and an average of 7.8 mg NO_3-N/L (appendix table 3).

Phosphorus and Potassium in Waste Water and Extracted Soil Water

P concentrations in the waste water were low, and, consequently, relatively small applications of P were made in the waste water. The normal irrigation rates for the three fields would apply P at rates too low to maintain the fields at adequate P levels; therefore, soil tests should be run periodically to determine the need for additional P fertilizer.

In the sugarbeet processing waste water at the Twin Falls site, P averaged 1.9 and ranged from 0.8 to 4.1 mg/L. At the Rupert site, the average P concentration was 1.8 with a range of 0.7 to 4.3 mg/L. At the Nampa site, the average P concentration was 1.7 with a range of 0.3 to 2.9 mg/L. The average concentrations, at the 150-cm depth in the soil at the three sites were 0.19, 0.12, and 0.62 mg/L for the Twin Falls, Rupert, and Nampa sites, respectively (appendix table 4). P concentrations are low enough for there to be a minimal amount of P leaching through the soil. The higher concentration of P in the soil water at the Nampa site compared with the concentration of P at the other two sites probably is associated with soil differences and is not directly related to P concentrations in the waste water.

K applications on the waste water irrigation fields were high to very high. The lowest K concentrations and applications were found at the Rupert fields with intermediate values at Twin Falls and the highest at Nampa. General field applications of K ranged from 490 to 3410 kg/ha. K fertilization of the waste water irrigation field was higher than will be needed for any crop being grown; therefore, an excess of K will accumulate.

K concentration in the waste water at the Twin Falls waste water irrigation field averaged 5.57 and ranged from 1.1 to 13.2 meq/L. At the Rupert site, the average was 3.2

and the range was 1.6 to 7.3 meq K/L. At the Nampa site, the average was 7.3 and the range was 3.2 to 14.8 meq K/L. K concentrations in the soil water extracted from the 150-cm depth were 2.3, 0.21, and 0.21 meq K/L for the Twin Falls, Rupert, and Nampa waste water irrigation fields (appendix table 5). A large amount of K is being applied to these waste water irrigation fields and varying amounts are being leached through the soil profile. A K equilibrium will probably be reached after a few years of waste water irrigation in which the amount of K leached from the fields will approximately equal that which is applied in the waste water.

Electrical Conductivity, Calcium, Magnesium, Sodium, Sodium Absorption Ratios, and pH

Electrical conductivity (EC) and the associated salt in the waste water is one of the general concerns about irrigating with sugarbeet processing waste water. Appendix table 6 gives the EC values for waste water and soil water extracted from several depths in the waste water irrigation fields at the three locations. At the Twin Falls site, EC in the waste water was 2.6 to 6.8; irrigation water, 0.3, and soil water extracted from 150-cm depth, 0.9 to 1.7 in summer and 5.2 mmhos/cm^2 in winter during the waste water irrigation season. At the Rupert site, EC values were as follows: waste water, 1.6 to 3.2; irrigation water, 0.5; and soil water, 1 to 3 mmhos/cm^2. At the Nampa site, EC values were: waste water, 2.2 to 6.2; irrigation water, 0.8; and soil water 1.6 to 5.1 mmhos/cm^2.

Many of the EC values reported for the waste water and for the soil water extracted from the 150-cm depth are too high for growing crops. The quality of the irrigation water used during the growing season in every case was good. Irrigation with waste water is a wintertime operation at the three locations, and the salt associated with waste water is applied in the winter when the crops living on the fields are dormant. During this time, when little water is utilized by the crops, the high salt concentrations in the water appear to have little effect on the crop. Irrigating with good quality water in the spring and during the cropping season leaches the salt from the root zone and lowers the EC to acceptable levels for growing the alfalfa and grass hay.

Calcium (Ca) concentrations in the waste water and in the soil water extracted from several depths in the soil are reported in appendix table 7. Soluble Ca in the waste water is fairly high because hydrochloric acid is used to dissolve accumulated lime from the sirup evaporators between batches as needed. The spent acid wastes, containing large amounts of calcium chloride, are discharged into the sugarbeet flume system from which the overflow is used for irrigation. Ca concentrations in the waste water at the various locations are as follows: Twin Falls: waste water, 1.8 to 26.4, averaging 9.4; irrigation water, 2.2; and soil water, 2 to 40 meq/L. Rupert: waste water, 2.7 to 19.6, averaging 5.4; irrigation water, 2.8; and soil water, 3.5 to 19 meq/L. Nampa: 3.6 to 16.5, averaging 6.3; irrigation water, 1.8; and soil water, 3.6 to 34.4 meq/L. These examples of soil water Ca concentrations were from samples that were extracted from the 150-cm soil depth. This and several other depths are reported in appendix table 7.

Magnesium (Mg) concentrations in the waste water and in soil water extracted from several depths in the soil are reported in appendix table 8. Mg in the waste water originates from two sources: at the Twin Falls factory, the major source was the Steffen House waste; at the other two locations, impurities were removed from the sugar by ion exchangers. Recharging the ion exchangers with magnesium chloride is the source of much of the Mg found in the wastes at the Rupert and Nampa plants, Mg concentrations in the waste water and soil water at the various locations are as follows: Twin Falls: waste water, 1.5 to 6.8, averaging 4.0; irrigation water 1.4; and soil water at 150-cm depth, 1.9 to 20.8 meq/L. Rupert: waste water, 1.6 to 7.1, averaging 2.8; irrigation water, 1.7; and soil water, 2.2 to 13.7 meq/L. Nampa: waste water, 4.7 to 18.3, averaging 11.6; irrigation water, 1.1; and soil water, 2.7 to 26.9, averaging 13.6 meq/L.

Sodium (Na) concentrations in the waste water and the soil water extracted from several depths in the soil are reported in appendix table 9. Na in these systems is derived from (1) the sugarbeets being processed, (2) the small amount in the source water, and (3) the soil. Na concentrations in the sampled waters at the various locations was as follows: Twin Falls: waste water, 5.4 to 14.6, averaging 8.7; irrigation water, 0.7; and soil water 3.2 to 13.4 meq/L. Rupert: waste water, 0.9 to 5.8, averaging 2.0; irrigation water, 1.2; and soil water, 1.8 to 6.0 meq/L. Nampa: waste water, 3.2 to 11.2, averaging 6.0; irrigation water, 1.7, and soil water, 1.0 to 10.1 meq/L. Because of the abundant supply of Ca and Mg in the waste water and the soil water, Na leaches readily through the soils. The Na concentration in the soil water directly reflects the concentration in the waste water and indicates that Na is leaching without building up in the soil.

Sodium absorption ratios (SAR) calculated from the mean values for Na, Ca, and Mg at each sampling date and site at the various depths are reported in appendix table 10. The SAR values at all of the sampling sites, in all the waste water samples, and in all of the soil water samples are low enough that there should be no problems with Na buildup and loss of soil infiltration capacity because of irrigating with these waste waters. Waste water SAR values at Twin Falls, Rupert, and Nampa ranged from 1.8 to 8.8, 1.0 to 3.2, and 1.6 to 4.1, respectively. SAR values in the irrigation water at the three locations were 0.7, 0.8, and 1.1, respectively. Soil water SAR values ranged from 1.6 to 3.0, 1.0 to 2.0, and 0.6 to 5.6, respectively, for the three locations. All of these values are considerably below the value that would pose a Na hazard in the soil.

The pH values for waste water, irrigation water, and soil water extracted from several depths in the field are reported in appendix table 11. The pH values reported in table 11 are all within the normal range for neutral to calcareous soils and, with the exception of one pH value of 10.6 found at Twin Falls, were between 6.6 and 8.4. With these values, there is no reason to be concerned about the soil or water pH resulting from irrigation with these sugarbeets processing waste waters.

Chlorides, Sulfates, and Bicarbonates in Water Samples

Appendix tables 12, 13, and 14 contain data on chloride, sulfate, and bicarbonate concentrations in waste water, irrigation water, and soil extracts from the sugarbeet waste water irrigation fields. Chloride concentrations in the waste water were 8, 8, and 23 meq/L at Twin Falls, Rupert, and Nampa. The higher concentration of chloride at Nampa resulted from ion exchanger recharge with magnesium chloride. The same system was used at Rupert, but apparently the backwash from the ion exchangers was diluted more there. Chloride leaches readily through the soil, and the resulting soil water chloride concentrations were similar to the waste water concentrations. At the three locations, they ranged from 3.1 to 11.0 at Twin Falls, 0.7 to 11.0 at Rupert, and 3.6 to 38.3 meq/L at Nampa waste water irrigation fields.

Sulfate concentrations were relatively low at the three waste water irrigation systems, averaging 1.5, 1.1, and 0.7 meq/L at Twin Falls, Rupert, and Nampa, respectively. The sulfate also leached readily through the soil, and concentrations in the soil solution were similar to those in the waste water with values of 0.1 to 5 meq/L at the three locations in the soil solution.

Bicarbonate concentrations in the waste water at Twin Falls ranged from 13.2 to 49.5, averaging 31 meq/L; at Rupert, the range was 2 to 27.5, averaging 11.1 meq/L and, at Nampa, the range was 5 to 13, averaging 9 meq/L. The irrigation water ranged in bicarbonate at the three locations from 2 to 4 meq/L. Soil water extracted from the 150 cm depth in the soil ranged in bicarbonate from 2.3 to 41, 1.9 to 24, and 2.6 to 15 meq/L at Twin Falls, Rupert, and Nampa, respectively. This anion also leaches readily as indicated by the soil water bicarbonate concentrations that were similar to the waste water bicarbonate concentrations.

Composition of Harvested Hay

Chemical composition of the harvested hay samples for 1976, 1977, and 1978 are given in table 3. These analyses include NO_3-N, total N, P, K. The total N analyses include nitrates and represent a fairly wide range of values from 1.63 to 3.88 percent total N. This corresponds to a crude protein concentration of 10.2 to 24.2 percent (total N x 6.25). The NO_3 concentrations of the initial samplings were relatively high, ranging up to 9,500 p/m NO_3-N.

Values above 2,000 p/m NO_3-N are considered

TABLE 3.—*Analyses of hay samples grown on sugarbeet processing waste water irrigation fields*
[Dashes indicate no data]

Date	Nitrate-nitrogen	Total nitrogen	Phosphorus	Potassium
	P/pm	*Percent*		
		TWIN FALLS		
July 1976	2,250	2.22	0.21	2.78
June 1977	3,520	2.22	0.24	3.00
Aug. 1977	1,090	2.98	0.30	3.88
Oct. 1977	2,020	3.10	0.25	3.14
June 1978	330	1.66	0.22	3.27
July 1978	560	2.44	0.20	2.72
Sept. 1978	810	2.70	0.29	3.04
		RUPERT		
July 1976	3,540	2.52	0.32	2.66
June 1977	1,000	1.63	0.28	2.99
Aug. 1977	310	1.80	0.23	2.76
June 1978	560	—	0.28	2.71
Sept. 1978	415	2.41	0.21	2.08
		NAMPA		
Oct. 1976	9,500	3.08	0.62	4.06
May 1977	780	3.45	0.39	3.71
June 1977	220	2.32	0.35	3.69
July 1977	230	2.62	0.38	2.72
May 1978	70	1.65	0.23	3.10
July 1978	875	3.88	0.46	3.40
Sept. 1978	415	3.06	0.30	2.10

to be hazardous to livestock. In this case, the livestock should be conditioned to high concentrations of nitrate or the feed should be diluted with other feed containing less nitrate (*11*). P concentrations in the forage ranged from adequate (0.2 percent) to high (0.6 percent) and should provide a P-sufficient ration for livestock. K concentrations in the forage were also adequate to high. With the amount of potassium being applied in the waste water, the K content will continue to be high in the forage.

Soil Analysis

Soil samples were taken in the waste water irrigation fields at the beginning and end of the research project. Appendix table 15 gives data on the soil analysis for organic matter, total N, K, Ca, Mg, Na, sulfate, SAR, pH, and EC. These analyses were made on soil samples obtained from six depths from the surface to 150 cm deep.

SUMMARY

Waste water irrigation rates of 10 cm per irrigation at intervals of 1, 2, or 4 weeks were established at three sugarbeet processing waste water irrigation fields in southern Idaho. The rates of irrigation used by the sugar company for disposal of their waste water on the balance of the fields were also monitored. Waste water applications ranged from 28 to 169 cm per year with additional water used during the summer to grow the hay crops on the fields. The organic matter applied in the waste water (COD) ranged from 7.9 to 140 metric tons per year or 22 to 383 kg/ha-day. These highest rates applied excessive amounts of organic matter and nutrients to the fields. The range of organic matter applied to the general field areas that were not in the experimental plots was 10 to 47 metric tons/ha-yr.

N applications in the waste water ranged from 280 to 4200 kg N/ha-yr with the range for the general field area being 277 to 1425 kg N/ha-yr. P applications were relatively low for waste water irrigation with 5 to 50 kg P/ha-yr being applied. K applications were, in many cases, very high with a range of 130 to 6350 kg K/ha-yr. The lower N application rates could be utilized by growing plants, but the highest rates were in excess of crop requirements or crop utilization capacity. In many cases, P applications were lower than crop requirements and would therefore require periodic soil tests and perhaps P fertilization. K applications in the waste water were high to very high and will probably reach an equilibrium where the applied K will leach through the soil at about the same rate that it is applied.

EC and salts in the waste waters are high to very high and would pose serious problems for irrigating crops if the waste water were used during the growing season. Winter irrigation with the waste water, when crops are dormant, decreases the problems of salinity. Salts can be leached from the root zone of the plants with good quality irrigation water before the hay begins to grow in the spring. Even though a large amount of salt was leached through the soil in these waste water irrigation fields, the crops grew satisfactorily and the system works well and looks good. Leaching of organic constituents of the waste water has been greater than would be desired. Measurements at the 150-cm depth showed lower values of COD removal than were found with potato processing waste water (*25*). Irrigation with good quality water in the summer has given the fields time to recover from organic loading, and the soil micro-organisms decomposed the added organic residues.

The design and management of these waste water irrigation fields has been excellent. It should be possible to continue irrigating these fields with sugarbeet processing waste water for many years if the loading is not increased above that observed in these experiments.

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APPENDIX

TABLE 1.—*Chemical oxygen demand (COD) in sugarbeet waste water and in water extracted from various depths in the soil. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
								TWIN FALLS											
(A)	[2]0	20	8215	5795	5200	5970	3275	2920	20	20	20	-	-	-	2955	4850	3830	3600	1995
	15	540	3100	4785	-	-	2315	-	130	145	170	-	-	-	1715	-	-	-	1005
	30	225	2895	4915	3965	4145	2565	1165	315	-	175	-	-	-	845	490	-	-	365
	60	120	3650	5065	4285	4500	2840	1680	280	335	230	-	-	-	170	1865	260	-	955
	90	50	3440	5250	4600	4495	2774	1760	1220	1070	755	-	-	-	520	565	215	190	1195
	120	50	2005	5345	4525	4105	2340	1905	575	1795	1895	-	-	-	575	805	230	330	970
	150	55	2040	4825	4500	4030	2795	1655	1380	1560	1375	-	-	-	1090	585	-	305	1030
(B)	15	275	1105	3430	1420	-	290	165	-	310	-	-	-	-	-	-	-	-	-
	30	165	1354	990	465	-	725	120	-	145	-	-	-	-	1145	640	2595	1970	1290
	60	80	530	3280	2855	-	1605	-	-	155	145	-	-	-	505	845	1835	-	1430
	90	40	1400	4300	3735	-	2675	760	-	290	190	-	-	-	95	850	1990	1590	1365
	120	70	30	4565	3830	-	2995	1445	-	525	250	-	-	-	410	2135	2955	1015	1820
	150	30	45	3865	3580	-	2840	1710	-	1145	1050	-	-	-	580	2195	2605	1975	1590
(C)	15	85	2240	3120	2725	-	2880	1465	-	150	90	-	-	-	1855	2440	-	2860	865
	30	65	1930	4210	2440	-	655	945	-	105	65	-	-	-	1890	2555	2640	3110	995
	60	35	3690	4530	2652	-	1830	1425	-	110	75	-	-	-	895	2015	1860	2075	1070
	90	75	2690	3990	2905	-	1830	1180	-	120	60	-	-	-	2205	2685	3475	2765	1570
	120	65	1665	4680	3415	-	2450	1125	-	255	45	-	-	-	1630	3915	3295	2860	1695
	150	75	2005	4620	3710	-	1945	1695	-	495	70	-	-	-	2150	3565	2520	1730	1540
								RUPERT											
(A)	[2]0	5050	6295	5240	4523	6010	-	20	-	20	30	15	5	2595	1995	1530	1915	-	-
	15	950	725	755	1885	-	-	75	-	100	40	25	70	1790	1975	875	-	-	-
	30	530	1555	1010	795	1925	-	90	-	95	35	60	85	1805	2265	875	-	-	-
	60	555	990	800	1465	1965	-	125	-	70	40	50	40	1120	1975	940	-	-	-
	90	460	870	1055	1085	1700	-	450	-	85	45	70	10	1105	1560	815	-	-	-
	120	450	770	705	990	2300	-	245	-	255	55	70	105	1590	1775	980	-	-	-
	150	50	215	360	840	845	-	255	-	115	100	100	115	300	1010	1410	-	-	-
(B)	15	290	1133	360	770	-	-	80	-	-	70	40	-	450	2725	705	400	-	-
	30	235	315	300	625	-	-	80	-	50	45	80	-	345	2295	995	290	-	-
	60	1075	1240	740	910	-	-	125	-	70	50	60	-	535	2470	765	425	-	-
	90	470	485	495	1205	-	-	125	-	70	65	80	-	285	2110	915	430	-	-
	120	225	825	815	1380	-	-	165	-	65	65	55	-	435	2855	1470	370	-	-
	150	270	615	620	690	-	-	345	-	60	65	55	-	215	2425	840	245	-	-

Location (irrigation schedule[1])	Soil depth	1977 Apr.	1977 May	1977 June	1977 July	1977 Aug.	1977 Sept.	1977 Oct.	1977 Nov.	1977 Dec.	1978 Jan.	1978 Feb.	1978 Mar.	1978 Apr.	1978 May	1978 June	1978 July	1978 Aug.	1978 Sept.
(C)	15	245	665	505	1250	-	-	65	-	20	45	45	50	-	2210	670	-	-	-
	30	65	100	405	1135	-	-	70	-	85	50	110	80	1070	2435	330	220	-	-
	60	330	525	2860	1775	-	-	125	-	65	45	55	75	745	1330	560	-	-	-
	90	400	265	225	850	-	-	80	-	65	45	50	60	1140	1975	655	425	-	-
	120	580	180	100	560	-	-	70	-	65	45	55	60	785	1380	660	205	-	-
	150	35	50	80	65	-	-	60	-	75	50	50	65	850	2155	1085	590	-	-

Location (irrigation schedule[1])	Soil depth	1977 Apr.	1977 May	1977 June	1977 July	1977 Aug.	1977 Sept.	1977 Oct.	1977 Nov.	1977 Dec.	1978 Jan.	1978 Feb.	1978 Mar.	1978 Apr.	1978 May	1978 June	1978 July	1978 Aug.	1978 Sept.
	Cm	*Milligrams per liter*																	
TWIN FALLS																			
(A)	[2]0	-	25	15	20	-	-	-	3070	2915	-	-	-	20	-	-	2-	-	-
	15	-	110	110	165	-	-	-	210	570	-	-	-	130	-	-	-	-	-
	30	-	145	115	80	-	-	-	550	485	-	-	-	130	-	-	-	-	-
	60	-	115	50	100	-	-	-	-	470	-	-	-	500	-	-	165	-	-
	90	-	-	-	-	-	-	-	-	605	-	-	-	-	-	-	-	-	-
	120	-	165	-	-	-	-	-	1930	330	-	-	-	-	-	-	-	-	-
	150	-	1340	395	130	-	-	-	-	605	-	-	-	610	-	-	185	-	-
(B)	15	-	155	-	160	-	-	-	485	720	-	-	-	320	-	-	-	-	75
	30	-	185	100	65	-	-	-	1065	1125	-	-	-	395	-	-	85	-	65
	60	-	160	105	60	-	-	-	1410	1045	-	-	-	615	-	-	70	-	70
	90	-	195	100	140	-	-	-	1065	910	-	-	-	320	-	-	85	-	80
	120	-	-	860	185	-	-	-	-	-	-	-	-	345	-	-	-	-	320
	150	-	840	-	125	-	-	-	1160	-	-	-	-	400	-	-	-	-	50
(C)	15	-	80	40	30	-	-	-	1390	880	-	-	-	-	-	-	-	-	-
	30	-	75	40	50	-	-	-	1420	530	-	-	-	-	365	-	150	-	90
	60	-	80	45	55	-	-	-	1480	920	-	-	-	-	375	-	160	-	85
	90	-	100	70	75	-	-	-	1585	1590	-	-	-	-	250	-	80	-	80
	120	-	130	85	90	-	-	-	1120	1560	-	-	-	-	230	-	105	-	70
	150	-	110	90	80	-	-	-	1525	1430	-	-	-	-	360	-	115	-	50
RUPERT																			
(A)	[2]0	30	15	20	20	-	20	-	-	2935	-	-	-	-	540	25	25	-	65
	15	55	35	30	35	-	90	-	-	-	-	-	-	-	65	45	45	-	-
	30	-	-	40	35	-	50	-	-	-	-	-	-	-	80	65	105	-	-
	60	70	45	40	40	-	40	-	-	-	-	-	-	-	75	75	105	-	-
	90	70	65	45	45	-	35	-	-	-	-	-	-	-	85	75	80	-	-
	120	85	60	50	45	-	35	-	-	-	-	-	-	-	95	85	85	-	-
	150	75	55	55	45	-	20	-	-	-	-	-	-	-	125	105	105	-	-
(B)	15	50	30	35	35	-	60	1670	-	620	-	-	-	-	80	85	45	80	-
	30	95	45	35	50	-	90	655	-	300	-	-	-	-	65	65	80	70	-
	60	80	45	45	40	-	50	755	-	680	-	-	-	-	60	50	55	55	-
	90	70	45	40	45	-	40	445	-	1025	-	-	-	-	65	65	55	45	-
	120	95	50	40	45	-	40	1235	-	970	-	-	-	-	85	75	75	60	-
	150	85	60	50	45	-	40	640	-	610	-	-	-	-	240	225	95	125	-

See footnotes at end of table.

TABLE 1.—*Chemical oxygen demand (COD) in sugarbeet waste water and in water extracted from various depths in the soil. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
								RUPERT—Continued											
(C)	15	100	25	-	120	-	-	1930	-	670	-	-	-	-	-	-	95	60	-
	30	95	25	-	50	-	75	1380	-	430	-	-	-	-	110	-	145	75	280
	60	65	40	40	45	-	60	915	-	810	-	-	-	-	120	-	105	80	100
	90	130	30	30	45	-	20	810	-	870	-	-	-	-	120	-	135	75	85
	120	70	45	55	60	-	35	530	-	485	-	-	-	-	125	-	110	85	80
	150	160	65	60	50	-	40	620	-	585	-	-	-	-	120	-	125	75	85

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm	*Milligrams per liter*																
								NAMPA										
(B)	[2]0	-	1230	1990	1845	2310	1305	625	430	435	15	15	1215	1110	636	345	853	75
	15	60	1655	950	750	1980	1100	225	125	140	90	30	240	140	130	120	330	70
	30	40	1370	735	1015	780	1040	255	85	125	55	45	675	170	165	120	330	60
	60	35	330	560	1025	1220	1455	95	145	60	45	30	195	90	120	120	145	55
	90	55	145	175	-	1145	960	115	100	110	75	70	400	245	125	145	115	95
	120	50	35	45	135	1035	1160	415	100	155	140	290	585	155	130	110	120	90
	150	45	20	40	55	665	1355	405	105	65	45	195	70	195	90	120	135	120
(C)	15	50	1625	1405	1385	221	-	245	75	245	65	30	1540	-	270	100	825	65
	30	35	1545	1375	1322	-	-	-	75	205	65	30	1520	425	275	115	920	90
	60	25	1160	1235	1575	175	500	255	75	165	65	30	635	375	250	100	510	80
	90	30	1330	1235	1385	-	280	245	85	140	75	35	1430	240	225	105	190	90
	120	15	1040	580	1125	1460	-	300	95	125	130	70	1145	-	185	85	105	155
	150	15	615	375	990	335	-	300	95	190	120	85	90	75	190	115	90	170

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 2.—*Total Kjeldahl nitrogen (TKN) in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
								TWIN FALLS											
(A)	[2]0	-	682.2	202.2	134.2	130.0	71.5	44.0	1.1	0.8	0.9	-	-	-	93.0	148.1	120.3	90.0	53.0
	15	-	173.6	161.8	-	-	-	-	10.6	-	9.5	-	-	-	-	-	-	-	6.3
	30	-	116.2	170.5	135.8	-	66.4	52.6	-	-	-	-	-	-	-	-	-	-	-
	60	-	181.2	190.3	136.8	108.0	72.3	58.0	-	-	-	-	-	-	3.1	8.1	-	-	5.7
	90	1.9	155.4	204.7	123.1	105.8	68.0	-	31.7	16.0	73.8	-	-	-	14.4	38.8	-	-	5.1
	120	2.0	118.5	171.9	-	-	56.0	57.1	39.9	20.4	7.4	-	-	-	55.4	100.0	-	-	4.5
	150	1.6	48.0	172.3	146.3	-	64.3	-	97.1	89.2	2.4	-	-	-	42.1	69.0	-	-	-
(B)	15	5.9	8.2	88.2	-	-	9.6	-	-	-	-	-	-	-	-	-	-	10.2	-
	30	-	-	7.4	-	-	-	-	-	-	-	-	-	-	5.9	-	12.5	-	14.2
	60	3.3	3.8	86.4	71.1	-	27.1	-	-	9.0	34.0	-	-	-	4.2	5.1	6.0	-	-
	90	1.9	14.6	110.2	153.8	-	56.1	-	-	26.0	10.1	-	-	-	-	-	11.9	-	11.5
	120	1.9	1.8	143.7	6.7	-	47.3	38.8	-	8.0	2.4	-	-	-	-	26.2	33.9	43.5	38.1
	150	1.4	2.1	90.3	72.1	-	56.7	31.5	-	7.6	3.1	-	-	-	7.4	6.5	-	-	-
(C)	15	1.8	108.2	-	-	-	-	42.1	-	4.6	3.5	-	-	-	22.1	-	-	37.0	13.9
	30	2.4	19.5	23.1	49.1	-	-	17.4	-	2.4	3.2	-	-	-	10.1	-	25.0	40.0	12.5
	60	1.3	72.6	101.4	93.1	-	61.9	34.9	-	3.3	3.6	-	-	-	7.3	-	11.3	53.0	12.6
	90	2.9	54.1	81.6	75.7	-	59.1	29.1	-	-	2.7	-	-	-	16.9	-	61.0	53.6	-
	120	2.7	53.6	67.4	86.3	-	63.2	25.9	-	5.4	2.9	-	-	-	20.2	-	89.2	58.2	31.5
	150	1.6	75.5	131.1	64.1	-	82.3	52.4	-	5.7	3.8	-	-	-	4.1	-	21.5	15.0	15.3
								RUPERT											
(A)	[2]0	.8	135.5	83.6	83.5	55.0	-	2.0	-	1.0	.7	1.2	-	79.2	60.3	76.3	60.7		
	15	-	3.7	18.9	6.6	-	-	-	-	5.2	2.6	1.3	1.3	7.0	9.3	14.9	-		
	30	-	5.6	6.6	12.7	-	-	4.7	-	3.8	1.6	-	1.4	9.6	-	-	-		
	60	3.6	3.9	3.5	8.2	7.7	-	6.0	-	2.9	1.8	1.2	1.1	3.4	7.3	2.4	-		
	90	2.5	2.8	3.6	7.7	13.1	-	7.1	-	4.3	1.6	-	1.5	3.0	5.9	17.9	-		
	120	2.5	3.9	3.4	5.9	8.5	-	7.4	-	4.4	2.6	2.4	2.3	4.4	4.9	5.2	-		
	150	1.6	2.3	2.1	2.1	2.4	-	5.2	-	3.3	2.0	3.5	2.3	2.0	1.9	2.4	-		
(B)	15	4.1	5.5	2.7	4.5	-	-	6.4	-	-	2.6	1.2	-	2.5	7.6	11.0	10.6		
	30	4.0	2.8	-	-	-	-	4.1	-	2.8	1.5	-	-	2.1	2.8	-	-		
	60	2.2	5.1	5.2	4.9	-	-	5.0	-	3.3	2.1	1.4	-	4.7	6.6	-	-		
	90	2.4	2.0	3.9	5.8	-	-	6.6	-	7.1	2.3	1.0	-	3.8	7.2	-	-		
	120	2.4	3.2	3.0	4.7	-	-	5.2	-	4.7	2.6	1.4	-	4.8	9.4	7.0	5.2		
	150	2.7	2.4	3.0	2.6	-	-	3.8	-	2.2	2.3	3.4	-	2.1	2.3	2.6	-		

See footnotes at end of table.

TABLE 2.—*Total Kjeldahl nitrogen (TKN) in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
								RUPERT—Continued											
(C)	15	1.5	-	14.1	5.3	-	-	4.3	-	-	6.5	1.5	1.7	1.0	7.1	9.4	-		
	30	2.9	2.9	3.5	4.3	-	-	4.3	-	2.9	2.2	-	.8	5.8	5.6	4.0	-		
	60	2.0	4.5	13.8	7.9	-	-	6.9	-	2.8	1.7	1.3	1.3	2.5	3.7	2.7	-		
	90	2.3	2.0	4.7	4.6	-	-	4.3	-	2.8	1.6	.8	1.0	2.2	9.4	7.0	4.1		
	120	2.0	2.3	2.0	5.5	-	-	3.9	-	3.2	2.1	1.2	.8	1.8	2.7	1.9	2.0		
	150	.9	2.0	2.7	1.2	-	-	2.9	-	1.6	1.4	1.0	.5	1.5	4.0	2.2	3.0		

Location (irrigation schedule[1])	Soil depth	1977									1978					
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milligrams per liter*														
							TWIN FALLS									
(A)	[2]0	-	-	0.8	1.8	.6	.1	-	83.2	98.6	32.6	15.0	-	-	-	0.9
	15	-	-	5.5	3.4	-	2.4	-	-	6.9	-	-	-	-	-	-
	30	-	2.9	-	3.6	-	2.2	-	-	-	-	-	-	-	-	-
	60	-	2.6	2.4	-	-	-	-	-	-	-	-	-	-	-	-
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	150	-	5.8	6.6	5.2	-	4.9	-	-	12.4	-	-	-	-	-	-
(B)	15	-	2.3	-	-	-	5.0	-	15.4	17.6	3.4	-	-	-	-	3.5
	30	-	2.5	2.8	-	.7	1.8	-	5.5	6.0	4.0	-	-	-	-	2.6
	60	-	5.2	2.9	-	2.5	.8	-	19.2	30.6	6.6	-	-	-	-	2.0
	90	-	4.5	3.0	-	3.2	1.5	-	5.6	5.5	2.5	-	-	-	-	2.4
	120	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-
	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(C)	15	-	2.3	1.9	-	1.4	-	-	16.6	20.1	-	-	-	-	-	-
	30	-	1.7	1.5	-	1.9	-	-	12.6	6.1	-	-	-	-	-	-
	60	-	2.4	-	-	2.4	-	-	28.5	23.7	-	4.6	-	-	-	-
	90	-	-	-	-	3.0	-	-	47.9	68.6	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	17.6	49.8	-	-	-	-	-	-
	150	-	8.1	-	-	-	-	-	29.8	-	-	-	-	-	-	-

Location (irrigation schedule[1])	Soil depth	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.	1977 Apr.	1977 May	1977 July	1977 Aug.	1977 Nov.	1977 Dec.	1978 Mar.	1978 Apr.	1978 May	1978 July
	Cm	*Milligrams per liter*																
RUPERT																		
(A)	0[2]	1.3	.8	.7	1.1	-	6.7	77.8	-	59.2	-	1.0	1.1	1.1	1.0	-		
	15	7.2	-	1.3	-	-	2.2	-	-	-	-	1.7	1.0	1.8	-	-		
	30	-	-	1.5	-	-	-	-	-	-	-	-	1.1	-	-	-		
	60	-	-	-	-	-	4.3	-	-	-	-	-	-	1.3	1.1	-		
	90	-	-	3.6	-	-	1.4	-	-	-	-	3.5	1.3	1.3	18.1	-		
	120	-	-	-	5.4	-	4.3	-	-	-	-	-	21.1	24.2	10.8	-		
	150	2.4	-	1.7	2.0	-	1.8	-	-	-	-	-	-	22.1	1.7	-		
(B)	15	3.2	-	1.6	.9	-	2.2	32.6	-	-	-	1.5	3.6	1.5	1.3	-		
	30	-	-	2.2	1.3	-	3.9	-	-	-	-	1.5	1.1	1.4	1.0	-		
	60	-	-	1.7	1.8	-	1.5	16.9	-	-	-	1.7	-	1.5	1.3	-		
	90	3.4	2.2	1.5	2.0	-	1.5	9.8	-	-	-	2.7	-	2.0	1.5	-		
	120	-	-	2.8	3.4	-	2.4	21.9	-	-	-	37.7	9.1	15.9	14.0	-		
	150	3.0	-	2.2	2.0	-	2.1	-	-	-	-	-	11.9	11.9	13.3	-		
(C)	15	2.3	.6	-	-	-	-	39.4	-	32.1	-	1.0	-	-	1.6	-		
	30	2.7	1.0	-	1.1	-	1.1	12.9	-	25.1	-	-	-	1.4	1.9	-		
	60	2.3	-	-	1.1	-	1.1	5.9	-	-	-	-	-	-	3.5	1.2		
	90	4.2	1.3	1.4	1.2	-	.4	9.3	-	41.8	-	2.2	-	2.0	1.0	1.2		
	120	2.2	1.2	1.0	1.0	-	.5	8.7	-	6.2	-	-	-	2.1	3.2	2.2		
	150	2.0	1.3	1.9	1.8	-	2.2	6.9	-	4.3	-	-	-	4.6	4.1	4.0		
NAMPA																		
(B)	0[2]	42.9	47.0	54.3	54.3	53.6	24.6	15.0	11.5	9.9	-	2.0	56.1	78.3	16.2	12.8	16.5	1.3
	15	1.0	2.3	-	-	8.5	12.8	17.7	10.6	1.7	1.8	1.6	6.9	8.2	1.6	2.0	2.4	-
	30	1.0	-	1.0	1.3	6.4	3.8	5.1	2.9	1.1	.6	1.1	9.9	7.3	1.3	1.6	2.8	1.0
	60	1.3	1.9	1.2	1.8	3.2	6.5	2.4	3.3	.9	.8	.9	14.9	-	-	-	2.2	3.4
	90	-	-	-	-	1.4	1.9	-	-	-	.6	1.6	1.4	1.4	1.3	1.0	.9	-
	120	-	.9	2.0	1.0	6.7	2.7	.8	1.2	.8	.4	1.2	7.0	41.0	1.4	2.0	1.6	1.2
	150	1.5	1.6	.4	.4	1.0	1.6	1.2	1.8	.9	.6	1.2	1.1	1.0	.7	.8	.9	.8
(C)	15	-	8.5	8.3	2.6	-	-	8.5	3.1	2.2	1.3	1.2	14.1	-	2.7	2.3	5.0	2.3
	30	1.1	4.4	9.2	14.7	-	-	-	2.8	1.8	1.5	.8	11.9	-	1.8	1.9	3.8	.8
	60	1.4	2.6	11.4	16.6	3.0	-	7.4	3.2	2.4	1.0	.8	5.0	3.0	1.8	1.8	2.9	.7
	90	-	2.1	2.0	26.3	-	-	2.2	2.8	.7	1.1	1.0	4.5	2.2	-	-	1.7	1.7
	120	1.3	1.9	1.4	2.0	-	-	-	1.5	.8	.7	1.6	1.6	-	1.1	1.3	-	-
	150	-	1.9	1.3	2.2	-	-	-	0	1.0	.8	.7	1.0	.7	1.3	1.5	1.4	.6

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 3.—*Nitrate nitrogen in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
								TWIN FALLS											
(A)	[2]0	-	2.0	1.0	0.5	0.6	1.4	1.5	0	0	0.1	-	-	-	0.4	0.5	0.6	0	0
	15	54.0	35.2	1.4	-	-	.2	0	257.5	255.0	320.2	-	-	-	275.0	-	-	-	5.2
	30	-	25.9	1.2	.4	.5	.2	.1	400.0	-	539.7	-	-	-	106.7	450.0	-	-	100.0
	60	5.3	22.6	1.3	.4	.3	.2	.1	21.8	143.8	200.9	-	-	-	101.0	291.0	400.0	-	106.1
	90	1.7	32.4	1.3	.4	.5	.2	.4	4.5	2.9	3.6	-	-	-	101.1	153.8	96.3	44.7	91.5
	120	1.0	5.1	1.3	.4	.5	.3	.4	1.2	1.6	3.0	-	-	-	94.4	117.6	68.6	193.1	50.0
	150	1.8	8.6	1.4	.4	.5	.3	.3	-	.8	.5	-	-	-	35.2	166.5	-	167.6	-
(B)	15	36.2	39.5	21.1	6.2	-	9.0	9.0	-	200.0	-	-	-	-	-	-	-	41.9	-
	30	-	31.5	22.8	.9	-	12.2	3.8	-	136.0	-	-	-	-	170.2	155.7	3.3	-	2.3
	60	19.2	22.5	9.8	.9	-	5.8	.3	-	75.8	330.3	-	-	-	80.4	151.0	13.5	-	0.4
	90	12.0	5.4	4.7	.4	-	5.1	-	-	41.8	71.3	-	-	-	.8	106.7	70.8	1.9	0
	120	-	4.9	1.5	.5	-	2.0	.3	-	2.1	9.6	-	-	-	144.2	20.7	75.4	-	0
	150	23.3	8.7	2.4	.4	-	2.7	.5	-	2.3	5.9	-	-	-	140.5	4.4	1.3	-	0
(C)	15	34.8	43.2	1.2	.4	-	4.5	7.2	-	63.0	49.0	-	-	-	3.0	.5	-	0	24.2
	30	30.2	55.1	22.0	.6	-	-	21.4	-	73.5	22.2	-	-	-	3.0	.8	2.3	0	3.0
	60	14.4	21.4	2.1	.5	-	1.9	16.0	-	71.1	73.6	-	-	-	8.5	.6	.7	0	.8
	90	13.6	20.9	3.0	.4	-	.5	23.4	-	66.5	43.6	-	-	-	12.9	.4	1.6	0	0
	120	18.8	28.9	2.2	.7	-	1.2	14.4	-	27.5	34.8	-	-	-	31.4	.7	.6	0	1.4
	150	25.1	12.2	.3	.5	-	.2	3.6	-	.6	49.0	-	-	-	8.5	.6	.3	0	.6
								RUPERT											
(A)	[2]0	1.0	1.1	1.5	1.6	1.0	-	0	-	1.5	1.1	0.7	-	0.6	.8	.4	.1	-	-
	15	55.6	.6	.6	.2	-	-	12.0	-	83.0	13.1	4.6	5.4	.3	3.8	3.7	-	-	-
	30	24.9	.8	.6	.2	.3	-	5.9	-	183.0	29.7	.5	.5	.4	.2	.1	-	-	-
	60	18.8	5.1	1.1	.2	.3	-	8.2	-	57.5	24.4	27.0	18.8	7.9	35.0	.1	-	-	-
	90	8.8	.6	.5	.2	.4	-	7.6	-	44.0	24.6	30.0	29.0	6.7	.4	.1	-	-	-
	120	14.0	6.2	.6	.2	.8	-	8.2	-	13.8	6.9	9.8	8.6	5.0	2.7	.2	-	-	-
	150	10.2	5.2	.6	.2	.4	-	3.5	-	1.8	1.0	.2	.2	.9	1.4	.1	-	-	-
(B)	15	42.1	1.1	.5	.2	-	-	23.8	-	-	43.6	1.1	-	.3	.4	.1	.1	-	-
	30	7.7	17.9	2.8	.2	-	-	20.3	-	151.0	44.1	3.5	-	.8	.3	.1	.0	-	-
	60	10.7	1.0	.5	.2	-	-	17.2	-	106.5	55.1	54.0	-	9.2	.3	.1	.1	-	-
	90	13.1	2.0	.4	.2	-	-	5.6	-	56.8	40.5	20.3	-	7.6	.3	.1	.1	-	-
	120	17.7	4.6	.8	.2	-	-	7.3	-	29.2	12.5	4.2	-	3.3	.3	.1	.1	-	-
	150	13.0	.8	.6	.1	-	-	3.2	-	3.6	.4	.1	-	.2	.2	.2	.1	-	-

(C)	15	-	1.2	11.9	.2	-	-	8.3	-	161.0	8.7	.1	-	.1	.2	.1	-	-	-
	30	26.4	22.9	.7	.2	-	-	15.8	-	97.8	21.6	4.8	.4	.6	.2	0	0	-	-
	60	17.3	1.3	1.1	.2	-	-	10.0	-	57.5	34.8	20.8	19.2	2.7	.3	0	-	-	-
	90	15.1	8.2	7.9	5.0	-	-	7.0	-	25.2	16.9	.5	9.8	4.1	.2	.1	0	-	-
	120	16.6	3.0	7.4	3.0	-	-	9.8	-	20.0	9.0	3.2	3.4	5.5	.2	.1	0	-	-
	150	12.8	10.6	10.3	10.2	-	-	.1	-	3.7	.9	1.0	.5	1.0	.2	.5	0	-	-

Location (irrigation schedule[1])	Soil depth	1977								1978					
		Apr.	May	June	July	Sept.	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milligrams per liter*													
		TWIN FALLS													
(A)	[2]0	-	2.0	.5	0	.3	-	0	0	.1	.1	-	0	-	1.1
	15	-	-	49.5	20.2	12.8	-	-	16.6	4.0	-	-	-	-	-
	30	-	100.1	-	1.0	4.0	-	-	29.6	1.0	0	-	-	-	-
	60	-	54.2	6.6	8.8	6.0	-	-	5.6	-	0	-	.6	-	-
	90	-	-	-	-	-	-	-	9.4	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	16.5	-	-	-	-
	150	-	9.5	3.4	43.6	41.1	-	-	2.9	-	.5	-	.4	-	-
(B)	15	-	165.5	-	-	-	-	19.2	22.8	2.4	-	-	-	-	.5
	30	-	122.2	165.0	83.0	36.3	-	.4	89.8	1.5	-	-	3.8	-	.4
	60	-	125.0	165.5	67.0	22.0	-	.9	6.0	0	-	-	.5	-	6.8
	90	-	64.2	111.5	48.5	26.8	-	1.0	22.4	0	-	-	4.3	-	8.7
	120	-	-	1.2	1.0	-	-	-	-	-	-	-	-	-	156.5
	150	-	-	-	38.5	-	-	-	-	0	-	-	-	-	2.0
(C)	15	-	20.9	.2	.5	-	-	0	2.6	-	-	-	-	-	-
	30	-	16.8	0	.6	-	-	0	2.4	-	-	-	5.2	-	.8
	60	-	22.5	0	0	-	-	0	.3	-	-	-	3.4	-	.7
	90	-	13.6	0	0	-	-	0	0	-	-	-	2.0	-	-
	120	-	6.8	8.1	14.5	-	-	1.5	0	-	-	-	70.0	-	24.6
	150	-	6.5	.1	10.4	-	-	0	1.8	-	-	-	34.4	-	45.5
		RUPERT													
(A)	[2]0	.4	.6	.1	0	-	.1	-	0	-	.4	0	.2	.4	-
	15	9.9	20.2	6.4	0	-	-	-	-	-	3.3	1.5	22.9	5.8	-
	30	-	-	23.2	1.6	-	-	-	-	-	-	2.0	10.2	-	-
	60	16.8	50.0	48.0	34.4	-	-	-	-	-	116.3	3.1	47.3	17.3	-
	90	1.2	40.0	30.8	21.9	-	-	-	-	-	33.6	29.0	47.1	32.8	-
	120	3.1	12.4	23.5	4.6	-	-	-	-	-	8.4	3.0	17.9	17.4	-
	150	.4	2.1	16.9	1.0	-	-	-	-	-	.6	.5	3.2	7.3	-
(B)	15	10.5	7.4	1.2	3.4	-	0	-	.2	-	1.2	.5	12.0	.2	-
	30	8.8	30.1	28.4	36.5	-	0	-	0	-	20.5	4.0	10.0	2.2	-
	60	24.1	25.8	23.0	4.8	-	0	-	0	-	42.3	15.0	8.2	.3	-
	90	16.3	18.6	32.3	35.8	-	0	-	0	-	104.0	52.0	104.0	28.6	-
	120	6.5	3.3	1.0	.1	-	0	-	0	-	21.9	9.0	39.1	16.0	-
	150	.3	.2	0	.1	-	.1	-	0	-	1.7	0	9.5	1.6	-

See footnotes at end of table.

TABLE 3.—*Nitrate nitrogen in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
									RUPERT—Continued										
(C)	15	0.2	2.5	-	-	-	0	-	1.5	-	-	-	2.0	-	-				
	30	.1	1.5	-	-	-	.1	-	0	-	27.1	-	6.1	-	8.6				
	60	4.7	2.5	1.9	-	-	0	-	0	-	30.4	-	51.0	-	26.4				
	90	.3	4.1	21.2	-	-	0	-	0	-	9.8	-	76.1	-	83.0				
	120	2.8	4.5	.1	-	-	0	-	0	-	.8	-	6.6	-	4.0				
	150	2.6	.2	0	-	-	0	-	0	-	.4	-	.9	-	.4				

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm	*Milligrams per liter*																
									NAMPA									
(B)	[2]0	-	1.4	1.8	1.6	.3	.9	.2	.2	1.3	-	.2	0	0	1.7	.5	2.4	0
	15	1.9	.8	117.7	1.9	.9	.4	.9	.5	3.6	0	.2	1.3	6.8	2.2	2.1	4.8	3.1
	30	3.0	.6	2.4	1.4	.1	.1	.6	9.2	27.0	0	.1	0	3.4	2.1	3.4	3.5	1.2
	60	5.0	.4	1.0	1.2	.9	.4	0	18.2	17.9	2.5	0	1.1	65.0	10.7	9.4	5.5	9.5
	90	10.0	1.5	.9	-	.6	0	0	2.1	8.8	1.5	0	.1	0	2.4	4.5	12.4	22.4
	120	13.3	9.0	2.3	1.2	.4	.4	1.7	.5	7.3	17.2	5.2	.8	.2	4.6	5.1	12.2	29.0
	150	9.8	9.0	3.6	5.3	.5	.1	1.1	1.1	4.2	23.6	18.8	12.2	1.8	3.4	3.5	5.1	20.3
(C)	15	-	.8	.8	2.1	16.9	-	.5	3.4	2.6	0	0	0	-	2.1	.2	4.5	0
	30	5.8	.7	1.2	1.9	-	-	-	5.6	2.1	1.2	0	0	0	2.1	.4	5.4	0
	60	29.7	.8	200.0	1.9	1.4	.5	1.5	17.8	2.0	0	0	0	0	2.0	.4	4.5	.3
	90	36.0	.6	230.0	2.0	-	1.1	1.1	22.9	2.6	2.1	0	0	0	2.1	.5	6.6	.1
	120	33.0	.4	54.0	2.0	2.2	-	1.1	15.4	5.7	21.8	.1	0	-	1.9	.6	.2	4.6
	150	30.0	9.0	17.3	1.7	4.5	-	1.0	2.4	20.1	23.6	11.0	0	0	1.9	2.6	2.2	5.2

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 4.—*Total phosphorus in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milligrams per liter*																	
								TWIN FALLS											
(A)	[2]0	-	0.85	1.23	1.21	2.08	2.00	1.10	0.23	0.05	0.18	-	-	-	2.08	3.84	4.06	-	1.02
	15	-	.36	.11	-	-	.19	-	.40	.56	.61	-	-	-	.40	-	-	-	.10
	30	-	.22	.06	.06	.07	.13	.20	-	-	.59	-	-	-	.38	-	-	-	.16
	60	0.13	.06	.04	.06	.06	.09	.16	-	.37	.25	-	-	-	.12	.18	.35	.14	.18
	90	.99	.23	.05	.07	.06	.15	-	.47	.18	.32	-	-	-	.16	.83	.07	-	.12
	120	.10	.03	.06	.06	-	.12	-	.45	.18	.26	-	-	-	.24	.20	-	.13	.10
	150	.09	.05	.10	.08	.07	.16	.55	.57	.43	.26	-	-	-	.22	.12	.06	-	-
(B)	15	.75	.65	.93	.54	-	.36	-	-	.28	-	-	-	-	-	-	-	.44	-
	30	-	-	.60	.07	-	.17	-	-	.27	-	-	-	-	.21	.04	.10	-	.34
	60	.14	.06	.11	.06	-	.11	-	-	.28	.32	-	-	-	.24	.05	.06	-	.13
	90	.12	.10	.13	.09	-	.14	-	-	.19	.73	-	-	-	.03	.02	.07	.14	-
	120	-	0	.03	.05	-	.10	.06	-	.18	.16	-	-	-	.03	.05	.07	-	.14
	150	.05	.08	.10	.05	-	.15	.07	-	.15	.25	-	-	-	.08	.16	.08	-	-
(C)	15	.38	.26	.49	.06	-	.08	.17	-	.79	.59	-	-	-	.16	.06	-	1.18	.13
	30	.41	4.41	.10	.05	-	.13	.13	-	.26	.24	-	-	-	.08	.06	.09	.11	.08
	60	.12	.08	.06	.07	-	.08	.13	-	.15	.19	-	-	-	.12	.05	.12	.80	.10
	90	.07	.03	.04	.06	-	.09	.14	-	.12	.28	-	-	-	.08	.06	.09	.10	.12
	120	.07	.19	.06	.05	-	.10	.13	-	.10	.06	-	-	-	.07	.08	.12	.16	.14
	150	.06	.07	.04	.05	-	.16	.08	-	.09	.16	-	-	-	.06	.06	.12	.08	.08
								RUPERT											
(A)	[2]0	1.23	1.37	2.08	1.90	.68	-	.47	-	.29	.09	.10	-	1.71	1.67	2.61	4.27	-	-
	15	1.71	.61	.39	.21	-	-	.79	-	.82	.75	.60	.68	.43	.63	1.18	-	-	-
	30	.13	.37	.23	.37	.28	-	.94	-	.59	.56	-	.28	.10	.42	.21	-	-	-
	60	.12	.04	.09	.09	.19	-	.36	-	.31	.15	.13	.07	.09	.17	.35	-	-	-
	90	.11	.06	.05	.08	.19	-	.33	-	-	.20	.22	.10	.22	.35	.52	-	-	-
	120	.12	.16	.09	.13	.29	-	.26	-	.09	.08	.12	.06	.05	.21	.27	-	-	-
	150	.07	.02	.02	.04	.07	-	.16	-	.08	.27	.50	.28	.08	.25	.38	-	-	-
(B)	15	.60	.48	.10	.11	-	-	.72	-	-	.71	.42	-	.35	.46	.48	-	-	-
	30	.87	1.01	.46	.10	-	-	.66	-	.23	.45	.91	-	.18	.27	.39	-	-	-
	60	.17	.17	.05	.07	-	-	.24	-	.68	.32	.70	-	.18	.31	.14	-	-	-
	90	.08	.03	.03	.06	-	-	.30	-	.58	.37	.40	-	.13	.33	.28	-	-	-
	120	.07	.03	.03	.06	-	-	.29	-	.27	.13	.26	-	.06	.11	-	-	-	-
	150	.27	.10	.08	.06	-	-	.19	-	.14	.09	.11	-	.07	.14	.11	-	-	-

See footnotes at end of table.

TABLE 4.—*Total phosphorus in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975 Oct.	1975 Nov.	1975 Dec.	1976 Jan.	1976 Feb.	1976 Mar.	1976 Apr.	1976 May	1976 June	1976 July	1976 Aug.	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.
	Cm	*Milligrams per liter*																	
								RUPERT—Continued											
(C)	15	.44	.06	.04	.07	-	-	.75	-	-	.47	.45	.54	.67	1.40	-	-	-	-
	30	.13	.02	.09	.14	-	-	.44	-	.79	.25	.09	.12	.32	.04	.06	.06	-	-
	60	.08	.02	.04	.05	-	-	.17	-	.22	.16	.14	.10	.09	.05	-	-	-	-
	90	.03	.01	.18	.04	-	-	.28	-	.42	.24	.23	.16	.11	.04	.03	.07	-	-
	120	.06	.03	.06	.08	-	-	.14	-	.17	.29	.23	.04	.17	.03	.62	.09	-	-
	150	.04	.01	.03	.02	-	-	.12	-	.10	.06	.10	.03	.05	.04	.48	.04	-	-

Location (irrigation schedule[1])	Soil depth	1977 Apr.	1977 May	1977 June	1977 July	1977 Aug.	1977 Sept.	1977 Oct.	1977 Nov.	1977 Dec.	1978 Jan.	1978 Feb.	1978 Mar.	1978 Apr.	1978 May	1978 June	1978 July	1978 Aug.	1978 Sept.
	Cm	*Milligrams per liter*																	
								TWIN FALLS											
(A)	[2]0	-	.13	.34	.16	-	.15	-	2.31	3.10	-	-	-	.79	.94	-	.26	-	.44
	15	-	.06	.38	.41	-	.36	-	.13	.18	-	-	-	.55	-	-	-	-	-
	30	-	.12	.36	.94	-	.66	-	.38	.14	-	-	-	.28	-	-	-	-	-
	60	-	.20	.17	.06	-	.09	-	-	.06	-	-	-	.33	-	-	.10	-	-
	90	-	-	-	-	-	-	-	-	.10	-	-	-	.12	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	.08	-	-	-	-	-	-	-	-	-
	150	-	1.46	.74	.56	-	.50	-	.14	.16	-	-	-	-	-	-	.22	-	-
(B)	15	-	.35	-	-	-	.75	-	.65	.40	-	-	-	.35	-	-	-	-	1.24
	30	-	.18	.40	.59	-	.50	-	.43	.26	-	-	-	.29	-	-	-	-	1.03
	60	.08	.05	.19	-	.21	-	.09	.14	-	-	-	-	-	-	-	-	.26	
	90	-	.07	.06	.08	-	.08	-	.09	.06	-	-	-	-	-	-	-	-	.15
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.12
	150	-	-	.10	-	-	-	-	.13	-	-	-	-	-	-	-	-	-	.12
(C)	15	-	.14	.22	.18	-	-	-	.17	.11	-	-	-	-	-	-	-	-	-
	30	-	.26	.26	.15	-	-	-	.08	.06	-	-	-	-	.10	-	.11	-	.22
	60	-	.20	.20	.42	-	-	-	.16	.13	-	-	-	-	.08	-	.22	-	.12
	90	-	.12	.52	.59	-	-	-	.20	.27	-	-	-	-	-	-	.79	-	.70
	120	-	.17	.56	.52	-	-	-	.32	.36	-	-	-	-	-	-	-	-	.39
	150	-	.11	.10	.11	-	-	-	.12	.14	-	-	-	-	-	-	.06	-	.22

Location (irrigation schedule[1])	Soil depth	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.	1977 Apr.	1977 May	1977 July	1977 Aug.	1977 Nov.	1977 Dec.	1978 Mar.	1978 Apr.	1978 May	1978 July	
	Cm	*Milligrams per liter*																	
								RUPERT											
(A)	[2]0	.02	.06	.02	.12	-	.75	2.59	-	2.28	-	-	-	-	.05	.06	.10	.20	-
	15	.06	.13	.27	.37	-	.32	-	-	-	-	-	-	-	.16	.25	.32	.32	-
	30	-	-	.09	.12	-	.08	-	-	-	-	-	-	-	-	.14	.10	.19	-
	60	.07	.10	.04	.04	-	.09	-	-	-	-	-	-	-	.09	.10	.05	.10	-
	90	.09	.14	.17	.11	-	.12	-	-	-	-	-	-	-	.39	.05	.24	.21	-
	120	.16	.10	.04	.05	-	.06	-	-	-	-	-	-	-	1.30	.08	.10	.18	-
	150	.06	.06	.04	.06	-	.06	-	-	-	-	-	-	-	.20	.08	.08	.12	-
(B)	15	.28	.50	.45	.39	-	.68	.40	-	.62	-	-	-	-	.24	.15	.14	.82	-
	30	.19	.21	.11	.17	-	.15	.14	-	.12	-	-	-	-	.03	.04	.46	.06	-
	60	.06	.06	.05	.12	-	.12	.22	-	.08	-	-	-	-	-	.08	.04	.06	-
	90	.14	.11	.10	.23	-	.20	.14	-	.24	-	-	-	-	.12	.10	.07	.13	-
	120	.06	.06	.16	.06	-	.08	.07	-	.11	-	-	-	-	.11	.08	.06	.07	-
	150	.12	.06	.04	.06	-	.04	.06	-	.12	-	-	-	-	.09	.30	.26	.32	-
(C)	15	.05	.32	-	.19	-	-	.56	-	.52	-	-	-	-	2.05	-	.16	.37	-
	30	.04	.10	-	.14	-	.06	.08	-	.12	-	-	-	-	1.09	-	.03	.06	.06
	60	.06	.06	.01	.10	-	.04	.06	-	.08	-	-	-	-	.14	-	.03	.05	.08
	90	.05	.12	.11	.14	-	.08	.08	-	.27	-	-	-	-	.13	-	.04	.09	.10
	120	.03	.07	.01	.11	-	.12	.08	-	.11	-	-	-	-	.13	-	.07	.11	.12
	150	.04	.04	.02	.12	-	.09	.06	-	.08	-	-	-	-	.08	-	.11	.14	.13
								NAMPA											
(B)	[2]0	-	1.52	1.46	1.38	2.10	2.47	1.22	.95	.67	-	.32	1.70	1.85	2.94	2.54	1.81	.69	
	15	.62	.33	.28	-	.09	.48	.69	1.47	1.09	.96	.80	.16	.73	.46	.74	.57	4.93	
	30	1.41	.63	1.10	-	.63	.53	.42	1.06	.87	.84	.31	.04	.08	.50	1.72	.77	1.95	
	60	1.23	-	.83	-	.41	.36	.61	1.02	1.08	1.20	.80	.42	.26	1.10	2.20	1.36	4.56	
	90	1.17	-	1.25	.33	.18	.30	-	.41	.68	.73	.74	.26	.21	.34	.72	.40	.22	
	120	.45	.29	.39	.28	.46	.56	.62	.19	.18	.28	.20	.11	.12	.51	.93	.80	3.28	
	150	.40	.24	.31	.44	.26	.29	.17	.20	.18	.20	.19	.15	.13	.19	.44	.12	.19	
(C)	15	-	2.22	1.49	1.08	2.38	-	.92	1.88	1.63	1.76	2.27	.81	-	1.42	1.18	.64	1.68	
	30	4.30	1.51	.97	1.01	1.54	-	-	1.92	1.28	2.56	2.45	.90	-	.89	1.04	.74	2.36	
	60	1.46	1.70	1.36	1.21	-	.74	1.34	1.56	1.33	1.90	2.56	1.26	1.47	1.24	1.69	.86	3.45	
	90	2.11	1.63	1.20	.84	-	1.79	.20	1.34	1.44	1.69	2.30	.89	-	.49	1.14	1.02	3.41	
	120	.84	.72	.81	.42	-	-	.17	.71	.51	.50	.45	.35	-	.21	.58	.84	.28	
	150	1.00	1.29	1.16	1.24	.96	-	.37	.94	1.00	1.03	1.18	1.04	.90	.63	.87	.81	1.82	

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 5.—*Potassium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975 Oct.	1975 Nov.	1975 Dec.	1976 Jan.	1976 Feb.	1976 Mar.	1976 Apr.	1976 May	1976 June	1976 July	1976 Aug.	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.
	Cm	*Milliequivalents per liter*																	
								TWIN FALLS											
(A)	[2]0	-	13.2	7.5	5.9	6.4	4.9	3.3	0	0.1	0.1	-	-	-	5.4	7.2	6.1	5.5	2.9
	15	-	9.8	6.8	-	-	4.6	-	9.5	9.9	17.0	-	-	-	6.0	-	-	-	2.2
	30	-	3.7	6.2	5.4	4.2	6.8	3.6	-	-	31.9	-	-	-	12.8	13.5	-	-	6.0
	60	-	8.1	8.1	4.1	4.8	5.8	-	-	9.9	8.8	-	-	-	6.6	3.2	4.4	-	5.6
	90	-	10.0	9.4	5.3	4.6	6.2	4.8	.1	1.0	1.5	-	-	-	2.7	2.4	1.6	-	3.4
	120	-	8.0	6.0	4.4	-	4.1	4.6	-	.3	2.0	-	-	-	2.1	2.4	1.7	-	3.5
	150	-	2.1	6.8	4.2	-	6.0	3.3	.2	.4	.3	-	-	-	1.6	3.8	-	-	-
(B)	15	-	2.0	6.3	2.9	-	2.0	-	-	-	-	-	-	-	-	-	4.2	3.6	-
	30	-	-	1.8	.0.8	-	1.9	2.5	-	8.0	-	-	-	-	5.2	3.6	3.7	-	-
	60	-	.6	3.0	2.1	-	3.4	3.0	-	3.0	3.8	-	-	-	3.4	4.0	3.0	-	1.1
	90	-	.5	5.1	3.0	-	4.5	-	-	.8	2.1	-	-	-	.2	1.5	2.5	2.6	.9
	120	-	.1	6.2	3.3	-	3.4	1.8	-	.2	.3	-	-	-	.5	1.5	2.8	-	1.5
	150	-	.1	4.8	2.9	-	4.8	3.9	-	.1	.2	-	-	-	2.6	2.7	3.5	-	2.1
(C)	15	-	3.6	3.2	2.3	-	4.8	3.4	-	4.0	1.5	-	-	-	3.0	4.0	-	4.3	-
	30	-	1.3	1.8	2.2	-	2.0	1.7	-	2.9	1.5	-	-	-	2.6	3.5	3.3	4.4	2.4
	60	-	2.0	3.4	2.2	-	6.0	2.8	-	2.2	2.0	-	-	-	2.4	2.9	2.4	3.3	2.6
	90	-	1.0	3.1	2.1	-	6.0	2.5	-	.3	0.9	-	-	-	2.4	3.6	4.4	4.4	-
	120	-	1.1	2.3	1.8	-	3.0	2.4	-	.1	0.4	-	-	-	.8	4.8	3.4	2.8	2.5
	150	-	1.4	4.7	3.0	-	4.2	3.4	-	.1	0.1	-	-	-	.9	2.2	1.7	1.6	1.5
								RUPERT											
(A)	[2]0	5.25	2.30	7.30	1.61	2.90	-	.18	-	.08	.14	.18	-	1.61	1.75	3.23	3.83	-	-
	15	.43	.41	.90	.08	-	-	.98	-	.85	.50	.32	.29	.86	1.49	1.23	-	-	-
	30	.17	.44	.32	.69	.73	-	1.00	-	1.25	.44	-	.31	.64	1.33	1.05	-	-	-
	60	.12	.14	.12	.09	.32	-	.45	-	.30	.23	.18	.16	.18	.63	.69	-	-	-
	90	.09	.10	.18	.63	1.50	-	.60	-	.80	.40	.44	.40	.67	.58	.84	-	-	-
	120	.11	.19	.26	.45	.59	-	.68	-	.37	.35	.39	.34	.30	.44	.39	-	-	-
	150	.13	.13	.11	.06	.09	-	.10	-	.28	.17	.17	.15	.14	.14	.07	-	-	-
(B)	15	.38	.06	.50	.22	-	-	.60	-	-	.54	.26	-	.26	.75	1.00	-	-	-
	30	.26	.35	.31	-	-	-	.40	-	.12	.22	.18	-	.11	.25	.45	-	-	-
	60	.09	.38	.18	.18	-	-	.25	-	1.20	.31	.45	-	.30	.81	.57	-	-	-
	90	.08	.04	.08	.13	-	-	.30	-	.38	.17	.13	-	.13	.43	.44	-	-	-
	120	.09	.11	.39	.24	-	-	.28	-	.25	.24	.31	-	.33	.82	.57	-	-	-
	150	.16	.15	.28	.11	-	-	.08	-	.18	.19	.18	-	.16	.18	.09	-	-	-

Location (irrigation schedule[1])	Soil depth	1977 Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1978 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
(C)	15	.20	.12	.08	.05	-	-	.25	-	-	.16	.13	.12	.58	.85	-	-	-	-
	30	.12	.03	-	.25	-	-	.20	-	.15	.11	.13	.09	.07	.28	.07	.19	-	-
	60	.06	.06	.04	.10	-	-	.15	-	.11	.12	.48	.33	.11	.08	.01	-	-	-
	90	.05	.01	.08	.03	-	-	.05	-	.15	.10	.10	.06	.07	.14	.25	.50	-	-
	120	.06	.04	.05	.15	-	-	.07	-	.18	.15	.13	.12	.12	.07	.51	.15	-	-
	150	.06	.10	.10	.11	-	-	.06	-	.10	.14	.17	.17	.13	.11	.02	.10	-	-
	Cm							*Milliequivalents per liter*											
								TWIN FALLS											
(A)	[2]0	-	.1	.1	.7	.1	.1	-	5.4	5.7	-	-	-	3.0	1.1	-	.1	.8	.1
	15	-	-	4.8	3.6	-	3.2	-	4.6	4.4	-	-	-	3.5	-	-	-	-	-
	30	-	5.8	6.0	4.1	-	2.7	-	5.8	4.4	-	-	-	3.9	-	-	-	-	-
	60	-	3.7	2.1	3.8	-	2.2	-	-	2.6	-	-	-	-	-	-	-	-	-
	90	-	-	-	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	-
	150	-	.1	.2	.4	-	.4	-	4.0	2.8	-	-	-	-	-	-	-	-	-
(B)	15	-	6.1	-	6.2	-	4.6	-	5.2	5.6	-	-	-	3.9	-	-	-	-	2.0
	30	-	4.7	7.1	4.1	-	3.2	-	4.5	5.2	-	-	-	4.0	-	-	3.3	-	1.6
	60	-	5.4	6.7	3.7	-	2.7	-	4.4	4.3	-	-	-	3.5	-	-	3.0	-	1.5
	90	-	3.5	3.8	2.3	-	1.8	-	2.7	2.1	-	-	-	3.9	-	-	3.5	-	1.3
	120	-	-	.6	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	1.8
	150	-	-	-	3.2	-	3.1	-	-	-	-	-	-	3.8	-	-	-	-	1.3
(C)	15	-	1.8	1.5	1.4	-	-	-	3.5	3.6	-	-	-	-	-	-	-	-	-
	30	-	1.9	1.6	1.8	-	-	-	3.4	3.0	-	-	-	-	2.7	-	2.6	-	1.8
	60	-	2.0	1.7	1.9	-	-	-	3.6	2.7	-	-	-	-	2.3	-	1.9	-	1.9
	90	-	1.1	1.5	1.2	-	-	-	4.2	3.0	-	-	-	-	2.4	-	2.1	-	1.5
	120	-	1.5	1.0	1.4	-	-	-	2.3	2.9	-	-	-	-	1.8	-	1.9	-	1.4
	150	-	1.2	1.3	1.2	-	-	-	3.3	2.9	-	-	-	-	2.4	-	2.7	-	1.7
								RUPERT											
(A)	[2]0	.15	.14	.13	.13	-	3.78	2.39	-	1.84	-	-	-	-	.89	.13	.16	.14	-
	15	1.16	.76	.88	.49	-	1.33	-	-	-	-	-	-	-	2.84	2.21	2.24	2.25	-
	30	-	-	.84	.73	-	-	-	-	-	-	-	-	-	-	1.74	2.42	2.16	-
	60	1.17	1.11	1.20	1.11	-	.97	-	-	-	-	-	-	-	3.35	3.27	3.12	1.91	-
	90	.70	1.03	.84	.80	-	.68	-	-	-	-	-	-	-	1.67	.89	2.09	1.35	-
	120	.57	.28	.66	.60	-	.69	-	-	-	-	-	-	-	2.81	3.03	3.09	2.69	-
	150	.10	.13	.14	.14	-	.17	-	-	-	-	-	-	-	.51	.50	.62	.94	-
(B)	15	.88	.61	.53	.71	-	3.31	3.21	-	3.23	-	-	-	-	2.12	1.95	1.94	1.67	-
	30	-	.33	.34	.34	-	.55	.59	-	.70	-	-	-	-	1.35	.78	.91	1.17	-
	60	-	1.04	.84	.83	-	.91	1.42	-	2.36	-	-	-	-	2.50	2.08	1.61	1.76	-
	90	.51	.47	.45	.49	-	.47	.93	-	2.96	-	-	-	-	3.90	3.13	2.59	2.02	-
	120	-	.54	.47	.60	-	.53	1.19	-	2.63	-	-	-	-	2.41	3.11	2.94	2.43	-
	150	.16	.19	.19	.24	-	.18	.32	-	.62	-	-	-	-	.74	.51	.57	.56	-

See footnotes at end of table.

TABLE 5.—*Potassium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
RUPERT—Continued																			
(C)	15	1.00	.46	-	.28	-	-	2.97	-	3.63	-	-	-	-	-	-	2.34	2.53	-
	30	.25	.15	-	.15	-	.13	1.13	-	1.17	-	-	-	-	1.62	-	1.33	1.29	1.18
	60	.09	.14	.07	.08	-	.08	.29	-	.77	-	-	-	-	1.23	-	1.06	.98	.86
	90	.64	.42	.51	.40	-	.35	.70	-	3.61	-	-	-	-	6.03	-	2.85	4.18	1.79
	120	.13	.38	.64	.60	-	.63	.88	-	.77	-	-	-	-	.90	-	.84	.94	1.16
	150	.08	.07	.08	.07	-	.11	.16	-	.24	-	-	-	-	.30	-	.23	.24	.24

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar	Apr.	May	July
	Cm	*Milliequivalents per liter*																
NAMPA																		
(B)	[2]0	-	6.82	4.32	7.39	6.61	10.59	3.84	7.05	8.04	-	.25	3.31	3.15	8.65	9.11	14.8	.91
	15	.02	.02	1.13	.50	1.70	5.26	7.50	4.93	7.60	2.45	2.50	4.21	3.80	6.66	8.46	14.44	4.21
	30	.07	.94	.10	.10	1.06	.75	1.95	2.69	3.97	1.40	1.45	3.55	3.37	6.68	7.88	12.14	3.05
	60	.04	.05	.06	.07	.68	1.55	2.38	2.03	5.18	2.41	1.79	2.75	3.82	6.08	9.03	8.19	4.32
	90	.08	.08	.10	-	.05	.05	-	.42	.42	.05	.06	.18	.32	.94	.86	.96	2.61
	120	.07	.02	.02	.01	1.13	1.90	.07	.07	.06	.07	.07	.68	.99	4.23	4.52	5.29	1.65
	150	.03	.01	.02	.01	.03	.07	.07	.05	.04	.05	.06	.04	.05	.11	.29	.23	.08
(C)	15	-	1.98	4.05	5.11	2.40	-	3.15	3.48	7.57	1.77	1.56	4.60	-	8.82	5.34	13.88	2.73
	30	.12	.80	3.95	5.85	-	-	-	3.81	8.99	2.49	2.10	5.39	2.89	8.30	5.34	11.90	2.97
	60	.14	.25	4.03	.60	.86	1.15	2.25	2.50	7.08	2.09	1.54	3.59	2.73	7.00	5.09	9.70	3.05
	90	.09	.18	.73	2.75	-	2.20	1.80	1.78	3.46	1.84	1.08	2.81	2.32	7.18	5.29	8.50	4.34
	120	.07	.13	.13	-	4.15	-	.12	.12	.17	.12	.06	.10	-	.56	.88	.93	1.55
	150	.07	.05	.08	.05	1.11	-	.60	.28	.23	.20	.12	.15	.20	.29	.13	.17	.13

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 6.—*Electrical conductivity of sugarbeet processing waste water and of water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Millimhos per centimeter*[2]																	
								TWIN FALLS											
(A)	[2]0	-	6.8	3.9	2.9	3.0	3.0	2.6	0.3	0.3	0.3	-	-	-	2.7	4.0	4.2	3.8	3.4
	15	-	6.4	5.0	-	-	2.6	-	6.4	-	5.8	-	-	-	7.0	-	-	-	3.3
	30	-	5.3	5.1	4.3	4.2	3.1	2.8	9.4	-	1.5	-	-	-	10.0	10.0	-	-	5.4
	60	1.8	5.7	5.5	4.4	4.5	3.5	2.4	2.8	-	5.1	-	-	-	6.4	4.4	10.0	-	6.0
	90	.9	4.7	5.3	4.5	4.3	2.7	2.9	2.5	2.1	2.2	-	-	-	3.3	3.4	4.7	3.1	4.5
	120	1.3	4.4	5.1	4.3	3.8	2.7	3.6	2.4	2.3	-	-	-	-	2.3	2.4	3.0	-	4.7
	150	1.2	4.3	5.2	4.4	-	3.1	2.7	2.7	-	3.0	-	-	-	3.8	4.1	-	5.0	-
(B)	15	3.6	2.4	4.0	3.0	-	2.4	1.8	-	8.2	-	-	-	-	-	-	4.3	5.4	-
	30	-	-	2.5	1.8	-	2.1	1.8	-	7.2	-	-	-	-	5.3	2.6	3.6	-	3.7
	60	-	2.0	4.2	4.0	-	2.4	2.0	-	3.8	5.0	-	-	-	4.6	3.7	4.3	2.9	3.5
	90	1.2	2.9	4.5	4.0	-	2.7	1.9	-	2.1	2.9	-	-	-	2.0	3.6	3.2	3.1	3.6
	120	-	.9	4.7	4.2	-	3.0	2.7	-	1.8	1.8	-	-	-	2.7	3.0	3.8	-	3.6
	150	1.2	1.3	4.7	3.5	-	3.1	2.8	-	1.8	2.1	-	-	-	3.3	2.8	3.4	-	3.1
(C)	15	1.6	6.7	4.0	3.0	-	2.7	2.4	-	3.2	1.4	-	-	-	2.6	2.9	-	3.8	3.2
	30	-	2.9	2.9	3.0	-	2.2	2.7	-	2.3	1.1	-	-	-	2.7	3.0	3.5	4.0	3.2
	60	1.0	4.9	4.6	2.9	-	3.3	2.9	-	2.3	2.0	-	-	-	2.6	2.6	3.0	3.2	3.2
	90	1.0	3.3	4.5	3.5	-	3.4	2.4	-	2.1	1.4	-	-	-	2.8	3.0	4.0	3.6	3.5
	120	1.3	3.4	4.1	3.0	-	2.8	2.4	-	1.6	1.4	-	-	-	2.6	3.7	4.0	3.7	3.6
	150	1.6	3.6	5.0	3.6	-	2.5	2.4	-	1.5	1.7	-	-	-	2.7	3.6	3.0	2.9	3.3
								RUPERT											
(A)	[2]0	-	2.0	3.2	2.9	2.4	-	.6	-	.4	.5	.5	-	1.1	1.0	1.4	1.9	-	-
	15	1.7	2.0	2.3	2.0	-	-	1.0	-	1.2	1.0	.7	.8	1.8	2.5	1.7	-	-	-
	30	1.9	2.6	2.3	1.9	2.3	-	1.1	-	1.9	1.7	-	1.4	1.5	2.7	1.4	-	-	-
	60	1.7	2.3	2.3	2.0	2.4	-	1.5	-	1.4	1.6	1.4	1.5	1.5	2.7	1.6	-	-	-
	90	1.4	2.0	2.3	2.0	2.4	-	1.7	-	1.6	1.7	1.7	2.0	1.5	2.4	1.7	-	-	-
	120	1.7	2.3	2.0	2.0	2.8	-	1.7	-	1.8	1.8	1.7	2.0	1.6	2.6	1.7	-	-	-
	150	1.3	1.5	1.6	1.9	1.8	-	1.9	-	1.5	1.9	1.4	1.9	1.5	2.3	2.2	-	-	-
(B)	15	1.8	2.2	1.8	-	-	-	1.2	-	-	1.5	.7	-	.9	2.9	1.4	-	-	-
	30	1.7	1.7	1.7	1.4	-	-	1.3	-	1.6	1.6	1.6	-	1.3	2.4	1.5	-	-	-
	60	1.7	2.3	2.0	1.9	-	-	1.7	-	1.7	1.9	2.1	-	1.5	2.6	1.5	-	-	-
	90	1.8	1.9	1.8	2.1	-	-	1.5	-	1.6	1.8	1.8	-	1.4	2.3	1.6	-	-	-
	120	1.4	1.8	1.9	2.1	-	-	1.8	-	1.6	1.7	1.7	-	1.3	2.7	1.7	-	-	
	150	1.3	1.9	1.8	1.5	-	-	2.0	-	1.5	1.6	1.4	-	1.4	2.2	2.0	-	-	-

See footnotes at end of table.

TABLE 6.—*Electrical conductivity of sugarbeet processing waste water and of water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Millimhos per centimeter*[2]																	
								RUPERT—Continued											
(C)	15	1.8	1.6	1.7	1.4	-	-	1.0	-	-	1.0	1.1	.9	.6	2.1	-	-	-	-
	30	1.6	2.3	1.3	2.2	-	-	1.6	-	1.2	1.3	2.3	1.5	1.1	2.2	1.4	1.5	-	-
	60	1.8	2.5	2.4	2.2	-	-	1.7	-	1.4	1.9	1.7	1.7	1.3	1.6	1.3	-	-	-
	90	1.8	1.4	2.0	1.9	-	-	1.9	-	1.3	1.5	1.5	1.6	1.3	1.7	1.8	1.6	-	-
	120	1.5	1.6	1.6	1.8	-	-	1.8	-	1.5	1.5	1.7	1.7	1.3	1.4	1.5	2.0	-	-
	150	1.2	1.3	1.3	1.5	-	-	2.2	-	1.6	1.8	1.6	1.9	1.0	1.5	1.9	1.9	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Millimhos per centimeter*[2]																	
									TWIN FALLS										
(A)	10	-	.5	.7	.5	-	.5	-	3.4	3.7	-	-	-	2.9	2.2	-	.4	-	.5
	15	-	2.4	2.2	1.1	-	1.2	-	2.1	2.6	-	-	-	-	-	-	-	-	-
	30	-	4.7	-	1.4	-	.9	-	2.2	2.7	-	-	-	2.4	-	-	-	-	-
	60	-	2.4	1.0	2.0	-	3.2	-	-	2.2	-	-	-	-	-	-	2.0	-	-
	90	-	-	-	-	-	-	-	-	2.1	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-	-	-
	150	-	3.0	2.6	2.6	-	3.0	-	3.0	2.1	-	-	-	-	-	-	2.0	-	-
(B)	15	-	7.1	-	-	-	-	-	3.3	3.7	-	-	-	2.3	-	-	-	-	.9
	30	-	4.9	5.3	2.4	-	1.6	-	2.7	4.4	-	-	-	2.6	-	-	1.9	-	.9
	60	-	5.1	5.0	2.1	-	1.3	-	3.2	3.0	-	-	-	3.0	-	-	1.7	-	1.2
	90	-	3.5	3.9	2.4	-	1.7	-	2.8	3.6	-	-	-	2.9	-	-	2.3	-	1.4
	120	-	-	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.0
	150	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	-	-	.9
(C)	15	-	1.6	1.0	.8	-	-	-	2.9	2.8	-	-	-	-	-	-	-	-	-
	30	-	1.6	1.1	1.1	-	-	-	2.8	2.2	-	-	-	-	2.1	-	2.1	-	1.4
	60	-	1.9	.9	1.2	-	-	-	2.9	2.4	-	-	-	-	2.3	-	2.5	-	1.7
	90	-	1.7	.8	.9	-	-	-	2.9	2.7	-	-	-	-	-	-	1.2	-	1.1
	120	-	1.4	1.3	1.7	-	-	-	2.7	2.8	-	-	-	-	2.1	-	2.4	-	2.0
	150	-	1.9	.7	1.1	-	-	-	3.0	2.8	-	-	-	-	2.1	-	1.8	-	1.7

Location (irrigation schedule[1])	Soil depth	1976				1977									1978				
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July	
	Cm	*Millimhos per centimeter*[2]																	
		RUPERT																	
(A)	[2]0	.6	.6	.6	.6	1.7	-	1.6	-	1.6	-	-	-	-	.6	.6	.6	.7	-
	15	1.3	1.3	.8	.8	1.8	-	-	-	-	-	-	-	-	2.0	1.3	1.2	1.2	-
	30	-	-	.9	-	-	-	-	-	-	-	-	-	-	-	1.4	1.6	1.5	-
	60	1.7	1.7	1.4	1.1	1.1	-	-	-	-	-	-	-	-	2.6	2.8	2.7	1.5	-
	90	1.6	1.7	1.3	1.2	1.2	-	-	-	-	-	-	-	-	2.1	2.7	2.3	1.9	-
	120	1.5	1.6	1.3	1.2	1.1	-	-	-	-	-	-	-	-	2.3	2.7	2.5	2.0	-
	150	1.6	1.4	1.3	1.3	1.2	-	-	-	-	-	-	-	-	2.3	2.6	2.6	2.0	-
(B)	15	1.2	1.0	.8	.8	2.1	-	2.8	-	2.9	-	-	-	-	1.9	1.3	1.4	1.4	-
	30	1.5	1.4	1.3	1.0	3.2	-	2.8	-	2.7	-	-	-	-	2.2	2.3	2.6	2.4	-
	60	1.3	1.3	.9	.9	1.0	-	2.3	-	3.0	-	-	-	-	2.2	2.1	1.7	1.7	-
	90	1.4	1.5	1.5	1.1	1.3	-	2.1	-	3.2	-	-	-	-	3.6	2.7	2.1	1.8	-
	120	1.4	1.2	.9	.9	1.2	-	2.3	-	3.3	-	-	-	-	3.1	3.0	2.7	2.4	-
	150	1.5	1.5	1.0	.9	1.6	-	1.7	-	3.0	-	-	-	-	2.7	2.3	2.2	2.2	-
(C)	15	1.0	.8	-	-	-	-	3.1	-	2.7	-	-	-	-	-	-	2.0	2.4	-
	30	1.1	.9	-	1.1	2.1	-	2.9	-	3.0	-	-	-	-	2.6	-	2.5	2.0	-
	60	1.3	1.1	1.1	1.1	2.0	-	3.0	-	3.0	-	-	-	-	3.5	-	2.6	3.5	4.5
	90	1.2	1.1	1.5	1.3	1.4	-	2.7	-	3.1	-	-	-	-	4.6	-	4.1	4.0	4.0
	120	1.1	1.2	1.2	1.3	1.5	-	2.8	-	2.4	-	-	-	-	2.5	-	2.9	2.9	4.3
	150	1.4	1.1	1.2	1.1	1.4	-	2.5	-	3.0	-	-	-	-	2.5	-	2.6	2.7	2.8
		NAMPA																	
(B)	[2]0	-	3.1	3.7	4.1	4.3	4.6	2.4	2.2	3.7	-	.8	2.1	2.1	3.9	3.4	4.8	.6	
	15	.4	3.2	3.0	-	4.6	4.7	3.9	3.0	4.4	1.0	.9	2.2	2.2	3.7	3.7	6.2	1.3	
	30	.4	2.6	3.3	3.8	2.5	4.6	3.7	2.7	4.5	1.1	1.1	2.7	2.3	3.7	3.9	5.9	1.3	
	60	.4	1.0	2.0	3.6	3.9	4.6	2.6	2.7	4.4	1.3	.9	1.9	2.9	3.5	4.2	4.9	1.3	
	90	.5	.7	1.3	-	3.8	5.0	3.1	2.8	3.6	2.2	3.3	2.1	2.3	3.4	3.8	4.0	3.0	
	120	.5	.5	.6	1.4	3.6	4.9	4.5	3.0	3.2	4.5	6.0	2.6	2.3	3.2	4.1	4.4	2.2	
	150	.5	.6	.7	1.2	3.4	4.3	4.7	3.3	3.2	3.8	5.1	3.4	2.4	3.0	4.1	3.8	4.0	
(C)	15	-	3.3	3.2	3.9	5.1	-	3.6	2.5	6.2	.9	.7	2.9	-	4.2	2.8	7.6	.9	
	30	.5	3.4	3.4	4.3	-	-	-	2.6	6.2	1.1	.7	3.0	2.2	4.3	2.9	8.7	1.1	
	60	.6	3.4	3.5	4.0	3.8	3.8	-	3.0	6.0	1.6	.7	2.9	2.2	4.2	3.0	7.1	1.5	
	90	.7	3.1	3.9	4.0	-	4.2	3.7	3.1	5.4	2.2	.9	3.0	2.0	4.1	3.1	5.7	2.5	
	120	.6	1.8	3.0	4.0	3.8	-	3.6	3.3	5.7	5.0	2.5	2.7	-	3.8	3.2	3.5	5.8	
	150	.6	1.8	2.5	3.6	3.4	-	3.8	3.1	4.0	4.3	2.9	1.6	2.0	3.8	3.8	3.9	4.1	

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 7.—*Calcium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975 Oct.	1975 Nov.	1975 Dec.	1976 Jan.	1976 Feb.	1976 Mar.	1976 Apr.	1976 May	1976 June	1976 July	1976 Aug.	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.
	Cm	*Milliequivalents per liter*																	
									TWIN FALLS										
(A)	[2]0	-	2.0	10.9	12.4	9.5	26.0	22.2	1.9	1.5	1.8	-	-	-	9.1	17.4	26.0	26.4	14.3
	15	-	28.9	26.8	-	-	7.8	-	-	31.0	30.8	-	-	-	44.4	-	-	-	15.8
	30	-	29.3	29.9	14.9	23.3	18.0	6.4	-	-	39.0	-	-	-	41.0	25.4	-	-	30.2
	60	3.8	26.3	31.9	20.2	28.4	20.3	8.0	-	11.3	20.0	-	-	-	30.3	58.3	93.6	-	39.7
	90	5.5	25.2	31.8	25.9	24.8	19.1	15.3	21.4	9.9	5.7	-	-	-	11.7	25.4	18.2	-	28.8
	120	1.9	19.4	33.1	16.5	-	7.6	17.4	13.5	5.9	3.5	-	-	-	1.5	13.7	7.9	-	29.8
	150	1.2	41.5	27.0	17.9	-	15.6	15.0	14.6	7.1	9.0	-	-	-	3.6	40.0	-	-	-
(B)	15	23.0	6.1	15.6	5.8	-	5.9	-	-	-	-	-	-	-	7.7	17.9	13.6	25.6	-
	30	-	-	3.0	2.7	-	4.3	-	-	37.8	-	-	-	-	34.7	25.6	9.8	-	21.4
	60	-	7.4	24.8	10.4	-	8.9	8.4	-	21.3	25.2	-	-	-	31.3	26.2	28.6	-	18.8
	90	2.0	4.3	29.4	13.6	-	13.5	-	-	6.3	6.2	-	-	-	14.5	20.7	18.9	5.8	19.2
	120	-	.8	30.7	21.9	-	19.9	.9	-	1.3	1.0	-	-	-	16.1	24.0	20.9	-	19.6
	150	.7	1.1	26.2	16.0	-	23.3	16.8	-	7.2	4.1	-	-	-	15.4	24.1	21.2	-	16.6
(C)	15	8.1	-	21.2	17.1	-	20.2	9.1	-	19.5	7.9	-	-	-	14.3	25.1	-	23.0	17.6
	30	-	32.4	14.1	15.9	-	6.9	20.5	-	14.0	5.2	-	-	-	16.7	29.4	25.9	26.2	19.0
	60	4.4	37.0	25.8	7.1	-	27.8	9.2	-	14.7	10.2	-	-	-	9.0	19.3	19.5	16.2	19.2
	90	2.4	21.2	25.6	17.4	-	25.9	17.0	-	7.4	8.3	-	-	-	24.7	26.5	31.3	-	18.6
	120	1.6	21.9	22.3	18.2	-	17.1	19.3	-	5.9	6.1	-	-	-	17.5	35.9	32.9	19.3	21.0
	150	1.7	20.8	30.1	21.7	-	11.3	15.8	-	4.2	5.9	-	-	-	15.6	33.4	17.5	3.0	18.8
									RUPERT										
(A)	[2]0	19.6	6.2	3.6	16.3	13.5	-	4.3	-	2.7	2.8	3.1	-	4.9	4.0	5.3	7.4	-	-
	15	10.9	5.7	6.4	10.8	-	-	9.0	-	8.1	6.5	4.5	5.7	16.0	17.1	11.5	-	-	-
	30	2.6	12.1	7.9	9.0	-	-	5.6	-	13.1	7.9	-	8.3	9.2	16.7	8.9	-	-	-
	60	8.4	8.0	5.8	7.3	-	-	8.2	-	9.4	8.9	7.8	8.1	11.9	14.2	14.5	-	-	-
	90	8.6	6.4	6.1	8.7	-	-	12.0	-	-	9.7	8.0	10.5	10.9	10.9	16.4	-	-	-
	120	11.5	9.2	5.3	9.6	-	-	10.5	-	11.9	8.5	9.1	10.9	12.3	13.4	13.9	-	-	-
	150	8.2	3.6	3.7	5.8	-	-	12.1	-	7.0	7.6	5.4	10.3	6.4	11.8	17.3	-	-	-
(B)	15	10.5	4.9	2.9	2.8	-	-	8.2	-	-	10.4	4.7	-	7.5	22.2	5.5	-	-	-
	30	8.0	3.0	2.2	-	-	-	9.8	-	10.6	10.1	10.3	-	7.6	10.8	9.1	-	-	-
	60	11.8	9.7	5.3	7.2	-	-	12.3	-	11.9	8.6	12.8	-	14.7	19.6	8.9	-	-	-
	90	12.3	5.1	3.1	9.2	-	-	11.6	-	10.9	9.3	9.3	-	9.6	15.9	8.5	-	-	-
	120	9.1	8.0	6.3	9.2	-	-	13.3	-	10.0	8.2	5.7	-	8.1	21.4	9.5	-	-	-
	150	8.4	6.0	4.5	6.0	-	-	18.9	-	9.6	7.4	6.3	-	5.2	13.2	12.7	-	-	-
(C)	15	11.0	1.3	3.6	5.9			6.0			5.0	6.7	5.8	5.0	3.5	5.0			

(C)	15	11.0	1.3	3.6	5.9	-	-	6.0	-	-	5.9	6.7	5.8	5.9	3.5	5.9	-	-	-
	30	8.2	8.5	-	8.8	11.7	-	11.3	-	8.8	7.9	12.1	8.9	8.8	8.5	7.2	3.9	-	-
	60	11.2	9.0	6.9	12.2	12.4	-	11.2	-	8.6	8.8	8.4	10.8	10.1	22.6	9.0	-	-	-
	90	12.3	1.7	4.0	5.2	10.1	-	13.3	-	9.6	7.8	9.0	11.0	10.7	11.6	8.4	8.3	-	-
	120	10.1	6.2	3.5	8.3	16.6	-	14.1	-	12.3	8.6	6.4	9.0	10.3	22.6	6.6	11.2	-	-
	150	7.2	4.2	4.9	5.1	5.2	-	17.5	-	10.3	7.3	7.0	10.0	10.8	17.5	13.7	11.5	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milliequivalents per liter*																	
									TWIN FALLS										
(A)	[2]0	-	2.3	2.2	2.5	2.4	2.6	-	18.0	16.5	-	-	-	7.5	2.3	-	2.5	2.1	2.2
	15	-	-	9.5	4.4	-	4.6	-	7.6	10.2	-	-	-	3.6	-	-	-	-	-
	30	-	20.8	-	6.0	-	3.2	-	7.9	3.5	-	-	-	5.8	-	-	-	-	-
	60	-	10.6	4.7	5.5	-	6.6	-	-	3.5	-	-	-	-	-	-	-	-	-
	90	-	-	-	-	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	150	-	7.9	8.9	11.3	-	6.5	-	18.4	4.2	-	-	-	2.0	-	-	-	-	-
(B)	15	-	39.1	-	-	-	16.3	0	18.3	16.6	-	-	-	10.6	-	-	-	-	3.0
	30	-	24.8	31.3	-	12.0	7.2	-	15.5	18.7	-	-	-	11.7	-	-	7.3	-	2.5
	60	-	18.4	27.7	-	10.4	6.0	-	18.0	19.0	-	-	-	11.6	-	-	5.8	-	4.3
	90	-	-	20.0	-	12.0	8.8	-	19.3	11.9	-	-	-	12.6	-	-	8.3	-	4.6
	120	-	-	15.6	-	-	-	-	-	-	-	-	-	7.7	-	-	-	-	33.0
	150	-	11.4	-	-	-	6.5	-	-	-	-	-	-	6.8	-	-	-	-	2.7
(C)	15	-	6.8	6.0	-	3.5	-	-	19.9	9.5	-	-	-	-	-	-	-	-	-
	30	-	6.4	4.7	-	4.6	-	-	19.4	5.2	-	-	-	-	6.7	-	5.1	-	5.2
	60	-	8.0	4.3	-	5.7	-	-	17.3	1.7	-	-	-	-	8.3	-	8.2	-	6.0
	90	-	6.0	4.4	-	5.0	-	-	16.2	10.4	-	-	-	-	-	-	4.3	-	5.5
	120	-	4.6	3.3	-	7.1	-	-	9.9	7.1	-	-	-	-	3.6	-	7.2	-	8.7
	150	-	4.4	2.7	-	6.7	-	-	14.7	10.8	-	-	-	-	2.4	-	4.2	-	9.4
									RUPERT										
(A)	[2]0	2.9	3.0	3.1	3.3	-	3.2	4.6	-	3.8	-	-	-	-	2.8	3.2	3.3	3.4	-
	15	7.0	7.1	4.9	4.6	9.6	-	-	-	-	-	-	-	-	8.2	6.2	5.6	6.3	-
	30	-	-	4.8	4.6	-	-	-	-	-	-	-	-	-	-	6.3	7.0	7.0	-
	60	10.0	7.5	7.0	5.3	6.4	-	-	-	-	-	-	-	-	15.9	16.0	13.3	9.8	-
	90	8.0	7.7	6.1	6.0	7.1	-	-	-	-	-	-	-	-	9.1	16.5	12.6	10.7	-
	120	8.2	6.6	6.8	5.4	6.4	-	-	-	-	-	-	-	-	10.5	13.3	10.1	10.9	-
	150	6.2	4.5	4.6	4.4	6.4	-	-	-	-	-	-	-	-	12.6	13.6	9.8	10.1	-
(B)	15	7.5	5.9	5.1	4.8	7.9	-	15.9	-	9.8	-	-	-	-	6.1	6.2	5.7	6.2	-
	30	8.4	7.0	5.4	1.9	11.4	-	16.3	-	9.0	-	-	-	-	9.3	12.2	11.3	13.2	-
	60	5.8	5.4	3.4	3.5	5.3	-	14.6	-	10.3	-	-	-	-	11.4	16.0	9.4	9.1	-
	90	8.8	7.2	5.7	5.9	8.7	-	13.3	-	8.9	-	-	-	-	19.1	12.5	11.7	10.5	-
	120	6.1	4.3	3.7	2.9	6.9	-	14.1	-	9.6	-	-	-	-	11.9	18.2	14.6	12.3	-
	150	7.3	6.6	2.5	3.1	5.8	-	8.7	-	6.7	-	-	-	-	7.9	15.4	9.4	10.5	-

See footnotes at end of table.

TABLE 7.—*Calcium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
								RUPERT—Continued											
(C)	15	5.9	4.4	-	-	-	-	20.1	-	9.1	-	-	-	-	-	-	4.8	7.3	-
	30	6.5	5.1	-	6.5	12.4	-	19.3	-	8.6	-	-	-	-	13.1	-	12.1	6.8	20.0
	60	5.2	5.9	3.7	4.6	10.0	-	18.3	-	8.5	-	-	-	-	19.6	-	19.4	18.0	13.0
	90	7.0	6.2	8.4	5.9	8.1	-	17.3	-	6.9	-	-	-	-	25.5	-	24.5	23.0	14.5
	120	8.6	5.8	3.3	5.4	8.2	-	13.4	-	5.1	-	-	-	-	11.1	-	14.0	9.5	10.0
	150	6.4	5.6	5.5	3.5	7.2	-	12.2	-	11.7	-	-	-	-	10.7	-	9.3	6.5	10.1

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm	*Milliequivalents per liter*																
								NAMPA										
(B)	[2]0	-	6.0	12.9	9.1	16.5	8.2	4.7	1.9	3.4	-	2.6	6.6	6.7	6.6	3.6	4.1	1.8
	15	2.8	25.1	19.5	-	30.4	15.5	9.6	6.6	9.4	1.9	1.6	6.5	6.1	11.0	8.4	13.0	2.7
	30	2.6	16.7	20.5	18.2	11.3	20.9	15.1	8.5	13.4	3.2	3.4	10.3	4.2	11.3	8.3	12.7	2.6
	60	3.2	6.8	14.4	20.1	12.4	21.4	-	7.6	10.5	3.2	2.6	6.0	11.2	12.8	9.4	9.9	2.6
	90	-	-	8.9	-	17.9	19.8	6.8	9.6	11.6	7.2	6.8	8.5	5.0	11.8	3.8	14.9	9.7
	120	3.7	2.6	3.6	9.4	16.5	18.2	16.7	8.1	10.5	16.6	21.9	9.8	4.9	11.5	12.0	13.5	9.4
	150	3.9	3.6	4.8	4.4	14.2	13.2	15.2	11.2	10.7	12.1	19.3	11.5	5.8	10.7	14.1	12.3	12.1
(C)	15	-	25.9	25.8	30.3	34.7	-	16.6	8.7	18.9	2.3	1.7	14.0	-	11.6	6.4	23.7	2.2
	30	4.4	27.0	19.8	28.3	-	-	-	9.0	10.4	2.8	1.2	12.4	3.5	11.7	8.2	35.8	3.0
	60	5.6	29.6	24.4	16.4	14.6	17.3	13.8	12.9	19.5	5.4	2.1	14.3	8.2	15.1	9.1	27.5	4.1
	90	6.4	28.5	30.1	28.4	18.8	15.1	16.9	14.8	25.2	9.3	4.0	17.0	3.4	12.4	9.5	18.7	6.6
	120	5.3	18.0	19.1	26.6	13.5	-	13.0	8.9	25.4	26.3	12.4	13.6	-	12.7	13.8	12.1	16.4
	150	5.5	13.6	17.9	34.4	14.0	-	15.4	12.7	20.5	23.0	16.3	8.4	10.0	15.3	18.5	16.5	21.3

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 8.—*Magnesium in sugarbeet processing waste water and in water extracted from soil at various*

TABLE 8.—*Magnesium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
								TWIN FALLS											
(A)	[2]0	-	1.5	1.8	1.9	2.2	2.9	0.5	1.1	.8	1.0	-	-	-	6.5	5.1	5.1	4.7	4.6
	15	-	16.0	9.3	-	-	-	-	16.8	11.2	5.4	-	-	-	14.3	-	-	-	9.2
	30	-	16.7	11.1	5.0	4.4	5.1	4.4	-	-	11.2	-	-	-	13.5	14.3	-	-	7.1
	60	8.0	16.6	8.5	7.4	4.2	4.2	-	-	3.0	7.1	-	-	-	15.2	14.0	22.4	-	8.8
	90	4.5	11.7	6.4	5.8	3.7	3.8	1.7	14.5	9.6	5.8	-	-	-	11.2	13.3	15.9	-	9.6
	120	5.4	11.8	13.9	6.0	-	5.3	0.9	16.2	15.1	14.8	-	-	-	10.1	13.6	19.0	-	10.7
	150	6.5	17.4	5.6	5.3	-	4.6	2.0	19.7	19.8	20.8	-	-	-	15.0	10.7	-	-	-
(B)	15	-	8.8	8.3	2.8	-	7.0	-	-	-	-	-	-	-	-	9.8	11.4	12.5	-
	30	-	-	10.6	10.9	-	8.7	-	-	12.4	-	-	-	-	12.3	7.6	8.4	-	5.9
	60	4.2	8.8	11.0	10.9	-	8.0	1.4	-	9.7	9.7	-	-	-	10.2	11.2	12.9	-	8.9
	90	-	12.0	11.6	-	-	5.8	-	-	6.9	6.7	-	-	-	12.5	12.2	11.5	9.2	9.9
	120	-	5.5	12.0	7.8	-	8.6	3.8	-	9.4	9.0	-	-	-	13.1	13.7	11.9	-	6.8
	150	6.3	6.4	12.7	9.4	-	7.1	5.6	-	10.8	11.4	-	-	-	12.3	9.7	9.1	-	6.8
(C)	15	3.0	19.0	12.2	6.4	-	6.8	6.0	-	2.9	2.4	-	-	-	6.0	7.6	-	8.3	5.5
	30	-	6.7	10.0	5.7	-	4.3	1.8	-	3.4	1.6	-	-	-	6.8	8.2	8.0	8.6	6.1
	60	2.4	16.8	11.3	7.4	-	6.0	4.6	-	4.0	3.7	-	-	-	7.0	7.6	8.2	8.5	6.4
	90	3.5	11.7	12.0	8.2	-	5.4	5.9	-	7.4	3.2	-	-	-	10.4	8.4	7.7	-	6.2
	120	5.4	11.4	14.4	5.6	-	9.0	8.5	-	5.2	5.6	-	-	-	9.6	9.6	5.2	9.8	7.8
	150	6.9	13.1	8.4	7.5	-	4.8	2.8	-	7.1	6.5	-	-	-	11.0	10.7	10.7	10.1	9.3
								RUPERT											
(A)	[2]0	5.0	2.9	7.1	4.0	2.2	-	1.8	-	1.6	1.7	2.0	-	3.2	3.5	3.5	3.3	-	-
	15	4.2	8.7	8.0	11.4	-	-	3.1	-	3.4	2.8	1.5	2.0	7.7	13.0	8.5	-	-	-
	30	7.7	11.1	9.9	9.5	11.4	-	2.0	-	5.9	3.8	-	3.7	6.7	11.2	6.8	-	-	-
	60	6.3	9.4	10.9	10.3	9.5	-	3.0	-	4.9	4.9	4.2	4.2	6.7	11.4	8.5	-	-	-
	90	5.5	7.8	10.4	9.9	8.6	-	5.5	-	-	6.2	6.3	6.2	6.8	11.3	8.7	-	-	-
	120	6.2	9.0	7.6	8.4	11.6	-	7.6	-	7.8	6.8	7.1	7.2	8.0	11.6	9.3	-	-	-
	150	6.0	6.3	7.5	8.2	10.4	-	7.4	-	8.2	8.2	7.6	8.2	8.5	12.7	14.1	-	-	-
(B)	15	4.1	8.5	8.9	5.8	-	-	3.4	-	-	4.0	1.8	-	3.3	11.4	7.4	-	-	-
	30	4.3	7.4	11.0	-	-	-	3.6	-	5.3	4.7	4.7	-	5.0	12.1	8.9	-	-	-
	60	5.4	8.7	8.6	8.3	-	-	5.6	-	5.7	5.3	5.6	-	7.9	12.2	8.1	-	-	-
	90	6.2	7.8	9.0	10.4	-	-	5.4	-	6.6	5.5	5.7	-	5.5	11.3	9.0	-	-	-
	120	4.8	6.8	8.6	9.3	-	-	6.4	-	7.6	6.4	7.1	-	5.8	11.9	10.5	-	-	-
	150	5.0	8.2	8.9	8.3	-	-	8.6	-	8.5	8.3	7.6	-	8.0	13.3	12.2	-	-	-

See footnotes at end of table.

TABLE 8.—*Magnesium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
		RUPERT—Continued																	
(C)	15	4.5	6.2	8.9	4.4	-	-	2.4	-	-	2.5	2.6	2.4	2.4	10.7	8.5	-	-	-
	30	3.6	6.6	-	7.0	-	-	5.5	-	3.8	4.1	8.5	4.3	4.5	7.7	8.2	7.3	-	-
	60	5.4	8.2	9.6	11.2	-	-	6.0	-	5.5	5.1	4.6	5.2	6.1	6.0	8.1	-	-	-
	90	5.4	7.6	8.2	7.2	-	-	6.9	-	5.3	4.2	5.1	5.1	5.8	7.4	7.1	5.8	-	-
	120	4.6	4.9	7.4	6.2	-	-	7.0	-	7.5	5.0	5.8	6.6	5.8	12.0	7.6	7.4	-	-
	150	4.6	5.4	6.4	7.0	-	-	2.2	-	11.0	8.8	8.8	8.8	8.6	11.2	11.6	8.5	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milliequivalents per liter*																	
		TWIN FALLS																	
(A)	0	-	1.4	1.4	1.5	-	1.5	-	4.2	4.7	-	-	-	6.8	3.6	-	1.2	-	1.2
	15	-	-	2.8	1.1	-	1.3	-	3.6	3.2	-	-	-	3.8	-	-	-	-	-
	30	-	5.2	-	1.3	-	.8	-	3.7	3.0	-	-	-	3.8	-	-	-	-	-
	60	-	2.4	1.1	4.6	-	7.4	-	-	4.0	-	-	-	-	-	-	-	-	
	90	-	-	-	-	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	150	-	16.0	15.2	14.1	-	13.2	-	5.8	4.1	-	-	-	4.9	-	-	-	-	-
(B)	15	-	11.6	-	-	-	3.4	-	4.2	6.8	-	-	-	3.4	-	-	-	-	.8
	30	-	7.2	6.0	2.4	-	1.4	-	3.8	6.5	-	-	-	3.4	-	-	1.8	-	.5
	60	-	7.2	6.5	2.3	-	1.4	-	4.4	4.8	-	-	-	4.3	-	-	2.0	-	1.4
	90	-	7.0	7.1	6.2	-	4.7	-	5.7	8.8	-	-	-	4.1	-	-	2.4	-	2.0
	120	-	-	-	-	-	-	-	-	-	-	-	-	7.8	-	-	-	-	-
	150	-	10.1	11.4	-	-	1.9	-	-	-	-	-	-	4.1	-	-	-	-	.9
(C)	15	-	2.0	3.2	1.0	-	-	-	5.8	4.6	-	-	-	-	-	-	-	-	-
	30	-	2.1	1.2	1.3	-	-	-	5.6	4.7	-	-	-	-	3.0	-	2.3	-	1.5
	60	-	2.8	1.2	1.8	-	-	-	5.8	4.4	-	-	-	-	3.2	-	3.2	-	2.1
	90	-	2.7	1.4	1.5	-	-	-	5.2	4.9	-	-	-	-	-	-	1.6	-	1.8
	120	-	3.0	1.4	5.0	-	-	-	7.3	6.0	-	-	-	-	4.0	-	4.5	-	3.6
	150	-	5.3	1.7	2.4	-	-	-	6.0	6.1	-	-	-	-	3.6	-	3.4	-	3.1

RUPERT

(A)	0[2]	1.8	1.8	2.0	2.0	-	3.3	3.3	-	4.0	-	-	-	-	1.7	1.8	1.7	1.6	-
	15	3.0	2.7	1.8	2.3	-	3.4	-	-	-	-	-	-	-	4.4	3.2	2.8	2.7	-
	30	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	3.0	3.9	2.9	-
	60	4.1	5.3	4.2	3.4	-	3.2	-	-	-	-	-	-	-	8.2	7.4	5.6	3.5	-
	90	5.4	5.0	4.0	4.0	-	3.8	-	-	-	-	-	-	-	6.3	7.1	6.4	4.6	-
	120	4.8	5.6	4.7	4.4	-	4.0	-	-	-	-	-	-	-	7.7	8.6	6.8	5.5	-
	150	8.1	6.3	6.9	6.3	-	5.8	-	-	-	-	-	-	-	10.5	10.0	9.5	7.4	-
(B)	15	2.8	2.2	1.9	1.7	-	4.0	7.9	-	11.2	-	-	-	-	4.9	3.6	3.4	5.3	-
	30	4.3	4.1	4.6	3.4	-	6.2	8.0	-	9.8	-	-	-	-	5.9	6.4	7.5	7.0	-
	60	4.0	3.6	3.1	2.6	-	3.1	5.3	-	9.2	-	-	-	-	5.8	6.0	4.4	4.0	-
	90	5.0	4.8	5.3	3.9	-	4.4	6.6	-	11.2	-	-	-	-	10.6	8.6	6.3	5.4	-
	120	3.9	4.4	3.8	4.0	-	4.5	8.0	-	12.1	-	-	-	-	10.1	10.8	8.8	7.4	-
	150	7.1	6.3	5.5	4.8	-	4.4	6.1	-	13.7	-	-	-	-	11.0	10.0	8.0	7.2	-
(C)	15	2.5	1.9	-	-	-	-	8.8	-	8.2	-	-	-	-	-	-	3.4	4.9	-
	30	3.2	2.4	-	3.0	-	5.5	8.4	-	10.1	-	-	-	-	6.8	-	7.0	6.5	48.0
	60	5.5	3.6	5.0	4.0	-	7.2	9.4	-	11.8	-	-	-	-	12.0	-	11.1	12.0	27.0
	90	3.3	3.0	4.6	4.6	-	5.0	8.0	-	10.1	-	-	-	-	16.5	-	12.0	12.7	31.0
	120	4.3	3.7	4.6	4.7	-	4.7	7.9	-	9.0	-	-	-	-	8.8	-	10.0	10.1	18.0
	150	5.4	4.4	5.4	5.1	-	5.5	8.8	-	11.8	-	-	-	-	10.2	-	10.0	10.1	15.0

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm	*Milliequivalents per liter*																
NAMPA																		
(B)	0[2]	-	12.3	12.8	15.8	13.5	18.3	8.4	8.5	16.2	-	-	5.4	4.7	13.6	10.0	12.0	1.1
	15	1.6	13.5	15.2	-	17.6	18.9	12.9	8.2	14.2	2.5	-	7.5	7.5	11.2	11.3	20.4	2.6
	30	1.3	12.5	13.3	19.2	10.7	20.1	13.0	9.0	14.4	3.2	-	10.0	7.8	11.8	11.2	17.2	2.6
	60	1.7	5.7	13.1	20.2	19.8	22.6	-	7.7	15.5	4.0	-	5.5	14.2	11.6	13.6	13.0	2.7
	90	-	-	6.9	-	24.5	28.2	11.0	12.2	14.5	9.6	-	9.4	10.7	14.8	14.8	11.6	7.9
	120	2.6	1.9	3.8	8.2	26.9	27.0	25.5	14.8	14.0	33.4	-	11.9	9.1	12.4	13.3	13.2	8.4
	150	2.7	2.8	3.3	4.4	18.9	26.6	25.2	17.9	15.0	26.9	-	17.0	11.5	15.1	19.4	15.2	14.0
(C)	15	-	10.9	11.9	13.2	20.4	-	10.6	6.6	18.3	1.2	-	10.4	-	11.8	6.6	20.9	1.6
	30	1.5	10.5	11.6	13.2	-	-	-	6.8	19.8	1.2	-	11.8	6.9	12.0	7.1	28.0	2.4
	60	2.0	10.6	11.2	13.2	13.1	17.3	14.5	8.0	18.0	1.4	-	10.1	6.9	12.0	7.2	19.8	2.8
	90	2.5	10.8	11.9	13.9	-	15.1	12.1	8.5	13.4	2.0	-	10.0	7.1	11.7	7.0	13.8	5.0
	120	3.2	10.0	14.7	19.0	12.6	-	19.9	10.8	18.8	8.5	-	10.1	-	14.4	10.0	8.9	11.5
	150	2.8	8.0	12.4	17.2	17.2	-	21.3	15.5	14.8	10.5	-	6.8	6.7	15.4	13.8	10.2	12.4

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 9.—*Sodium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975 Oct.	1975 Nov.	1975 Dec.	1976 Jan.	1976 Feb.	1976 Mar.	1976 Apr.	1976 May	1976 June	1976 July	1976 Aug.	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.
	Cm	*Milliequivalents per liter*																	
TWIN FALLS																			
(A)	[2]0	-	12.0	6.1	4.7	5.4	7.3	8.0	0.4	0.4	0.7	-	-	-	6.4	9.2	7.6	7.1	9.3
	15	-	20.0	11.0	-	-	6.8	-	14.0	10.6	16.6	-	-	-	13.0	-	-	-	9.1
	30	-	16.7	11.8	7.0	4.4	8.0	7.4	-	-	15.2	-	-	-	14.7	16.2	-	-	11.9
	60	7.0	18.9	12.1	8.3	4.9	7.9	8.6	-	8.4	8.4	-	-	-	11.9	9.8	15.0	-	10.2
	90	6.7	15.4	12.0	8.0	5.0	8.1	8.9	8.5	7.5	6.4	-	-	-	7.8	9.4	9.1	-	9.3
	120	5.4	15.8	12.2	6.3	-	6.7	9.2	-	7.7	6.3	-	-	-	6.4	9.1	7.6	-	9.2
	150	4.9	13.4	13.1	6.7	-	8.2	7.7	8.2	10.6	8.6	-	-	-	9.0	10.0	-	-	-
(B)	15	5.4	4.8	9.1	8.2	-	5.3	-	-	-	-	-	-	-	-	-	15.0	12.5	-
	30	-	-	7.0	3.2	-	6.7	6.4	-	11.5	-	-	-	-	10.2	12.1	9.9	-	8.4
	60	3.6	3.8	8.1	6.7	-	7.4	6.4	-	9.6	8.1	-	-	-	10.2	15.1	10.6	-	5.0
	90	2.9	5.0	9.0	7.5	-	8.0	-	-	6.6	6.9	-	-	-	6.8	15.9	10.7	11.0	5.3
	120	3.5	3.5	9.8	7.9	-	8.2	6.8	-	5.9	5.8	-	-	-	7.0	10.7	9.3	-	6.1
	150	3.5	3.3	8.9	6.7	-	8.3	8.0	-	6.1	6.2	-	-	-	8.5	9.5	8.2	-	6.6
(C)	15	8.7	15.8	5.4	7.0	-	7.8	7.4	-	8.6	4.3	-	-	-	6.2	8.7	-	8.0	7.2
	30	4.0	4.0	4.8	5.9	-	6.2	6.2	-	6.7	4.4	-	-	-	7.6	9.1	8.2	8.2	7.2
	60	6.6	11.5	6.4	6.7	-	7.6	7.2	-	6.2	5.7	-	-	-	7.0	9.2	7.9	7.8	8.3
	90	5.6	7.6	5.4	6.8	-	8.0	7.0	-	6.1	4.1	-	-	-	6.8	8.8	8.0	7.5	-
	120	6.8	8.5	5.3	5.4	-	7.4	6.6	-	5.2	4.0	-	-	-	6.2	9.1	8.2	7.3	5.8
	150	8.5	10.5	6.0	6.1	-	7.6	7.0	-	4.5	4.8	-	-	-	6.6	9.3	7.2	7.4	6.0
RUPERT																			
(A)	[2]0	1.0	1.6	3.3	2.7	2.4	-	1.6	-	.9	1.1	1.2	-	2.5	2.0	2.6	3.2	-	-
	15	3.9	4.9	5.0	3.2	-	-	2.6	-	4.6	2.7	4.0	3.0	2.9	5.5	-	-	-	-
	30	5.1	6.7	5.0	4.1	4.4	-	2.4	-	4.6	3.5	-	4.5	4.5	6.2	5.8	-	-	-
	60	4.2	5.9	5.9	4.2	4.4	-	3.3	-	3.8	3.7	4.2	4.6	5.7	5.6	4.9	-	-	-
	90	3.3	4.9	5.3	4.4	5.2	-	3.8	-	4.0	4.0	4.1	4.5	4.9	5.4	4.6	-	-	-
	120	3.8	5.2	4.6	4.3	4.9	-	3.8	-	4.4	4.2	3.9	3.3	4.1	5.0	4.6	-	-	-
	150	2.7	4.3	3.3	4.2	4.4	-	3.9	-	4.2	4.5	3.0	2.9	3.8	4.6	5.2	-	-	-
(B)	15	3.6	4.8	4.9	3.2	-	-	2.7	-	-	3.4	1.9	-	2.8	5.0	3.4	-	-	-
	30	5.5	5.5	4.5	4.5	-	-	2.9	-	3.6	3.8	4.3	-	4.9	5.6	4.2	-	-	-
	60	4.8	5.0	4.5	4.1	-	-	3.6	-	3.9	4.0	4.1	-	4.9	5.1	3.6	-	-	-
	90	3.6	4.6	5.0	4.7	-	-	3.8	-	4.1	4.3	3.6	-	4.5	5.2	4.3	-	-	-
	120	2.9	3.9	4.3	4.7	-	-	3.9	-	4.0	4.1	2.7	-	4.6	5.9	4.8	-	-	-
	150	2.5	3.7	4.0	3.4	-	-	3.6	-	3.2	3.5	2.4	-	3.4	5.4	4.7	-	-	-

(C)	15	3.8	5.4	7.2	1.5	-	-	2.8	-	-	3.2	2.9	2.0	4.0	4.7	3.7	-	-	-
	30	5.9	4.3	-	4.9	-	-	3.6	-	3.5	3.8	6.2	3.4	4.7	5.3	3.3	4.4	-	-
	60	5.2	5.9	5.0	4.9	-	-	3.9	-	4.2	4.4	4.2	3.4	4.1	4.6	3.4	-	-	-
	90	3.7	-	5.3	4.1	-	-	4.6	-	4.2	4.2	3.8	4.0	4.4	4.5	3.5	3.8	-	-
	120	2.8	3.2	3.4	3.4	-	-	4.3	-	4.1	4.4	4.0	4.2	4.8	5.4	4.0	5.9	-	-
	150	2.0	1.8	2.2	2.4	-	-	4.0	-	2.8	3.0	2.5	4.2	4.8	5.2	6.0	4.2	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milliequivalents per liter*																	
									TWIN FALLS										
(A)	[2]0	-	.9	.9	.6	-	1.0	-	9.4	10.2	-	-	-	14.6	13.3	-	.9	-	.9
	15	-	-	6.2	2.4	-	2.7	-	5.9	6.0	-	-	-	10.4	-	-	-	-	-
	30	-	10.0	7.7	5.6	-	2.8	-	6.6	5.9	-	-	-	11.3	-	-	9.3	-	-
	60	-	-	2.0	8.2	-	11.4	-	-	7.6	-	-	-	-	-	-	9.3	-	-
	90	-	-	-	-	-	-	-	-	6.2	-	-	-	-	-	-	4.1	-	-
	120	-	-	-	-	-	-	-	-	7.9	-	-	-	-	-	-	10.0	-	-
	150	-	7.2	7.3	7.9	-	7.8	-	8.0	6.7	-	-	-	-	-	-	8.3	-	-
(B)	15	-	11.7	-	9.1	-	6.4	-	8.3	10.0	-	-	-	8.6	-	-	-	-	4.4
	30	-	8.4	9.0	4.7	-	3.4	-	1.2	9.6	-	-	-	10.9	-	-	9.7	-	4.1
	60	-	8.1	8.4	3.9	-	2.6	-	7.6	8.4	-	-	-	13.3	-	-	8.1	-	5.0
	90	-	8.0	8.8	8.4	-	6.3	-	8.5	10.2	-	-	-	10.6	-	-	11.5	-	6.4
	120	-	-	-	-	-	-	-	-	-	-	-	-	11.5	-	-	-	-	24.9
	150	-	-	10.2	4.6	-	3.2	-	-	-	-	-	-	11.4	-	-	-	-	3.5
(C)	15	-	4.0	2.9	1.9	-	-	-	7.8	7.6	-	-	-	-	-	-	-	-	-
	30	-	4.2	3.7	4.1	-	-	-	9.2	7.4	-	-	-	-	9.8	-	-	-	6.7
	60	-	5.0	5.0	4.7	-	-	-	9.6	8.7	-	-	-	-	10.3	-	-	-	8.2
	90	-	4.3	3.1	1.8	-	-	-	8.0	8.2	-	-	-	-	10.2	-	-	-	3.9
	120	-	3.4	2.7	4.0	-	-	-	7.8	8.2	-	-	-	-	9.6	-	-	-	7.1
	150	-	4.3	2.4	2.2	-	-	-	8.2	8.3	-	-	-	-	10.1	-	-	-	5.8
									RUPERT										
(A)	[2]0	-	1.1	1.0	1.2	-	5.8	2.9	-	2.4	-	-	-	-	1.6	1.1	1.3	1.2	-
	15	-	1.6	1.1	1.6	-	4.2	-	-	-	-	-	-	-	2.8	2.4	2.2	2.2	-
	30	-	-	1.8	1.6	-	-	-	-	-	-	-	-	-	-	2.3	3.4	3.5	-
	60	-	2.1	1.9	1.8	-	2.1	-	-	-	-	-	-	-	3.7	3.7	4.4	3.2	-
	90	-	1.9	1.7	1.8	-	2.1	-	-	-	-	-	-	-	3.8	4.3	4.2	4.0	-
	120	-	2.3	2.1	1.9	-	2.1	-	-	-	-	-	-	-	3.5	3.7	3.9	3.4	-
	150	-	2.5	2.6	2.7	-	2.4	-	-	-	-	-	-	-	3.3	3.8	3.5	3.8	-
(B)	15	-	1.3	1.4	1.6	-	5.8	4.6	-	3.5	-	-	-	-	3.0	2.5	3.0	2.9	-
	30	-	2.3	2.3	3.0	-	9.8	6.4	-	3.9	-	-	-	-	3.6	3.7	5.9	5.3	-
	60	-	1.9	1.9	1.8	-	2.3	4.8	-	3.8	-	-	-	-	3.3	3.2	3.4	3.6	-
	90	-	2.4	2.4	2.3	-	2.4	3.2	-	3.9	-	-	-	-	3.7	3.4	2.9	2.8	-
	120	-	2.3	2.0	2.2	-	2.4	3.6	-	4.1	-	-	-	-	3.2	3.9	3.8	3.5	-
	150	-	2.7	2.3	2.4	-	2.3	2.7	-	3.9	-	-	-	-	3.9	4.0	4.2	4.1	-

See footnotes at end of table.

TABLE 9.—*Sodium in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975 Oct.	1975 Nov.	1975 Dec.	1976 Jan.	1976 Feb.	1976 Mar.	1976 Apr.	1976 May	1976 June	1976 July	1976 Aug.	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.
	Cm	*Milliequivalents per liter*																	
								RUPERT—Continued											
(C)	15	-	1.3	-	4.2	-	-	4.5	-	3.1	-	-	-	-	-	-	3.6	5.1	-
	30	-	1.7	-	2.5	-	4.2	4.8	-	3.3	-	-	-	-	3.8	-	5.7	6.0	12.4
	60	-	2.2	2.4	3.0	-	6.2	6.5	-	4.0	-	-	-	-	4.9	-	6.6	6.8	7.5
	90	-	1.8	2.5	2.6	-	3.0	5.8	-	3.8	-	-	-	-	5.9	-	6.3	6.0	6.0
	120	-	2.6	2.3	3.2	-	3.6	6.3	-	5.0	-	-	-	-	4.9	-	6.4	6.2	5.8
	150	-	2.3	2.3	2.8	-	3.1	4.2	-	4.3	-	-	-	-	4.4	-	5.1	5.1	4.7

Location (irrigation schedule[1])	Soil depth	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.	1977 Apr.	1977 May	1977 July	1977 Aug.	1977 Nov.	1977 Dec.	1978 Mar.	1978 Apr.	1978 May	1978 July
	Cm	*Milliequivalents per liter*																
								NAMPA										
(A)	[2]0	-	4.2	6.7	7.4	6.6	8.3	5.0	5.3	6.9	-	3.7	3.2	2.7	8.9	8.8	11.2	1.7
	15	1.1	6.7	6.7	6.8	9.1	8.6	8.4	6.6	8.8	2.8	2.8	4.3	3.2	9.2	10.3	14.1	3.2
	30	1.1	3.7	4.2	6.0	3.6	8.1	7.7	6.5	8.8	3.5	4.2	5.4	4.3	8.5	9.5	12.1	3.8
	60	1.0	1.3	2.2	6.4	6.6	7.9	5.4	6.0	8.3	3.4	3.3	3.4	3.7	9.0	10.4	10.0	3.4
	90	1.4	1.4	1.6	-	4.2	9.5	6.8	6.8	8.2	6.0	6.8	6.4	5.3	6.8	9.8	10.3	8.2
	120	1.2	1.0	1.1	1.5	2.9	5.1	6.0	6.2	7.0	9.2	11.8	7.2	4.9	7.6	10.1	9.4	8.0
	150	1.2	1.0	1.1	1.8	2.2	2.7	3.7	4.9	6.0	7.4	10.1	7.0	6.1	6.2	8.3	8.5	9.7
(C)	15	-	6.1	7.6	9.0	10.1	-	4.8	6.0	10.1	2.4	2.3	5.2	-	9.0	7.5	13.0	2.5
	30	1.0	5.7	7.2	8.6	-	-	-	5.5	10.3	2.8	2.3	5.5	3.8	9.0	7.1	14.6	3.0
	60	1.1	5.6	7.4	9.0	7.6	4.6	6.5	6.0	10.1	4.5	2.9	6.6	4.4	8.2	7.4	11.3	4.7
	90	1.1	4.5	6.6	8.8	-	6.6	5.9	6.1	9.8	5.4	3.3	6.3	4.3	9.2	7.6	10.6	7.3
	120	1.0	2.2	4.1	4.6	7.0	-	3.8	4.6	9.6	9.9	7.1	8.6	-	8.2	7.2	8.0	10.8
	150	1.0	1.5	2.0	3.5	4.0	-	3.0	2.9	4.6	6.4	5.3	4.3	4.4	7.4	7.6	7.7	9.0

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 10.—*Sodium absorption ratio (SAR) in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	No.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm							TWIN FALLS											
(A)	[2]0	-	8.8	2.7	1.8	2.2	2.8	2.4	0.5	0.4	0.7	-	-	-	2.2	2.2	2.0	1.8	3.2
	15	-	3.2	2.8	2.5	-	-	-	3.7	2.3	2.7	-	-	-	2.4	-	-	-	2.6
	30	-	3.1	2.6	1.8	1.2	2.3	3.0	-	-	2.9	-	-	-	2.8	3.6	-	-	2.9
	60	2.9	4.1	2.6	2.1	1.1	2.3	3.2	-	2.8	2.4	-	-	-	2.6	2.2	2.0	-	2.2
	90	3.1	3.8	2.0	2.1	1.2	2.3	3.2	2.8	2.6	2.8	-	-	-	2.4	-	2.2	-	2.2
	120	2.9	4.2	2.7	2.0	-	2.5	3.1	3.0	2.6	2.4	-	-	-	2.7	2.3	2.2	-	2.1
	150	2.5	3.2	2.8	2.0	-	2.4	3.0	2.8	2.3	2.3	-	-	-	3.0	1.9	-	-	-
(B)	15	5.4	1.8	2.6	3.9	-	2.6	2.3	-	-	-	-	-	-	-	4.0	4.2	2.9	-
	30	-	-	2.8	1.2	-	2.7	-	-	3.2	-	-	-	-	2.2	2.6	3.5	-	2.3
	60	-	1.2	1.9	2.2	-	2.8	-	-	2.6	1.9	-	-	-	2.2	2.4	2.6	-	1.4
	90	3.3	1.5	2.0	-	-	2.6	2.9	-	3.3	2.8	-	-	-	2.0	2.7	2.9	4.0	1.5
	120	-	1.9	2.2	2.0	-	2.2	-	-	2.4	2.6	-	-	-	2.0	2.2	2.2	-	1.7
	150	3.6	1.8	2.1	2.0	-	2.1	3.4	-	2.2	2.3	-	-	-	2.3	2.2	2.2	-	1.9
(C)	15	.7	-	1.3	2.1	-	2.1	2.8	-	3.0	2.0	-	-	-	2.0	2.1	-	2.0	2.1
	30	-	1.1	1.4	1.8	-	3.3	1.9	-	2.5	2.5	-	-	-	2.3	2.1	-	2.0	2.0
	60	1.0	2.2	1.5	2.6	-	2.0	2.8	-	2.3	2.2	-	-	-	2.6	2.5	-	1.9	2.2
	90	.9	1.9	1.2	2.5	-	2.0	2.2	-	2.2	1.6	-	-	-	1.6	2.2	-	-	-
	120	1.4	2.1	1.2	1.6	-	2.0	1.8	-	2.3	1.7	-	-	-	1.6	1.9	-	2.0	1.6
	150	2.1	2.4	1.4	2.8	-	2.8	2.4	-	1.9	2.0	-	-	-	1.8	2.0	-	2.4	1.6
								RUPERT											
(A)	[2]0	.4	.9	1.5	.9	.9	-	1.0	-	.9	-	-	-	1.2	1.0	1.3	1.5	-	-
	15	1.4	1.9	2.0	1.1	-	-	1.3	-	2.7	1.3	2.0	1.0	1.3	1.2	1.2	-	-	-
	30	2.2	2.0	1.7	1.4	1.3	-	1.2	-	2.1	1.5	-	1.4	1.4	1.6	1.2	-	-	-
	60	1.6	2.1	2.0	1.4	1.4	-	1.4	-	2.0	1.4	1.8	1.4	1.4	1.2	1.1	-	-	-
	90	1.2	1.9	1.9	1.6	1.7	-	1.3	-	-	1.5	1.5	1.4	1.5	1.5	1.2	-	-	-
	120	1.3	1.8	1.8	1.4	1.3	-	1.2	-	2.0	1.5	1.4	1.4	1.5	1.3	1.4	-	-	-
	150	1.1	2.0	1.5	1.6	1.6	-	1.2	-	1.8	1.6	1.2	1.4	1.8	1.6	1.7	-	-	-
(B)	15	1.1	1.8	2.0	1.5	-	-	1.2	-	-	1.3	1.1	-	1.2	1.2	1.4	-	-	-
	30	2.2	2.4	1.8	-	-	-	1.1	-	1.8	1.4	1.7	-	2.0	1.7	1.4	-	-	-
	60	1.7	1.7	1.7	1.8	-	-	1.2	-	1.9	1.5	1.4	-	3.4	3.4	1.3	-	-	-
	90	1.2	1.8	2.1	1.6	-	-	1.3	-	1.9	1.6	1.4	-	1.6	1.4	1.5	-	-	-
	120	1.0	1.5	1.6	1.5	-	-	1.6	-	2.0	1.5	1.1	-	1.6	1.5	1.5	-	-	-
	150	1.0	1.4	1.8	1.4	-	-	1.2	-	1.5	1.3	.9	-	1.3	1.5	1.4	-	-	-

See footnotes at end of table.

TABLE 10.—*Sodium absorption ratio (SAR) in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	No.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm								RUPERT—Continued										
(C)	15	1.4	2.7	2.9	.6	-	-	1.3	-	-	1.6	1.5	1.5	1.4	2.1	1.0	-	-	-
	30	2.4	1.5	-	1.8	-	-	1.3	-	2.1	1.6	1.9	1.7	1.9	2.4	2.1	1.8	-	-
	60	1.8	2.0	1.8	1.4	-	-	1.3	-	2.2	1.6	1.5	1.6	2.0	1.5	1.2	-	-	-
	90	1.2	-	2.2	1.7	-	-	1.4	-	2.2	1.8	1.4	1.6	1.6	2.0	3.8	1.6	-	-
	120	.9	1.4	1.5	1.2	-	-	1.4	-	2.0	1.4	1.6	1.4	1.5	1.5	1.4	1.9	-	-
	150	.8	.8	1.0	1.0	-	-	1.1	-	1.2	1.0	.8	1.0	1.2	1.2	1.4	1.4	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm								TWIN FALLS										
(A)	[2]0	-	.7	.7	.7	.7	.7	-	2.8	3.0	-	-	-	5.0	8.1	-	.6	-	.7
	15	-	-	2.5	1.5	-	1.6	-	2.5	2.3	-	-	-	4.9	-	-	-	-	-
	30	-	2.8	-	2.9	-	2.0	-	2.8	3.2	-	-	-	5.2	-	-	-	-	-
	60	-	2.0	1.2	3.7	-	4.3	-	-	4.0	-	-	-	-	-	-	-	-	-
	90	-	-	-	2.3	-	-	-	-	3.4	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	150	-	1.9	2.1	-	-	2.5	-	2.3	3.4	-	-	-	-	-	-	-	-	-
(B)	15	-	2.3	-	-	-	2.0	-	2.5	3.0	-	-	-	3.2	-	-	-	-	3.2
	30	-	2.1	2.1	-	1.8	1.6	-	2.3	3.3	-	-	-	4.0	-	-	4.6	-	3.4
	60	-	2.0	2.0	-	1.6	1.4	-	2.4	2.6	-	-	-	4.7	-	-	4.1	-	2.8
	90	-	2.3	2.4	-	2.8	2.4	-	2.6	3.0	-	-	-	-	-	-	5.0	-	3.6
	120	-	-	2.8	-	-	-	-	-	-	-	-	-	4.1	-	-	-	-	2.9
	150	-	-	-	-	-	1.6	-	-	-	-	-	-	-	-	-	-	-	2.6
(C)	15	-	2.0	1.4	-	1.3	-	-	2.2	2.9	-	-	-	-	-	-	-	-	-
	30	-	2.1	2.4	-	2.5	-	-	2.6	3.2	-	-	-	-	4.6	-	4.8	-	3.6
	60	-	2.2	3.0	-	2.5	-	-	2.8	4.8	-	-	-	-	4.3	-	3.9	-	4.0
	90	-	2.1	.9	-	1.0	-	-	2.4	3.5	-	-	-	-	-	-	2.4	-	2.0
	120	-	1.8	1.7	-	1.6	-	-	2.7	3.0	-	-	-	-	5.0	-	4.0	-	2.8
	150	-	2.0	1.2	-	1.0	-	-	2.6	3.1	-	-	-	-	6.1	-	-	-	2.2

RUPERT

(A)	0[2]	.4	.7	.7	.8	-	3.2	1.5	-	1.2	-	-	-	-	-	1.1	.7	.8	.7	-
	15	.8	.7	.6	.9	-	1.7	-	-	-	-	-	-	-	-	1.1	1.1	1.1	1.0	-
	30	-	-	.7	.7	-	-	-	-	-	-	-	-	-	-	-	1.1	1.6	1.5	-
	60	.7	.8	.8	.9	-	1.0	-	-	-	-	-	-	-	-	1.1	1.1	1.4	1.2	-
	90	.9	.7	.8	.8	-	.9	-	-	-	-	-	-	-	-	1.3	1.3	1.4	1.4	-
	120	.9	.9	.8	.9	-	1.0	-	-	-	-	-	-	-	-	1.2	1.1	1.4	1.2	-
	150	1.1	1.1	1.1	1.2	-	1.0	-	-	-	-	-	-	-	-	1.1	1.1	1.1	1.2	-
(B)	15	.8	.7	.6	.9	-	2.4	1.4	-	1.1	-	-	-	-	-	1.3	1.1	1.4	1.2	-
	30	1.2	1.1	1.0	1.4	-	2.7	1.8	-	1.2	-	-	-	-	-	1.3	1.2	1.5	1.6	-
	60	-	.9	1.1	1.0	-	1.2	1.2	-	1.2	-	-	-	-	-	1.1	1.0	1.3	1.4	-
	90	1.0	1.0	1.0	1.0	-	.9	1.0	-	1.2	-	-	-	-	-	1.0	1.0	1.0	1.0	-
	120	1.0	1.1	1.0	1.2	-	1.0	1.0	-	1.2	-	-	-	-	-	1.0	1.0	1.1	1.3	-
	150	1.1	1.0	1.3	1.3	-	1.0	1.0	-	1.3	-	-	-	-	-	1.3	1.1	1.4	1.2	-
(C)	15	.8	.7	-	-	-	-	1.2	-	1.0	-	-	-	-	-	-	-	1.8	2.1	-
	30	1.0	.9	-	1.2	-	1.4	1.3	-	1.2	-	-	-	-	-	1.2	-	1.9	2.3	2.1
	60	1.4	1.0	1.2	1.4	-	2.1	1.7	-	1.2	-	-	-	-	-	1.2	-	1.7	1.8	1.6
	90	.9	.8	1.0	1.2	-	1.2	1.6	-	1.2	-	-	-	-	-	1.3	-	1.5	1.5	1.2
	120	1.3	1.2	1.7	1.5	-	1.4	2.0	-	2.1	-	-	-	-	-	1.6	-	1.9	2.0	1.5
	150	1.1	1.0	1.0	1.4	-	1.2	1.8	-	1.3	-	-	-	-	-	1.3	-	1.7	1.7	1.2

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm							NAMPA										
(B)	0[1]	-	1.6	1.9	1.8	1.7	2.2	2.0	2.4	2.3	-	2.5	1.3	1.2	2.8	3.4	4.1	1.1
	15	.7	1.5	1.6	-	1.8	2.0	2.3	2.4	2.6	1.9	2.2	1.7	1.0	2.7	3.3	3.5	-
	30	.8	1.0	1.2	1.4	1.0	1.8	2.0	2.2	2.3	2.0	2.3	1.7	1.8	2.5	3.0	3.2	2.5
	60	.6	5.5	5.2	1.4	1.5	2.0	-	2.0	2.2	1.9	2.1	1.5	1.0	2.3	3.1	3.0	2.1
	90	-	-	5.9	-	.9	1.9	2.4	2.2	2.2	2.2	2.5	2.2	1.9	1.8	2.7	2.8	2.7
	120	.6	5.3	5.6	.6	.4	1.1	1.3	1.8	1.9	2.0	2.6	2.2	1.8	2.2	2.8	2.6	3.0
	150	.6	5.4	5.6	.6	.6	.6	.8	1.5	1.8	1.9	2.2	2.0	2.0	1.6	2.0	2.3	2.6
(C)	15	-	1.4	1.8	1.9	1.9	-	1.6	2.2	2.4	1.8	1.9	1.5	-	2.7	2.9	2.8	1.9
	30	.6	1.3	1.8	1.9	-	-	-	2.0	2.5	1.8	2.0	1.6	1.7	2.7	2.8	2.6	1.8
	60	.6	1.2	1.8	2.4	2.0	1.2	1.7	1.8	2.2	2.2	2.2	1.9	1.6	2.5	2.6	2.4	2.7
	90	.5	1.0	1.4	2.0	-	1.6	1.6	1.8	2.2	2.0	2.0	1.7	-	2.6	2.7	2.6	3.6
	120	.5	5.5	4.2	1.0	1.9	-	.9	1.2	2.0	2.1	2.2	2.5	1.5	2.1	2.1	2.5	2.9
	150	.4	4.7	5.1	.7	1.0	-	.7	.8	1.1	1.4	1.4	1.6	-	2.0	1.9	2.1	2.2

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 11.—*pH in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm								TWIN FALLS										
(A)	[2]0	-	7.2	7.5	7.5	-	7.6	10.6	6.9	7.9	7.4	-	-	-	7.4	7.1	7.4	7.4	7.3
	15	-	7.4	7.6	-	-	7.6	-	7.3	-	7.4	-	-	-	7.7	-	-	-	7.8
	30	-	7.5	7.6	7.9	-	7.6	7.4	7.6	-	7.4	-	-	-	7.7	7.8	-	-	7.6
	60	7.8	7.4	7.5	7.8	7.8	7.6	7.6	8.0	-	-	-	-	-	7.9	8.0	7.8	-	7.5
	90	7.9	7.7	7.7	7.7	-	7.5	7.8	7.6	7.2	7.6	-	-	-	7.9	8.1	7.4	8.4	7.7
	120	7.8	7.6	7.5	7.7	-	7.8	7.7	7.8	7.6	-	-	-	-	8.0	8.1	8.4	8.2	7.6
	150	7.7	7.7	7.5	8.0	-	7.6	7.5	7.2	7.2	7.6	-	-	-	7.9	7.8	-	-	-
(B)	15	6.9	7.3	7.3	7.7	-	7.9	-	-	7.5	-	-	-	-	-	-	8.2	7.4	-
	30	-	7.4	7.8	8.4	-	7.8	-	-	7.2	-	-	-	-	7.3	7.8	8.0	-	8.0
	60	-	7.6	7.4	-	-	7.5	8.0	-	7.4	7.5	-	-	-	7.6	7.8	7.8	8.2	7.8
	90	6.8	7.4	7.3	-	-	7.5	-	-	7.6	-	-	-	-	8.0	7.8	8.0	7.8	8.0
	120	-	7.7	7.5	7.0	-	7.7	7.9	-	7.8	7.6	-	-	-	8.0	7.7	7.9	-	7.8
	150	7.7	7.8	7.5	8.0	-	7.6	7.8	-	7.8	-	-	-	-	7.6	7.9	8.0	-	8.0
(C)	15	7.9	-	7.5	8.0	-	7.7	8.0	-	7.7	7.5	-	-	-	7.6	7.8	-	7.6	8.1
	30	-	-	7.7	7.9	-	8.0	7.6	-	7.5	7.4	-	-	-	7.8	7.4	7.6	7.5	7.8
	60	7.9	-	7.8	7.8	-	7.5	7.7	-	7.6	7.4	-	-	-	7.8	7.4	7.5	7.6	7.8
	90	7.8	-	7.8	7.8	-	7.4	8.1	-	7.7	7.4	-	-	-	7.8	7.6	7.7	7.9	7.6
	120	7.7	-	7.8	7.8	-	7.6	7.7	-	7.6	7.4	-	-	-	7.8	7.3	7.7	7.6	7.8
	150	7.4	-	7.6	7.8	-	7.7	8.0	-	7.7	7.5	-	-	-	7.7	7.4	8.1	7.6	7.9
									RUPERT										
(A)	[2]0	8.0	7.6	7.9	7.6	7.4	-	7.8	-	7.2	8.2	8.1	-	7.2	7.3	6.6	6.9	-	-
	15	8.1	7.8	7.5	8.2	-	-	7.8	-	7.4	8.0	8.0	7.7	7.5	7.6	7.7	-	-	-
	30	7.4	7.4	7.6	8.1	7.9	-	7.8	-	7.4	8.0	-	7.9	7.5	7.7	8.0	-	-	-
	60	7.7	7.5	7.3	8.3	8.1	-	7.5	-	7.4	7.9	7.9	7.8	7.4	7.5	7.9	-	-	-
	90	7.4	7.5	7.3	8.2	7.6	-	7.7	-	7.5	7.9	7.8	7.6	7.3	7.6	7.6	-	-	-
	120	7.4	7.3	7.3	8.2	7.9	-	7.6	-	7.3	7.7	7.7	7.6	7.5	7.5	7.6	-	-	-
	150	7.8	7.5	7.6	8.3	8.2	-	7.7	-	7.3	7.6	7.7	7.5	7.4	7.5	7.7	-	-	-
(B)	15	7.7	7.1	7.7	8.3	-	-	7.7	-	-	7.6	7.8	-	7.5	7.6	7.9	-	-	-
	30	7.5	7.7	7.3	-	-	-	7.5	-	7.4	8.0	7.8	-	7.4	7.6	7.6	-	-	-
	60	7.5	7.5	7.1	8.2	-	-	8.3	-	6.6	7.8	7.8	-	7.3	7.7	7.7	-	-	-
	90	7.6	7.4	7.2	8.2	-	-	7.5	-	7.1	7.8	7.7	-	7.3	7.7	7.8	-	-	-
	120	7.7	7.6	7.2	8.2	-	-	7.4	-	7.2	7.7	7.8	-	7.4	7.5	8.2	-	-	-
	150	7.7	7.6	7.2	8.4	-	-	7.5	-	7.2	7.7	7.8	-	7.7	7.7	7.5	-	-	-

Location (irrigation schedule[1])	Soil depth	1977 Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1978 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
(C)	15	7.8	8.2	7.0	-	-	-	7.9	-	-	8.0	7.8	7.8	6.9	7.9	-	-	-	-
	30	8.1	7.3	-	8.3	-	-	7.8	-	7.1	8.0	7.7	7.8	7.3	7.7	8.2	8.5	-	-
	60	7.9	7.4	6.9	8.2	-	-	7.8	-	7.3	7.9	7.7	7.7	7.3	7.8	8.2	-	-	-
	90	7.7	7.6	6.9	8.3	-	-	7.6	-	7.4	8.0	7.7	7.7	7.4	7.8	7.6	8.2	-	-
	120	7.7	7.7	7.0	8.3	-	-	7.6	-	7.2	8.0	7.6	7.6	7.2	8.0	7.9	7.9	-	-
	150	8.0	7.9	7.0	8.5	-	-	7.3	-	7.2	7.9	7.6	7.5	7.3	7.9	7.6	8.1	-	-
	Cm																		
TWIN FALLS																			
(A)	[2]0	-	8.6	8.5	8.2	7.9	7.9	-	7.2	7.2	-	-	-	7.4	8.1	-	8.1	-	8.1
	15	-	8.2	8.1	8.3	-	7.7	-	8.0	7.7	-	-	-	-	-	-	-	-	-
	30	-	8.0	-	8.3	-	8.1	-	7.8	7.6	-	-	-	7.9	-	-	7.8	-	7.9
	60	-	8.3	8.3	8.2	-	7.6	-	-	8.0	-	-	-	-	-	-	7.9	-	7.7
	90	-	-	-	-	-	-	-	-	7.9	-	-	-	-	-	-	8.0	-	7.8
	120	-	-	-	-	-	-	-	-	8.2	-	-	-	-	-	-	7.8	-	7.7
	150	-	8.8	7.6	7.8	-	7.5	-	7.9	8.0	-	-	-	-	-	-	7.9	-	7.8
(B)	15	-	8.1	-	-	-	-	-	7.5	7.5		-	-	7.9	-	-	-	-	7.7
	30	-	8.1	7.7	-	8.0	7.7	-	7.5	7.4	-	-	-	7.8	-	-	7.3	-	8.0
	60	-	8.0	7.8	-	8.1	7.7	-	7.4	7.5	-	-	-	7.5	-	-	7.5	-	8.0
	90	-	8.1	7.4	-	7.7	7.7	-	7.6	7.3	-	-	-	7.5	-	-	7.5	-	8.1
	120	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4
	150	-	-	-	-	-	-	-	-	-	-	-	-	8.3	-	-	-	-	8.1
(C)	15	-	8.6	8.3	-	8.2	-	-	7.3	7.6	-	-	-	-	-	-	-	-	-
	30	-	8.5	8.2	-	8.2	-	-	7.3	7.6	-	-	-	-	7.9	-	-	-	-
	60	-	8.5	8.4	-	8.2	-	-	7.3	7.6	-	-	-	-	7.6	-	-	-	-
	90	-	8.5	8.2	-	8.2	-	-	7.2	7.7	-	-	-	-	-	-	-	-	-
	120	-	8.6	8.1	-	7.3	-	-	7.5	7.7	-	-	-	-	7.9	-	-	-	-
	150	-	8.4	8.2	-	7.6	-	-	7.7	7.6	-	-	-	-	8.1	-	-	-	-
RUPERT																			
(A)	[2]0	8.0	8.4	8.3	8.4	-	7.5	8.4	-	7.4	-	-	-	-	8.3	8.2	7.9	6.8	-
	15	8.2	8.5	8.7	8.4	-	8.0	-	-	-	-	-	-	-	8.2	8.2	7.7	8.3	-
	30	-	-	8.5	-	-	-	-	-	-	-	-	-	-	-	8.1	7.8	8.1	-
	60	8.1	8.3	8.2	8.1	-	7.6	-	-	-	-	-	-	-	7.9	8.0	7.5	8.0	-
	90	7.9	8.5	8.2	8.0	-	7.5	-	-	-	-	-	-	-	7.9	7.8	7.4	8.0	-
	120	8.0	8.3	8.1	8.0	-	7.6	-	-	-	-	-	-	-	7.6	7.9	7.3	7.7	-
	150	7.8	8.4	8.4	7.9	-	7.5	-	-	-	-	-	-	-	7.8	7.8	7.3	7.8	-
(B)	15	8.0	8.4	8.6	8.4	-	7.8	6.7	-	7.8	-	-	-	-	8.0	8.4	8.0	8.1	-
	30	8.3	8.5	8.4	8.2	-	7.7	7.5	-	7.7	-	-	-	-	7.4	8.0	7.6	7.6	-
	60	8.0	8.4	8.5	8.0	-	7.9	7.1	-	7.8	-	-	-	-	8.0	8.1	7.5	7.6	-
	90	8.0	8.5	8.1	8.0	-	8.1	7.0	-	7.8	-	-	-	-	8.0	8.1	7.3	7.3	-
	120	8.0	8.5	8.3	8.3	-	7.5	7.7	-	7.8	-	-	-	-	7.9	8.5	7.3	7.4	-
	150	8.1	8.4	8.3	8.3	-	7.7	7.7	-	7.7	-	-	-	-	7.0	7.2	7.4	7.5	-

See footnotes at end of table.

TABLE 11.—*pH in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm									RUPERT—Continued									
(C)	15	8.0	8.5	-	-	-	-	6.7	-	7.2	-	-	-	-	-	-	7.3	7.5	-
	30	8.2	8.6	-	8.3	-	7.6	7.5	-	7.6	-	-	-	-	8.0	-	7.9	7.5	-
	60	7.9	8.6	8.1	8.1	-	7.4	7.3	-	7.7	-	-	-	-	7.9	-	7.4	7.4	7.5
	90	7.9	8.6	7.7	7.9	-	7.4	7.1	-	7.3	-	-	-	-	7.8	-	7.3	6.9	7.6
	120	7.9	8.5	8.0	8.0	-	7.4	7.3	-	7.9	-	-	-	-	7.7	-	7.3	7.5	7.7
	150	7.9	8.4	8.0	8.2	-	7.2	6.7	-	7.4	-	-	-	-	7.7	-	7.3	7.4	7.5

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm								NAMPA									
(B)	[2]0	-	6.8	6.9	7.2	7.3	7.4	7.4	7.2	7.7	-	7.7	7.1	7.4	7.5	7.2	6.9	8.3
	15	6.8	7.9	8.1	-	7.7	7.6	8.2	7.5	8.5	8.6	8.3	7.8	7.7	7.9	7.9	7.6	7.9
	30	6.8	8.3	8.2	7.8	7.8	7.5	7.8	8.0	8.4	8.6	8.2	7.6	7.7	8.0	7.7	7.7	8.0
	60	6.8	8.2	8.2	7.5	7.8	7.4	8.4	7.7	8.5	8.6	8.1	8.0	7.8	8.2	7.6	7.7	8.0
	90	6.8	8.5	8.3	-	8.3	7.8	8.4	8.2	8.5	8.6	7.8	8.0	7.8	7.8	7.9	7.8	7.9
	120	6.8	8.3	8.4	8.3	8.1	7.8	7.7	7.7	8.5	8.2	7.6	7.8	7.7	7.9	7.7	7.5	7.6
	150	6.9	8.4	8.4	8.3	7.8	7.8	7.8	7.7	8.4	8.0	7.3	7.7	7.8	8.0	7.7	7.6	7.5
(C)	15	-	7.5	7.7	7.6	8.1	-	8.2	7.6	8.3	8.4	8.0	7.3	-	7.9	7.9	7.3	8.0
	30	6.9	7.9	7.8	7.1	-	-	-	7.9	8.2	8.6	7.9	7.5	8.4	7.8	7.7	7.4	7.9
	60	6.9	8.2	7.8	7.3	8.4	7.7	-	7.9	8.2	8.3	7.7	7.5	7.8	7.8	7.5	7.5	7.8
	90	6.9	7.9	7.8	7.4	-	8.3	8.1	7.7	8.2	8.4	8.0	7.5	7.8	8.1	8.0	7.9	8.1
	120	6.9	7.9	7.9	7.7	8.2	-	8.1	8.1	8.2	8.3	7.7	7.5	-	7.6	7.7	7.7	7.7
	150	6.9	7.8	8.0	7.8	8.3	-	8.3	8.0	8.4	8.2	7.7	8.1	8.1	7.6	7.7	7.8	7.5

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 12.—*Chlorides in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975 Oct.	1975 Nov.	1975 Dec.	1976 Jan.	1976 Feb.	1976 Mar.	1976 Apr.	1976 May	1976 June	1976 July	1976 Aug.	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.
	Cm	*Milliequivalents per liter*																	
									TWIN FALLS										
(A)	[2]0	-	16.2	10.5	9.5	9.6	5.6	6.9	0.3	0.2	0.2	-	-	-	5.6	7.2	8.2	7.1	10.1
	15	-	13.3	12.1	12.0	-	7.1	9.7	7.4	7.1	9.2	-	-	-	11.6	-	-	-	9.7
	30	-	12.0	11.9	10.8	10.8	7.6	8.9	-	-	9.8	-	-	-	12.5	-	-	-	16.9
	60	5.5	11.5	12.9	10.8	5.1	6.6	-	-	9.4	8.0	-	-	-	9.8	12.2	14.4	-	11.6
	90	1.2	9.5	11.1	10.7	10.6	6.6	11.1	6.1	7.6	8.5	-	-	-	8.2	9.9	10.1	8.2	10.4
	120	2.2	8.9	10.0	10.2	11.6	6.3	-	5.8	8.1	-	-	-	-	7.9	9.4	7.9	9.6	10.4
	150	1.8	8.2	9.4	10.9	10.2	7.1	10.8	5.7	7.5	5.8	-	-	-	8.1	8.8	-	-	-
(B)	15	6.1	6.7	9.4	10.7	-	5.2	-	-	-	-	-	-	-	-	-	15.9	13.7	-
	30	-	-	11.4	19.0	-	10.3	-	-	8.3	-	-	-	-	10.2	12.3	13.0	-	11.0
	60	3.5	4.6	10.7	10.6	-	8.7	11.7	-	8.8	6.5	-	-	-	12.7	12.9	11.3	9.5	10.0
	90	2.2	.6	9.2	9.4	-	7.8	-	-	7.1	6.8	-	-	-	7.1	14.4	15.0	12.7	12.2
	120	-	.9	9.6	10.3	-	8.8	6.3	-	8.1	7.5	-	-	-	9.8	9.1	9.0	-	9.4
	150	.8	.7	8.7	7.9	-	7.1	7.3	-	7.0	5.7	-	-	-	8.6	9.1	9.0	-	8.7
(C)	15	1.9	16.1	-	7.6	-	8.3	7.0	-	10.8	3.2	-	-	-	6.2	7.1	-	8.1	9.8
	30	2.1	5.9	11.2	10.9	-	8.8	6.0	-	8.1	1.9	-	-	-	6.5	6.6	8.6	8.0	10.2
	60	1.6	11.8	11.1	9.4	-	7.9	5.3	-	8.2	4.4	-	-	-	6.3	7.1	8.2	3.9	11.1
	90	3.5	7.7	10.5	10.0	-	7.1	3.8	-	8.8	2.9	-	-	-	6.2	7.1	8.7	7.6	10.1
	120	3.2	7.5	11.1	10.5	-	8.5	9.2	-	7.8	2.7	-	-	-	5.1	6.6	8.4	7.4	10.1
	150	3.1	7.9	7.4	9.0	-	8.8	6.3	-	7.6	3.8	-	-	-	5.5	6.8	-	7.2	10.3
									RUPERT										
(A)	[2]0	8.9	6.8	21.4	12.6	6.3	-	1.8	-	.2	.7	0.8	-	3.6	4.3	6.3	6.1	-	-
	15	3.2	20.8	11.9	8.9	-	-	3.4	-	3.1	1.6	.9	1.2	4.6	7.2	7.2	-	-	-
	30	3.8	12.8	9.2	8.7	11.1	-	2.8	-	3.6	3.0	-	2.0	2.6	7.6	6.6	-	-	-
	60	3.1	8.4	10.0	6.9	9.1	-	4.6	-	4.4	3.0	2.4	2.6	2.5	7.9	6.2	-	-	-
	90	2.7	6.0	8.4	11.0	-	-	5.0	-	-	5.2	6.0	5.6	4.5	6.9	5.9	-	-	-
	120	2.5	7.6	7.6	8.9	11.6	-	5.3	-	5.8	5.4	5.2	5.5	5.1	6.6	6.3	-	-	-
	150	1.5	4.4	4.9	8.4	9.1	-	5.5	-	4.5	5.8	5.5	5.1	5.7	5.7	6.6	-	-	-
(B)	15	2.9	7.4	13.8	6.9	-	-	3.7	-	-	2.6	1.5	-	3.9	7.1	4.8	-	-	-
	30	2.6	4.4	12.2	12.6	-	-	3.4	-	4.7	2.7	7.3	-	4.3	6.1	5.8	-	-	-
	60	3.0	7.6	8.6	10.0	-	-	5.6	-	4.6	3.9	4.3	-	5.2	6.3	4.5	-	-	-
	90	2.6	5.3	7.0	8.5	-	-	5.3	-	5.1	5.1	5.5	-	4.8	5.9	4.8	-	-	-
	120	1.8	4.9	6.6	8.6	-	-	5.5	-	4.8	5.3	4.7	-	5.0	7.0	4.9	-	-	-
	150	1.8	6.1	7.9	7.8	-	-	6.2	-	5.2	5.3	3.6	-	6.2	5.8	4.9	-	-	-

See footnotes at end of table.

TABLE 12.—*Chlorides in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
							RUPERT—Continued												
(C)	15	2.2	6.1	-	7.4	-	-	5.2	-	-	1.7	2.2	2.4	1.8	6.7	-	-	-	-
	30	3.0	8.4	-	11.5	-	-	5.7	-	4.2	2.8	7.6	3.9	4.3	5.5	4.8	4.9	-	-
	60	2.7	6.2	-	12.0	-	-	7.0	-	7.4	5.1	5.5	6.0	6.6	5.2	-	-	-	-
	90	2.6	4.6	-	8.4	-	-	5.6	-	5.3	4.7	4.5	4.8	5.5	5.4	3.6	4.7	-	
	120	2.8	4.9	-	7.3	-	-	5.1	-	5.5	4.5	5.2	5.0	5.1	7.0	3.4	4.4	-	-
	150	2.2	3.3	-	5.0	-	-	4.8	-	4.9	4.8	5.3	4.7	5.2	5.9	4.0	4.2	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milliequivalents per liter*																	
								TWIN FALLS											
(A)	[2]0	-	1.5	1.5	.6	.5	.5	-	7.3	7.7	-	-	-	12.2	9.0	-	.7	.8	-
	15	-	-	4.2	.7	-	.8	-	5.7	4.2	-	-	-	8.4	-	-	-	-	-
	30	-	12.0	-	1.2	2.7	.8	-	5.8	4.9	-	-	-	9.3	8.6	-	-	-	-
	60	-	6.6	1.1	6.7	2.5	17.2	-	-	4.6	-	-	-	-	8.2	-	-	-	-
	90	-	-	-	-	6.2	-	-	-	4.6	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	-	-	-	-
	150	-	9.9	8.7	8.5	-	8.8	-	5.2	5.2	-	-	-	7.2	8.4	-	-	-	-
(B)	15	-	12.3	-	-	.8	6.1	-	7.1	6.6	-	-	-	8.4	-	-	-	-	-
	30	-	10.9	8.6	-	1.0	2.2	-	7.5	10.2	-	-	-	10.0	-	-	5.7	-	-
	60	-	9.2	7.6	-	1.8	1.7	-	6.5	6.5	-	-	-	11.6	-	-	4.7	-	-
	90	-	10.2	7.6	-	.6	5.5	-	7.3	12.6	-	-	-	10.9	-	-	10.3	-	-
	120	-	-	10.2	-	6.4	-	-	-	-	-	-	-	13.5	-	-	-	-	-
	150	-	-	-	-	.7	1.8	-	-	-	-	-	-	11.0	-	-	-	-	-
(C)	15	-	6.0	.6	-	-	-	-	8.2	6.3	-	-	-	-	-	-	-	-	-
	30	-	5.7	.9	-	-	-	-	7.5	6.1	-	-	-	-	-	-	8.5	-	-
	60	-	8.9	.9	-	-	-	-	7.9	6.1	-	-	-	-	-	-	11.0	-	-
	90	-	6.4	.5	-	-	-	-	6.9	5.7	-	-	-	-	-	-	2.4	-	-
	120	-	3.9	3.2	-	-	-	-	8.7	6.2	-	-	-	-	-	-	7.6	-	-
	150	-	6.8	.7	-	-	-	-	7.1	6.3	-	-	-	-	-	-	2.7	-	-

Location (irrigation schedule[1])	Soil depth	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.	1977 Apr.	1977 May	1977 July	1977 Aug.	1977 Nov.	1977 Dec.	1978 Mar.	1978 Apr.	1978 May	1978 July	
	Cm	Milliequivalents per liter																	
RUPERT																			
(A)	[2]0	.8	.7	.6	.7	-	10.7	4.1	5.1	-	-	-	-	-	1.0	1.4	.7	-	-
	15	1.5	1.7	.5	.9	-	11.1	-	-	-	-	-	-	-	7.9	9.9	2.3	-	-
	30	-	-	.7	.8	-	-	-	-	-	-	-	-	-	-	6.4	6.3	-	-
	60	1.7	-	1.7	1.2	-	2.2	-	-	-	-	-	-	-	10.4	10.5	9.5	-	-
	90	2.2	2.6	1.2	1.5	-	1.5	-	-	-	-	-	-	-	12.3	10.2	8.8	-	-
	120	2.0	4.1	2.0	2.1	-	1.6	-	-	-	-	-	-	-	5.8	10.7	7.0	-	-
	150	2.7	4.5	3.7	2.9	-	1.6	-	-	-	-	-	-	-	10.7	14.2	8.7	-	-
(B)	15	3.2	1.1	.6	.9	-	14.2	9.5	14.2	-	-	-	-	-	6.8	4.7	1.6	4.3	-
	30	-	2.2	2.0	2.1	-	9.3	11.1	14.5	-	-	-	-	-	9.7	9.2	13.1	9.8	-
	60	-	3.0	1.7	1.2	-	4.4	10.1	14.2	-	-	-	-	-	9.9	9.1	4.0	4.6	-
	90	4.7	2.8	2.5	1.9	-	2.7	6.8	12.8	-	-	-	-	-	9.2	17.1	4.6	4.3	-
	120	-	3.1	1.5	2.0	-	2.2	6.6	14.3	-	-	-	-	-	10.2	10.1	6.4	7.2	-
	150	4.4	3.8	2.8	2.1	-	2.0	3.9	16.0	-	-	-	-	-	10.9	14.6	8.8	19.9	-
(C)	15	3.0	1.0	-	-	-	-	7.1	9.9	-	-	-	-	-	-	-	3.9	5.2	-
	30	3.5	1.1	-	2.0	-	12.4	7.9	14.2	-	-	-	-	-	11.2	-	9.5	7.8	-
	60	-	2.3	2.6	2.9	-	8.1	10.8	13.4	-	-	-	-	-	12.3	-	14.6	16.0	-
	90	3.7	1.6	1.5	2.8	-	4.1	9.3	11.5	-	-	-	-	-	13.7	-	11.6	12.2	-
	120	5.2	2.4	3.3	3.9	-	4.2	10.8	11.4	-	-	-	-	-	11.9	-	11.1	12.2	-
	150	4.2	3.2	3.5	3.8	-	4.4	9.2	14.1	-	-	-	-	-	13.3	-	11.3	12.1	-
NAMPA																			
(B)	[2]0	-	23.2	27.6	31.9	24.4	31.4	14.3	15.3	28.0	-	.8	8.3	7.8	27.1	23.5	33.5	1.9	
	15	1.7	20.7	28.8	-	27.5	35.0	26.2	19.0	32.8	3.6	1.4	9.0	8.6	26.4	28.7	44.2	4.8	
	30	.7	22.0	26.0	33.1	14.8	30.5	24.1	19.6	30.8	3.3	1.7	11.2	9.2	26.5	27.4	35.8	2.7	
	60	.4	6.6	15.8	32.1	24.7	29.7	13.7	18.4	32.1	4.9	1.1	7.6	9.0	25.7	28.3	34.1	4.0	
	90	-	2.1	10.1	-	25.8	37.4	20.2	17.9	32.9	14.3	10.0	8.3	9.2	24.8	26.5	28.3	10.8	
	120	.5	.4	3.1	13.3	23.1	33.6	31.4	24.4	23.0	40.0	52.9	12.5	8.6	25.0	27.9	28.7	15.3	
	150	.3	.2	.3	3.6	22.8	19.5	34.0	25.9	20.7	27.0	38.3	22.0	10.5	16.9	29.9	26.3	22.5	
(C)	15	-	21.4	27.3	29.5	52.1	-	23.6	18.8	34.6	2.5	.9	12.6	-	29.5	18.4	55.2	3.0	
	30	2.5	22.1	26.9	28.6	-	-	-	18.7	49.9	3.9	.6	12.8	8.8	30.5	19.1	69.8	3.2	
	60	.5	22.3	26.0	27.5	-	25.4	31.1	22.1	49.7	7.4	.7	12.0	7.9	29.1	19.1	56.3	4.0	
	90	.6	21.6	27.2	30.7	-	31.2	24.2	22.8	44.6	12.5	1.3	12.6	7.3	27.3	20.0	51.6	10.7	
	120	.3	15.3	24.4	28.9	-	-	27.6	29.3	46.2	17.5	15.9	10.8	-	24.4	20.9	-	28.4	
	150	.4	10.5	18.7	27.7	-	-	28.5	17.8	26.5	31.1	18.6	5.6	7.5	23.4	25.1	26.5	31.1	

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 13.—*Sulfate in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
								TWIN FALLS											
(A)	0[2]	-	4.0	1.3	1.3	3.0	1.5	2.1	0.9	0.6	0.6	-	-	-	0.7	0.8	0.9	1.0	0.8
	15	-	5.7	3.1	-	-	.7	-	-	5.1	5.3	-	-	-	2.3	-	-	-	1.2
	30	-	4.3	3.4	.5	.5	.7	.5	-	-	5.6	-	-	-	2.6	3.3	-	-	4.2
	60	-	5.2	3.7	.6	.5	.7	.8	.8	3.4	1.9	-	-	-	2.0	2.1	5.1	-	2.6
	90	-	4.5	4.0	.5	.5	.5	.4	.3	.3	.6	-	-	-	1.0	1.0	2.0	1.9	1.8
	120	-	5.6	3.5	.8	.6	.7	-	.4	.1	.1	-	-	-	.3	.6	1.1	1.2	2.0
	150	-	3.8	5.0	.8	.5	1.6	1.0	.4	.2	.2	-	-	-	.2	1.4	-	-	-
(B)	15	-	1.6	5.3	7.6	-	1.5	1.8	-	-	-	-	-	-	-	-	1.7	2.1	-
	30	-	-	5.2	5.4	-	2.4	2.7	-	.6	-	-	-	-	1.4	1.1	1.3	-	1.0
	60	-	1.7	4.4	2.3	-	3.3	.6	-	2.1	2.7	-	-	-	1.7	1.0	1.2	.2	1.0
	90	-	2.1	3.7	1.3	-	1.0	-	-	1.6	2.2	-	-	-	.7	1.2	1.5	1.5	1.0
	120	-	1.4	3.7	1.8	-	1.7	.3	-	1.1	.3	-	-	-	2.4	.7	.4	-	.7
	150	-	.8	3.3	1.5	-	2.0	.3	-	.1	.1	-	-	-	1.2	.8	.5	-	-
(C)	15	-	7.1	2.8	1.0	-	.9	1.4	-	2.4	1.9	-	-	-	1.3	.6	-	1.2	1.0
	30	-	3.3	3.6	1.9	-	.5	1.8	-	2.0	2.0	-	-	-	.9	1.0	.8	.8	1.0
	60	-	3.6	2.2	1.3	-	1.1	1.7	-	1.7	1.5	-	-	-	1.2	1.2	1.0	1.8	1.2
	90	-	2.0	2.1	1.1	-	.3	1.5	-	2.4	1.5	-	-	-	1.2	.7	.4	.4	.5
	120	-	2.8	2.1	1.4	-	.2	1.5	-	1.6	1.1	-	-	-	.9	.5	.4	-	.5
	150	-	3.1	2.0	1.3	-	.3	.7	-	.8	1.6	-	-	-	1.1	.6	.6	-	.5
								RUPERT											
(A)	0[2]	1.1	1.6	2.5	3.6	2.6	-	1.5	-	.2	.9	1.1	-	.7	.5	1.3	.8	-	-
	15	2.7	1.9	2.3	.6	-	-	2.8	-	4.1	1.9	1.8	2.1	1.5	.3	.5	-	-	-
	30	4.0	2.7	2.0	.7	.6	-	2.9	-	5.5	3.0	-	4.5	3.1	.3	.5	-	-	-
	60	4.8	2.0	1.7	.6	.5	-	3.2	-	3.9	3.1	4.5	3.7	2.2	.3	.2	-	-	-
	90	4.2	2.3	2.0	1.3	.6	-	2.4	-	4.4	2.6	3.0	3.0	1.6	.3	.3	-	-	-
	120	4.7	2.8	3.2	.8	.6	-	2.9	-	1.7	2.7	2.7	3.1	1.7	.1	.4	-	-	-
	150	4.9	3.1	3.8	1.4	.4	-	1.9	-	1.0	.7	1.4	1.9	1.8	.2	.2	-	-	-
(B)	15	2.7	2.0	1.6	.7	-	-	2.2	-	-	3.4	1.6	-	1.1	.3	.4	-	-	-
	30	7.3	2.3	1.8	1.0	-	-	1.9	-	2.1	2.4	3.4	-	2.2	.3	.4	-	-	-
	60	6.3	2.4	1.8	.7	-	-	3.2	-	6.4	2.7	4.0	-	2.2	.3	.4	-	-	-
	90	10.5	3.5	3.0	.9	-	-	2.5	-	2.8	2.4	2.3	-	1.5	.3	.3	-	-	-
	120	5.5	3.4	4.1	1.6	-	-	2.2	-	1.8	1.9	1.9	-	1.2	.3	-	-	-	-
	150	4.3	2.7	2.1	.5	-	-	1.1	-	2.1	2.9	3.1	-	1.5	.1	.3	-	-	-

(C)	15	12.7	2.6	3.0	.7	-	-	2.3	-	-	2.2	2.3	2.7	2.1	.3	-	-	-	-
	30	5.8	2.3	1.6	.8	-	-	2.5	-	3.3	3.7	5.1	3.5	4.9	.5	.4	.6	-	-
	60	12.6	3.1	1.7	.8	-	-	2.5	-	4.9	2.7	3.4	3.4	3.2	1.0	-	-	-	-
	90	9.2	3.2	4.7	.9	-	-	3.2	-	4.5	2.8	3.6	3.2	2.3	.7	.6	.1	-	-
	120	4.5	5.3	4.5	4.1	-	-	3.0	-	3.1	3.3	3.7	3.7	3.3	1.4	.4	.6	-	-
	150	2.9	4.8	5.5	3.0	-	-	4.8	-	3.4	4.6	3.8	3.3	2.1	.4	.4	.1	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	Milliequivalents per liter																	
TWIN FALLS																			
(A)	[2]0	-	.5	.4	.7	.6	.6	-	1.7	.8	-	-	-	.5	.9	-	.7	.6	1.1
	15	-	-	2.3	.7	-	1.2	-	1.3	.8	-	-	-	.1	-	-	-	-	-
	30	-	1.9	-	1.1	-	1.2	-	1.1	.5	-	-	-	-	-	-	-	-	-
	60	-	1.4	.6	2.9	-	4.3	-	-	2.7	-	-	-	-	-	-	-	-	-
	90	-	-	-	-	-	-	-	-	.6	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	150	-	.9	.8	1.4	-	2.0	-	1.2	.8	-	-	-	-	-	-	1.9	-	-
(B)	15	-	1.6	-	-	-	2.1	-	2.3	1.6	-	-	-	.8	-	-	-	-	.8
	30	-	1.6	1.7	-	1.2	1.1	-	2.0	1.4	-	-	-	1.1	-	-	1.8	-	.6
	60	-	2.4	2.1	-	1.3	1.3	-	1.8	.8	-	-	-	.8	-	-	1.9	-	1.4
	90	-	1.5	1.7	-	1.2	1.4	-	1.5	1.0	-	-	-	.6	-	-	2.8	-	1.4
	120	-	-	.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.8
	150	-	.2	-	-	-	1.3	-	2.2	-	-	-	-	-	-	-	-	-	.9
(C)	15	-	1.2	.5	-	.7	-	-	2.0	1.0	-	-	-	-	-	-	-	-	-
	30	-	1.1	.7	-	1.2	-	-	2.2	1.0	-	-	-	-	.3	-	2.1	-	1.5
	60	-	1.2	.4	-	.6	-	-	2.5	1.1	-	-	-	-	.4	-	2.6	-	1.4
	90	-	1.4	.3	-	.7	-	-	1.7	.5	-	-	-	-	-	-	1.2	-	1.0
	120	-	1.0	.6	-	1.7	-	-	2.2	.6	-	-	-	-	1.9	-	2.8	-	1.7
	150	-	1.3	.5	-	1.0	-	-	2.0	.3	-	-	-	-	-	-	1.7	-	2.0
RUPERT																			
(A)	[2]0	.6	.4	.5	.5	-	.2	.8	-	1.4	-	-	-	-	.8	.3	1.2	1.1	-
	15	1.1	1.2	.6	1.2	-	.8	-	-	-	-	-	-	-	.5	.4	2.2	1.9	-
	30	-	-	.9	1.1	-	-	-	-	-	-	-	-	-	-	.6	4.2	2.9	-
	60	2.9	2.6	1.4	1.4	-	2.2	-	-	-	-	-	-	-	2.6	2.4	5.4	4.1	-
	90	2.4	1.9	1.3	1.3	-	1.2	-	-	-	-	-	-	-	2.0	2.0	4.2	3.5	-
	120	2.0	2.5	1.8	2.4	-	1.9	-	-	-	-	-	-	-	3.5	2.3	5.0	4.5	-
	150	1.1	2.2	1.8	2.7	-	1.6	-	-	-	-	-	-	-	1.1	.7	3.6	4.0	-
(B)	15	.7	.5	.7	.8	-	.2	1.2	-	1.8	-	-	-	-	.9	.7	2.4	2.2	-
	30	1.5	1.1	1.1	1.9	-	3.8	3.0	-	1.3	-	-	-	-	2.6	1.7	2.0	4.4	-
	60	-	1.4	1.1	1.1	-	1.4	1.2	-	.8	-	-	-	-	3.5	2.8	4.4	4.2	-
	90	1.5	1.0	1.0	1.1	-	1.0	1.3	-	.6	-	-	-	-	3.5	2.8	4.6	4.2	-
	120	.7	1.3	1.1	1.1	-	1.3	1.2	-	.2	-	-	-	-	3.8	4.5	5.0	2.1	-
	150	1.0	1.1	1.2	1.4	-	1.2	1.3	-	.2	-	-	-	-	.3	.1	.4	1.2	-

See footnotes at end of table.

TABLE 13.—*Sulfate in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations—Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
									RUPERT—Continued										
(C)	15	0.7	0.6	-	3.1	-	-	0.7	-	2.3	-	-	-	-	-	-	1.9	3.4	-
	30	.9	.6	-	1.9	-	2.4	.8	-	1.0	-	-	-	-	3.6	-	4.4	6.5	-
	60	1.5	.8	1.2	1.5	-	3.0	2.1	-	.3	-	-	-	-	5.5	-	-	7.3	-
	90	.9	.7	1.1	1.5	-	1.2	1.9	-	.7	-	-	-	-	10.0	-	1.8	7.7	-
	120	1.1	.9	1.3	1.3	-	.9	2.2	-	.1	-	-	-	-	1.8	-	4.7	4.9	-
	150	.7	.2	.7	.9	-	.6	1.4	-	.1	-	-	-	-	.1	-	-	.4	

Location (irrigation schedule[1])	Soil depth	1976				1977									1978			
		Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	July	Aug.	Nov.	Dec.	Mar.	Apr.	May	July
	Cm	*Milliequivalents per liter*																
									NAMPA									
(B)	[2]0	-	.7	.4	.4	.7	.7	.4	.2	.6	-	.6	.4	.4	.5	.8	1.9	2.0
	15	.2	.7	.6	-	.1	.8	2.1	.8	1.3	1.1	.8	.4	.2	.7	.6	.8	.9
	30	.4	.9	.5	.4	.4	.6	1.1	.8	1.4	1.1	1.3	.3	.2	.7	.5	1.2	4.8
	60	.3	.2	.4	.2	.5	.6	.6	.8	1.3	1.2	.9	.5	.2	.7	.6	1.5	1.1
	90	.4	-	.2	-	.5	.6	-	.7	1.0	1.5	3.2	.7	.1	.8	.7	1.1	1.8
	120	.2	.2	.2	-	.3	.8	.7	.9	1.0	1.0	3.1	1.4	.2	.7	.7	1.2	2.3
	150	.5	.3	2.7	4.5	.2	.5	.8	.7	1.2	1.2	3.1	2.2	1.3	.6	.6	1.0	1.6
(C)	15	-	.3	.4	.3	.4	-	.7	.7	1.7	1.0	.7	.2	-	.7	.8	2.7	.8
	30	.1	.6	.5	.2	-	-	-	.5	1.7	.9	.7	.2	.2	.6	.7	3.1	.7
	60	.2	.7	.5	.2	-	.7	.8	.8	1.8	1.6	.8	.3	.1	.6	.7	2.4	1.1
	90	.3	.6	.5	.3	-	.6	.7	.7	1.5	1.7	1.0	.2	.2	.5	.8	2.7	1.6
	120	.1	.4	.5	.5	.4	-	.7	1.6	1.5	1.2	2.0	1.1	-	.5	1.0	2.3	2.0
	150	.1	.2	.4	.5	.4	-	.5	.8	1.3	1.1	1.4	1.8	.8	.4	.8	2.2	2.5

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 14.—*Bicarbonate in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
								TWIN FALLS											
(A)	[2]0	-	48.5	49.5	47.0	49.3	4.5	2.0	1.0	2.3	2.0	-	-	-	13.2	20.6	25.8	46.4	28.3
	15	7.3	21.9	37.7	-	-	-	-	1.4	-	4.8	-	-	-	8.8	-	-	-	27.9
	30	10.9	18.6	37.7	32.1	29.1	4.4	3.7	-	-	2.0	-	-	-	6.1	4.8	-	-	13.7
	60	8.1	16.0	45.4	34.2	33.3	4.3	-	-	-	-	-	-	-	2.0	10.1	7.6	-	25.7
	90	10.6	15.2	43.3	31.9	27.9	3.7	-	4.9	8.8	7.2	-	-	-	6.4	6.9	7.0	-	25.7
	120	11.9	11.5	54.2	34.0	21.8	2.8	-	5.5	.5	-	-	-	-	8.2	8.1	10.2	-	24.1
	150	11.5	28.2	40.1	28.1	24.7	4.1	2.3	5.0	5.9	6.6	-	-	-	8.2	7.9	-	-	-
(B)	15	6.1	-	18.4	14.1	-	4.0	-	-	-	-	-	-	-	10.5	-	23.5	31.1	-
	30	8.4	34.6	11.3	11.6	-	3.5	-	-	.7	-	-	-	-	15.1	7.3	19.3	-	20.6
	60	7.2	13.0	25.1	18.3	-	4.2	-	-	1.6	2.0	-	-	-	4.8	7.3	20.8	-	23.5
	90	10.5	18.6	28.3	19.8	-	-	-	-	2.3	-	-	-	-	-	6.1	12.2	8.9	22.9
	120	12.1	19.8	36.9	26.2	-	4.0	2.7	-	8.0	8.7	-	-	-	5.0	13.0	27.7	-	29.9
	150	12.8	10.9	33.9	26.1	-	4.8	2.3	-	6.8	7.2	-	-	-	7.0	11.4	16.7	-	-
(C)	15	5.9	26.4	35.2	25.9	-	4.1	2.5	-	2.4	3.4	-	-	-	9.4	16.6	-	35.6	11.4
	30	5.0	8.0	26.6	24.6	-	-	2.2	-	3.0	4.0	-	-	-	9.3	16.4	19.6	45.7	24.1
	60	6.6	18.7	29.5	23.3	-	3.7	2.0	-	2.5	3.2	-	-	-	6.2	12.8	18.6	29.2	24.1
	90	9.2	11.6	30.3	25.8	-	4.2	1.9	-	2.1	3.2	-	-	-	11.6	15.9	21.8	-	27.9
	120	11.7	12.2	26.7	28.5	-	3.6	2.7	-	4.1	3.3	-	-	-	10.1	20.3	23.4	36.8	27.6
	150	11.4	15.2	33.9	31.3	-	3.4	1.8	-	4.9	3.3	-	-	-	9.7	19.3	15.8	26.0	27.9
								RUPERT											
(A)	[2]0	27.5	14.1	23.6	19.5	15.9	-	1.9	-	1.4	2.8	3.2	-	2.8	2.0	2.6	6.1	-	-
	15	16.1	10.3	6.6	17.1	-	-	2.2	-	2.2	4.8	5.2	5.0	5.8	9.9	9.7	-	-	-
	30	7.0	19.0	13.7	18.5	21.7	-	2.0	-	2.1	4.3	-	3.6	5.2	11.8	8.0	-	-	-
	60	7.6	13.2	10.9	15.4	19.3	-	2.0	-	2.3	3.1	3.7	3.7	5.5	9.8	8.4	-	-	-
	90	7.6	9.0	10.7	13.7	17.7	-	1.3	-	-	3.5	3.7	3.0	5.7	7.5	9.3	-	-	-
	120	7.7	12.4	7.2	16.9	25.2	-	1.8	-	3.6	3.9	5.9	4.6	5.8	9.7	8.5	-	-	-
	150	8.5	8.4	8.4	16.4	24.4	-	1.9	-	3.7	5.9	5.7	7.8	6.9	8.3	12.7	-	-	-
(B)	15	6.9	15.6	5.8	7.5	-	-	1.8	-	-	4.6	-	-	5.1	12.6	8.8	-	-	-
	30	5.8	18.5	6.1	9.3	-	-	1.7	-	1.5	3.2	6.2	-	5.7	10.0	8.2	-	-	-
	60	10.8	15.8	12.2	15.2	-	-	1.9	-	2.6	4.2	5.5	-	5.3	10.6	7.3	-	-	-
	90	8.4	11.1	11.0	16.8	-	-	1.9	-	2.9	3.9	4.6	-	5.8	10.4	8.9	-	-	-
	120	7.2	8.2	8.7	17.9	-	-	2.1	-	3.5	4.3	5.8	-	5.8	13.5	11.5	-	-	-
	150	8.7	9.2	9.4	14.3	-	-	2.8	-	3.4	4.5	4.7	-	5.1	10.1	12.7	-	-	-

See footnotes at end of table.

TABLE 14.—*Bicarbonate in sugarbeet processing waste water and in water extracted from soil at various depths. Means of 2 sites and various irrigations*—*Continued*

[Dashes indicate no data]

Location (irrigation schedule[1])	Soil depth	1975			1976												1977		
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	Cm	*Milliequivalents per liter*																	
		RUPERT—Continued																	
(C)	15	7.0	4.9	8.0	4.5	-	-	1.9	-	-	8.0	5.6	4.9	7.6	8.5	-	-	-	-
	30	4.4	6.6	6.6	15.9	-	-	2.8	-	1.5	3.0	-	4.0	4.1	6.7	5.4	8.3	-	-
	60	7.1	7.9	12.3	14.3	-	-	1.4	-	2.3	3.7	3.2	4.9	5.1	6.1	-	-	-	-
	90	7.5	4.9	14.2	10.8	-	-	2.2	-	2.2	4.1	4.2	7.1	5.3	6.2	8.4	10.0	-	-
	120	8.6	4.4	11.0	10.7	-	-	1.9	-	2.3	3.6	3.6	7.3	6.7	4.9	6.8	15.2	-	-
	150	8.1	3.0	6.7	6.5	-	-	2.1	-	2.5	4.3	4.4	5.9	7.2	5.5	9.2	10.6	-	-

Location (irrigation schedule[1])	Soil depth	1977									1978								
		Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
	Cm	*Milliequivalents per liter*																	
		TWIN FALLS																	
(A)	[2]0	-	3.1	3.4	3.6	3.5	3.9	-	20.5	22.2	-	-	-	18.7	13.1	-	3.3	2.9	3.1
	15	-	-	6.9	9.4	-	6.9	-	10.3	14.4	-	-	-	10.9	-	-	-	-	-
	30	-	5.7	-	13.0	-	6.6	-	10.5	9.5	-	-	-	15.0	-	-	-	-	-
	60	-	4.9	7.0	10.1	-	8.8	-	-	9.7	-	-	-	-	-	-	7.5	-	-
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	12.9	-	-	-	-	-	-	-	-	-
	150	-	17.9	16.7	18.8	-	17.3	-	14.8	8.3	-	-	-	9.4	-	-	5.3	-	-
(B)	15	-	5.2	-	-	-	5.5	-	14.7	18.9	-	-	-	17.5	-	-	-	-	6.2
	30	-	6.1	7.2	-	6.4	5.9	-	8.9	13.4	-	-	-	18.0	-	-	9.8	-	6.1
	60	-	3.2	2.4	-	5.5	5.8	-	16.5	19.7	-	-	-	19.4	-	-	8.5	-	6.0
	90	-	8.7	9.7	-	8.9	8.9	-	14.1	14.3	-	-	-	19.5	-	-	6.5	-	7.3
	120	-	-	21.3	-	-	-	-	-	-	-	-	-	10.1	-	-	-	-	9.4
	150	-	-	-	-	-	7.7	-	-	-	-	-	-	-	-	-	-	-	5.4
(C)	15	-	4.8	8.7	-	5.7	-	-	17.0	17.4	-	-	-	-	-	-	-	-	-
	30	-	5.5	9.5	-	7.9	-	-	18.7	10.3	-	-	-	-	10.0	-	5.6	-	8.5
	60	-	5.5	7.2	-	9.5	-	-	18.7	11.5	-	-	-	-	13.5	-	10.5	-	9.2
	90	-	5.2	6.9	-	7.0	-	-	19.4	14.9	-	-	-	-	-	-	-	-	8.5
	120	-	6.1	-	-	9.5	-	-	9.8	17.3	-	-	-	-	-	-	6.0	-	11.4
	150	-	5.5	4.9	-	9.8	-	-	14.7	16.4	-	-	-	-	-	-	-	-	10.2

Location (irrigation schedule[1])	Soil depth	1976 Sept.	1976 Oct.	1976 Nov.	1976 Dec.	1977 Jan.	1977 Feb.	1977 Mar.	1977 Apr.	1977 May	1977 July	1977 Aug.	1977 Nov.	1977 Dec.	1978 Mar.	1978 Apr.	1978 May	1978 July	
	Cm	Milliequivalents per liter																	
RUPERT																			
(A)	0[2]	4.2	4.3	4.6	4.8	-	4.8	2.6	-	5.3	-	-	-	-	4.2	4.8	4.1	4.3	-
	15	7.1	6.2	4.5	5.0	-	5.4	-	-	-	-	-	-	-	6.2	5.2	5.4	-	-
	30	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-	4.7	5.2	-	-
	60	6.9	-	2.8	3.5	-	3.2	-	-	-	-	-	-	-	3.3	6.2	5.2	-	-
	90	8.2	5.2	4.5	3.9	-	5.0	-	-	-	-	-	-	-	5.3	4.4	4.6	-	-
	120	6.7	4.2	3.6	4.9	-	4.4	-	-	-	-	-	-	-	4.0	5.7	6.5	-	-
	150	11.0	6.6	4.2	4.0	-	6.1	-	-	-	-	-	-	-	5.4	5.6	5.3	-	-
(B)	15	7.2	4.8	5.6	5.9	-	6.1	12.7	-	12.2	-	-	-	-	4.7	6.2	4.5	9.1	-
	30	-	6.4	4.6	4.1	-	3.0	11.6	-	6.3	-	-	-	-	3.2	4.8	4.4	6.5	-
	60	-	3.1	2.8	3.8	-	2.7	10.6	-	9.8	-	-	-	-	2.3	3.8	5.5	7.2	-
	90	8.4	6.3	4.0	4.0	-	7.0	9.7	-	13.3	-	-	-	-	3.0	3.9	5.9	7.9	-
	120	-	5.6	4.7	4.3	-	6.5	10.5	-	12.2	-	-	-	-	4.8	7.6	7.2	8.8	-
	150	11.9	8.0	5.7	3.5	-	5.0	11.2	-	7.6	-	-	-	-	4.3	7.2	6.2	9.1	-
(C)	15	7.3	4.9	-	-	-	-	21.3	-	10.7	-	-	-	-	-	-	5.3	6.5	-
	30	7.5	6.3	-	5.8	-	5.9	18.0	-	7.9	-	-	-	-	3.9	-	4.7	6.2	1.6
	60	-	6.1	4.9	4.8	-	7.0	13.0	-	9.6	-	-	-	-	3.0	-	4.1	7.1	8.6
	90	8.2	6.8	7.9	4.5	-	6.8	13.9	-	12.5	-	-	-	-	4.0	-	5.8	7.0	7.6
	120	9.5	6.5	5.2	5.4	-	9.3	10.8	-	11.2	-	-	-	-	8.7	-	9.0	10.5	14.6
	150	9.1	6.5	6.4	4.8	-	10.2	10.9	-	13.3	-	-	-	-	8.6	-	7.7	7.2	12.4
NAMPA																			
(B)	0[2]	-	1.7	7.6	8.9	13.2	13.9	9.9	5.8	6.0	-	5.0	11.7	11.2	11.0	6.7	5.6	2.7	
	15	1.9	3.6	5.3	-	20.3	12.4	10.8	5.5	7.6	5.2	5.9	11.3	11.7	10.6	9.7	10.0	6.5	
	30	2.1	2.4	5.7	7.2	5.7	19.3	11.6	7.0	6.8	6.0	7.4	12.1	11.9	10.9	10.8	8.0	6.2	
	60	-	2.6	5.5	-	11.5	22.2	11.4	8.0	7.0	5.7	7.2	7.8	6.3	11.3	9.4	9.3	6.8	
	90	-	2.6	5.7	-	12.7	23.5	6.4	5.3	7.5	5.7	7.0	12.6	13.4	15.7	10.5	6.7	7.2	
	120	2.8	2.5	3.1	5.0	12.4	23.7	15.2	8.3	6.7	4.3	7.9	11.5	14.0	10.8	12.0	8.2	6.8	
	150	3.3	2.6	3.6	6.2	11.2	13.3	15.2	9.4	7.6	4.3	8.7	7.7	12.1	15.6	11.4	8.5	5.3	
(C)	15	-	5.0	9.7	11.3	15.9	-	11.4	6.3	6.9	4.3	4.4	17.3	-	9.0	7.2	6.9	3.1	
	30	1.9	5.0	7.1	9.3	-	-	-	7.1	6.7	4.6	4.3	17.4	10.5	11.6	8.3	11.3	5.7	
	60	2.2	4.9	9.4	11.4	11.1	7.6	-	6.6	6.7	5.5	5.4	16.8	16.1	12.0	8.6	6.8	6.0	
	90	2.1	4.6	9.7	10.9	-	12.1	12.7	6.5	6.5	6.0	6.9	17.3	11.6	9.8	8.7	3.3	7.0	
	120	2.9	4.4	5.8	10.7	16.4	-	3.8	-	7.2	3.7	7.7	15.3	-	10.1	9.1	-	6.4	
	150	2.6	3.7	6.3	10.7	11.2	-	-	4.1	5.1	5.6	8.2	10.4	13.3	13.1	10.5	3.7	6.5	

[1] See text p. 2 for irrigation frequency.
[2] Waste water, depth equals 0 cm.

TABLE 15.—*Organic matter (OM), total Kjeldahl nitrogen (TKN), potassium (K), electrical conductivity (EC), calcium (Ca), magnesium (Mg), sodium (Na), pH and sulfate (SO_4) in sugarbeet processing waste water irrigation fields at beginning and after waste water irrigation and at several soil depths*

[Dashes indicate no data]

Treatment fields	Soil depth	OM		TKN		K		Ca		Mg		Na		SO_4		SAR		pH		EC	
		1975	1978	1975	1978	1975	1978	1975	1978	1975	1978	1975	1978	1975	1978	1975	1978	1975	1978	1975	1978
	Cm	*Percent*				*Milliequivalents per liter*														*Mmhos/cm²*	
								Amalgamated Sugar Co., Twin Falls, Idaho													
A	0-15	1.32	1.85	0.09	0.12	0.88	2.11	4.4	2.6	3.0	0.5	2.6	4.1	-	1.2	1.4	3.2	8.2	6.9	1030	940
	15-30	1.20	1.80	.06	.12	.85	1.41	4.8	1.4	2.2	.2	2.4	3.6	.30	1.0	1.4	4.0	8.2	6.9	960	580
	30-60	1.20	.95	.10	.08	.60	2.11	3.4	4.4	2.5	.8	1.8	7.3	.46	4.6	1.0	4.5	8.4	7.0	700	1385
	60-90	.62	.82	.05	.06	.08	1.82	2.2	3.2	2.0	.6	3.1	5.9	-	3.9	2.1	4.2	8.6	7.0	680	1165
	90-120	.35	.36	.02	.03	.08	3.01	1.7	5.1	1.6	1.1	3.0	5.6	-	4.5	2.4	3.1	8.6	7.4	590	1480
	120-150	.37	.28	.02	.03	.10	2.44	3.5	5.0	1.5	1.3	3.2	3.9	-	3.8	2.9	2.1	8.6	7.4	635	1330
B	0-15	1.08	1.74	.07	.12	.41	1.53	3.6	2.9	1.6	1.0	2.7	1.9	-	1.8	1.7	1.3	8.4	6.8	965	720
	15-30	1.77	.99	.13	.08	1.16	.81	5.6	2.4	2.5	.6	2.2	2.7	.24	2.2	1.1	2.2	8.1	7.1	1210	590
	30-60	1.46	.80	.11	.07	1.10	.74	4.5	2.4	2.0	.8	1.5	4.2	.33	3.4	.8	3.3	8.0	7.2	935	740
	60-90	.49	.61	.04	.05	.62	.63	2.5	2.5	2.0	.8	1.2	4.3	.46	3.3	.8	3.3	8.2	7.3	570	782
	90-120	.41	.65	.03	.05	.18	.60	2.1	2.3	1.5	.8	1.8	4.0	-	2.2	1.4	3.2	8.4	7.2	550	720
	120-150	.33	.34	.03	.03	.08	.28	1.8	3.6	1.5	1.8	1.8	3.8	.03	3.2	1.4	2.3	8.6	7.3	510	940
C	0-15	1.55	2.14	.19	.14	.92	1.00	3.5	3.2	1.8	.8	1.7	1.2	.38	.9	1.1	.8	8.5	6.9	775	530
	15-30	1.47	1.36	.15	.10	.76	.77	5.2	2.1	1.7	.5	1.2	3.0	.28	.9	.6	2.7	8.4	6.7	1010	635
	30-60	.73	.83	.08	.06	.42	.54	3.1	2.4	2.2	.9	1.1	4.3	-	3.2	.7	3.3	8.5	7.0	645	770
	60-90	.45	.35	.06	.03	.18	.27	2.3	2.6	1.6	1.1	1.5	3.6	.40	2.7	1.1	2.6	8.4	7.2	550	750
	90-120	.39	.30	04	.03	.08	.08	2.0	2.5	1.3	1.3	1.7	3.7	.38	2.3	1.3	2.6	8.6	7.2	205	724
	120-150	.34	.21	04	.02	.10	.08	2.2	1.8	.7	1.1	2.3	3.4	.32	2.3	1.8	2.8	8.5	7.2	650	620
								Amalgamated Sugar Co., Rupert, Idaho													
A	0-15	.92	1.16	.10	.08	.38	1.17	3.9	2.6	2.0	1.4	2.3	1.1	.44	1.0	1.4	0.7	8.0	7.3	800	595
	15-30	.80	.79	.09	.06	.32	1.31	3.6	3.3	1.7	1.6	2.8	1.6	-	2.1	1.6	1.0	8.0	7.2	910	750
	30-60	.57	.76	.08	.05	.15	.36	3.6	4.5	2.0	1.8	3.8	2.0	-	3.1	2.2	1.1	8.3	7.0	940	845
	60-90	.61	.54	.07	.03	.15	.23	4.4	4.2	2.6	1.9	2.9	2.0	-	2.8	1.5	1.1	8.4	7.2	1035	830
	90-120	.46	.47	.06	.04	.12	.13	3.8	6.4	2.3	3.4	2.0	3.2	-	-	1.2	1.4	8.4	7.4	880	1320
	120-150	.33	.24	.06	.01	.18	.11	3.7	6.1	3.0	3.4	1.8	3.0	.70	3.0	1.0	1.3	8.4	6.9	880	1355
B	0-15	.91	1.29	.07	.09	.52	1.65	3.9	4.0	1.9	2.2	1.6	.8	.28	1.0	1.0	.4	8.4	6.9	800	795
	15-30	.75	.85	.06	.06	.42	1.75	3.4	3.8	1.7	1.7	1.8	1.6	.32	1.5	1.2	.9	8.4	7.4	755	780
	30-60	.77	.68	.06	.05	.22	.52	2.9	6.6	1.6	2.3	3.0	2.6	-	3.9	1.9	1.2	8.4	7.4	765	1055
	60-90	.51	.40	.03	.03	.10	.17	3.4	7.7	1.9	3.3	2.6	2.7	1.00	4.2	1.6	1.1	8.5	7.4	790	1320
	90-120	.48	.44	.04	.04	.15	.16	3.4	8.2	2.3	3.5	1.8	2.9	-	4.5	1.0	1.1	8.5	6.8	775	1470
	120-150	.36	.43	.04	.03	.25	.15	3.2	7.6	2.6	3.5	1.2	3.0	-	4.5	.7	1.2	8.5	7.2	765	1415

Treat-ment fields	Soil depth	OM		TKN		K		Ca		Mg		Na		SO_4		SAR		pH		EC		
C	0-15	.96	[illegible]	.10	.07	.64	1.52	4.5	3.5	2.2	2.3	1.9	1.4	.48	1.2	1.0	.8	.84	7.2	955	809	
	15-30	.99	.98	.10	.06	.50	1.87	5.2	3.6	2.6	2.1	2.7	1.6	.61	1.0	1.4	.9	8.4	7.2	1160	815	
	30-60	.81	.73	.10	.06	.22	.78	3.4	4.2	1.7	1.1	4.3	1.6	.30	1.5	2.7	.9	8.4	7.5	955	720	
	60-90	.43	.58	.04	.04	.18	.18	4.1	5.4	2.3	2.1	3.1	2.3	.94	3.7	1.7	1.1	8.5	7.4	1010	960	
	90-120	.41	.62	.04	.04	.16	.17	4.8	6.0	2.9	2.6	2.0	2.3	.88	3.7	1.0	1.1	8.5	7.4	1030	1055	
	120-150	.37	.25	.03	.02	.20	.40	4.0	8.6	2.6	5.4	1.6	2.9	-	4.7	.8	1.0	8.5	7.4	870	1690	
		1976	1978	1976	1978	1976	1978	1976	1978	1976	1978	1976	1978	1976	1978	1976	1978	1976	1978	1976	6/78	10/78
	Cm	*Percent*				*Milliequivalents per liter*														*Mmhos/cm²*		
								Amalgamated Sugar Co., Nampa, Idaho														
B	0-15	1.26	.94	.08	.08	.32	2.72	5.0	1.6	2.6	1.1	1.6	2.7	.10	.4	.8	2.3	8.2	7.9	1140	3750	750
	15-30	.62	.79	.04	.06	.11	2.29	5.6	1.4	2.1	1.1	1.6	1.8	.10	.2	.8	1.6	8.2	8.0	965	3330	610
	30-60	.38	.28	.02	.03	.03	1.26	4.2	1.1	1.6	.7	1.8	3.0	.10	.3	.6	3.1	8.2	8.0	770	2170	545
	60-90	.35	.15	.02	.03	.09	.05	4.5	2.1	2.3	1.0	1.6	3.1	.20	.9	.8	2.5	8.2	7.4	855	2115	570
	90-120	.34	.10	.02	.02	.05	.03	3.7	2.2	2.5	1.2	1.0	3.1	.06	1.8	.6	2.4	8.2	7.6	800	1965	660
	120-150	.56	.10	.02	.02	.01	.05	3.6	4.6	2.5	3.2	1.4	4.6	.30	2.5	.8	2.4	8.3	7.0	785	2005	1330
C	0-15	.40	1.40	.02	.10	.01	3.67	2.2	7.0	1.3	3.6	1.5	3.8	.23	.8	1.1	1.6	8.3	7.9	435	3700	1525
	15-30	.45	.60	.03	.05	.01	1.24	1.9	3.4	1.3	1.6	1.2	3.6	.20	1.0	.9	2.3	8.0	8.0	420	5600	905
	30-60	.34	.19	.01	.03	.01	.09	1.6	1.8	1.1	.8	1.2	2.5	.30	.8	1.0	2.1	8.0	7.7	360	2060	505
	60-90	.56	.35	.03	.03	.01	.04	2.3	2.5	1.4	1.0	1.4	3.2	.35	1.3	1.0	2.4	8.2	7.7	460	1500	645
	90-120	.44	.30	.02	.03	.01	.05	2.2	3.1	2.6	1.3	1.6	3.4	.78	2.1	1.0	2.2	8.2	7.6	625	1290	680
	120-150	.34	.52	.02	.04	.01	.04	2.2	3.7	2.7	1.4	1.6	3.5	.78	1.9	1.0	2.1	8.3	7.5	635	1495	830

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