SUSITNA HYDROELECTRIC PROJECT

TASK 7 — ENVIRONMENTAL

SUBTASK 7.04
WATER RESOURCES ANALYSIS
REVIEW OF EXISTING WATER RIGHTS
IN THE SUSITNA RIVER BASIN

DECEMBER 1981

Prepared by:

ACRES

ALASKA POWER AUTHORITY

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REVIEW OF EXISTING WATER RIGHTS IN THE SUSITNA BASIN

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Prepared for

Acres American Incorporated
Buffalo, New York

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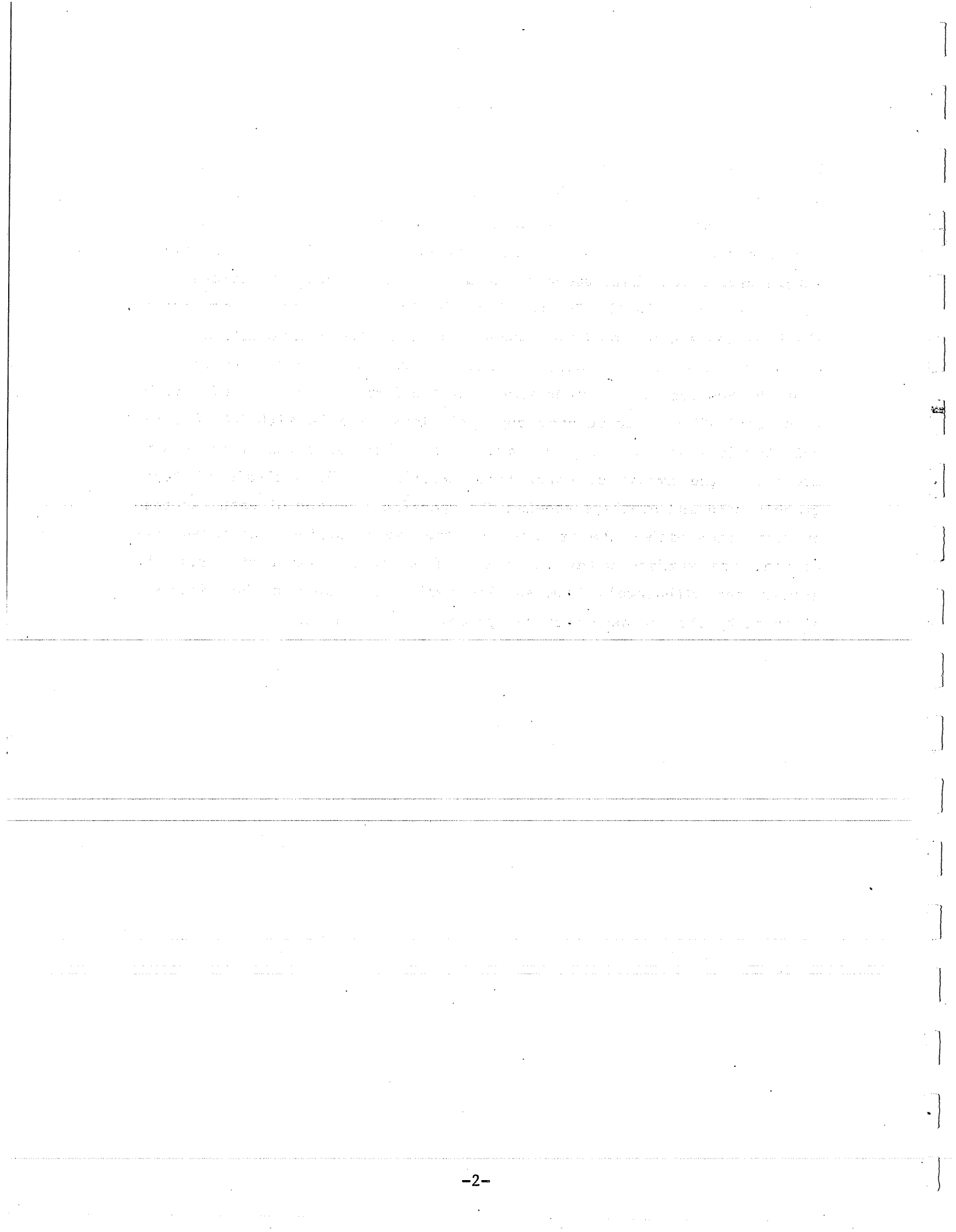
SUMMARY AND CONCLUSIONS

Water rights for 18 different areas in the Susitna River basin were examined, and the amount of surface water or groundwater appropriated for each type of use was tabulated. A summary table was prepared to indicate the total amount of surface water and groundwater appropriated within each area. This summary indicated that the only significant uses of surface water in the Susitna River basin occur in the headwaters of the Kahiltna and Willow Creek township grids. Its principal use is for mining operations on a seasonal basis. No surface water withdrawals from the Susitna River are on file with the Alaska Department of Natural Resources (DNR). Groundwater appropriations on file with DNR for the mainstem Susitna River corridor are minimal, both in terms of numbers of users and the amount of water being withdrawn. An analysis of topographic maps and overlays showing the specific location of each recorded appropriation within the mainstem Susitna River corridor indicated that neither the surface water diversions from small tributaries nor the groundwater withdrawals from shallow wells are likely to be adversely affected by the proposed Susitna hydroelectric project.



INTRODUCTION

The application for license for the proposed Susitna hydroelectric project must include a statement regarding the effects of the proposed project on existing water rights. The applicant must apply to the State of Alaska for a water right to appropriate, divert, and use water for generating power. A copy of the water rights application must also be included in the application for license, which will be submitted to the Federal Energy Regulatory Commission (FERC).

In a survey conducted during January 1981 (Dwight and Trihey 1981), agencies and special interest groups asked the following questions:

1. what permitted or licensed water use rights presently exist in the Susitna River basin;

2. would operation of the dam allow present day out-of-stream diversions to be maintained; and

3. would postproject flows result in a change of water table conditions that would adversely affect domestic wells or surface water supplies.

This report provides an interpretive summary of existing water rights in the Susitna River basin to enable Acres American Inc. (Acres) to prepare the required information for the application for license and to assist in identifying any adverse effects that the proposed project might have on existing water rights claims.

WATER RIGHTS DATA

Water rights are administered by the Alaska Department of Natural Resources (DNR). The legal documents protecting water rights are certificates, permits, and applications. Certificates are issued for water rights that have been perfected, i.e., the water is being beneficially used. Permits are issued for water rights that are waiting final approval following the construction of structures necessary to use the water. When DNR accepts an application to develop water rights, the priority date of appropriation is established. However, approval pends on the development and perfection of the water right as well as adjudication of the quantity requested to protect prior appropriations.

DNR's Water Management Section has computerized certain data from the water rights case files on all certificates, permits, and applications pending. Computer files are updated monthly. The computer files contain the following information:

1. water rights identification number and standard industrial code classification number for each type of water use associated with that water right;

2. the quantity of water appropriated and diverted, expressed as cubic feet per second (cfs), gallons per day (gpd), acre-feet per year (ac-ft/yr), or full flow;

3. the source (stream or river, spring, well) and well depth;

4. the priority date and number of days during the year that the water is used;

5. the lattitude/longitude coordinates for the point of diversion and point of use, and the quarter section of the township where this occurs;

6. the legal status (certificate, permit, or pending) of the water right; and

7. the appropriator's name.

Case files for certificates, permits, and applications pending are stored in the district offices of DNR's Division of Land and Water Management.

SEARCH STRATEGY AND DATA INTERPRETATION

In response to a request from Acres, DNR's Water Management Section staff searched the computer files and generated a printout reflecting all data that had been coded as of September 10, 1981. To facilitate the search, they selected township grids for 17 different segments of the river basin. They sent the computer printout and township list to Acres on September 24 (Brown 1981).

As the first step to interpreting the data, the 17 township grids were mapped at scale 1:250,000 and transferred to a 1:1,000,000 map (Figure 1). The map was reviewed with DNR Water Management Section staff. Corrections and additions were made, and the Susitna reservoir township grid was included. No other townships were considered necessary for the search at this time (G. Doggett, pers. comm.; P. Janke, pers. comm.; G. Prokosch, pers. comm.).

To interpret the types of water appropriations identified on the computer printout, the listing that DNR has developed from the standard industrial code was obtained (S. Mack, pers. comm.). Six of the township grids contained no data: Kashwitna, Sheep Creek, Talkeetna, Tokositna, Happy, and Alexander Creek. Summary tables were developed for the remaining township grids. Each table displays information on certificates, permits, and applications pending. For each type of water use, as described by the standard industrial code classification, the amount of surface water or groundwater appropriated is expressed in cfs, gpd, or ac-ft/yr. The number of days in the year that the water use is "active" is noted. The total amount of surface water and groundwater that has been appropriated in each township grid is tabulated in either cfs, gpd, or ac-ft/yr (see Table 1). Cubic feet per second and gallons per day express the total amount of water as a flow rate; ac-ft/yr expresses that same amount of water as an annual storage volume.

In order to compare total water use by township grid, the three flow rates were converted to a single equivalent flow rate, expressed in both

cfs and ac-ft/yr (Table 2). The results were summarized to compare total surface and groundwater use by township grids in equivalent flow rates (Table 3).

Finally, a 1:250,000 scale overlay was produced with DNR's geoprocessor, which identified the specific location of each recorded water right along the mainstem Susitna River corridor. This overlay was placed on the corresponding U.S. Geological Survey (USGS) topographic maps for the purpose of identifying potential areas of concern (Figures 2 and 3). Five areas were identified where appropriations existed within the vicinity (less than one mile) of the mainstem Susitna River. Two areas were examined further on a 1:63,360 overlay and USGS topographic map (Figure 4).

DISCUSSION

Based on a comparison of equivalent cfs and ac-ft/yr (Table 3), the only significant uses of surface water in the Susitna River basin occur in the headwaters of the Kahiltna and Willow Creek township grids. Its principal use is for mining operations on a seasonal basis. Water appropriations are 125 cfs or 37,000 ac-ft/yr in the Kahiltna area and 18.3 cfs or 5,660 ac-ft/yr in the Willow Creek area. Along the mainstem Susitna River, only .153 cfs or 50 ac-ft/yr of surface water has been appropriated for all purposes. Water appropriations in other areas are even less significant. The following assessment of project effects on existing water rights is focused specifically on the mainstem river corridor. Data on existing water rights for the remaining township grids in the Susitna River basin are summarized in the Appendix.

The Susitna township grid, which encompasses 30 townships, extends from the proposed impoundment area at Devil Canyon downstream to the estuary. As shown in Table 1, both surface (4,900 gpd) and groundwater (7,600 gpd) appropriations are primarily for single family and multi-family homes. A small amount of water is used year-round for watering livestock. The greatest usage occurs during summer months for irrigating lawns, gardens, and crops. The largest single use of surface water is for placer gold operations.

As shown on Figures 2 and 3 and listed on Table 4, there are only five areas where water appropriations are located within one mile of the mainstem Susitna River. There are no surface water diversions recorded that draw water directly from the Susitna River or its adjoining side channels and sloughs.

Immediately downstream from the Delta Islands, on the west bank of the Susitna River, a single family dwelling has a certificate for 650 gpd of groundwater from a well of unlisted depth. The certificate includes .5 ac-ft/yr for crop irrigation for three months. About six miles below Talkeetna, and 0.25 miles inland from the west bank of the Susitna River, a single family dwelling has a certificate for 500 gpd of ground-

water from a 90-foot deep well. Postproject water surface elevations for the mainstem river below Talkeetna are expected to be approximately three feet higher during winter months and from one half to one and a half feet lower during the summer months (R&M Consultants, Inc. In press). Such a moderate range of fluctuation is not expected to adversely affect the groundwater zones being tapped by two small capacity domestic wells in the Delta Islands and Trapper Creek areas.

In the vicinity of Sherman, at mile 258 of the Alaska Railroad, Sherman Creek and an unnamed stream have been appropriated for two single family dwellings (325 gpd) and lawn and garden irrigation (50 gpd). The surface water appropriations at Sherman are 50 to 100 feet above the present elevation of the Susitna River and would not be influenced by changes in water surface elevation of the Susitna River.

In Talkeetna, groundwater from three shallow (20, 27, and 34 ft) wells have been appropriated for a single family dwelling (500 gpd), the grade school (910 gpd), and the fire station (500 gpd). In the vicinity of Chase, between mile 235 and 236 of the Alaska Railroad, several unnamed streams, lakes, and creeks have been appropriated for single family dwellings (1,250 gpd), lawn and garden irrigation (100 gpd), and crops (1 ac-ft/yr). The appropriations in the vicinity of Talkeetna and Chase were examined on a 1:63,360 overlay and USGS topographic map (Figure 4).

The three shallow wells (20-34 ft depth) recorded in Talkeetna are approximately 1.5 miles downstream from the confluence of the Chulitna and Susitna Rivers and 0.13 miles downstream from the confluence of the Talkeetna River. From all visual indications, the Talkeetna River appears to be up gradient and is the principal recharge source for these wells. It appears that the water surface elevation of the Susitna River could be influencing the groundwater level by providing the down gradient base elevation for the water table. However, the anticipated maximum decrease in average monthly water surface elevation of the Susitna River near Talkeetna is forecast to be from one to one and a

half feet (R&M Consultants, Inc. In press). At worst, this might reduce the water surface elevations of the local water table one to one and a half feet.

In the vicinity of Chase, all surface water appropriations are from small tributary streams and lakes at an elevation of 450 to 500 ft mean sea level (msl). The Susitna River is approximately 0.25 miles from the nearest appropriation and is at an elevation of approximately 400 ft msl. The anticipated change in water surface elevation for the mainstem Susitna River near Chase is unlikely to have any affect on surface water diversions from small streams or lakes located 50 to 100 ft above the river on the hillsides.

Table 1. Susitna Township Grid

TYPE	SURFACE WATER APPROPRIATIONS cfs	gpd	ac-ft/yr	DAYS OF USE	GROUNDWATER APPROPRIATIONS cfs	gpd	ac-ft/yr	DAYS OF USE
Certificates								
Single family dwelling		4,500		365		5,440		365
		75		214				
2-4 unit housing						1,200		365
grade schools						910		334
Fire protection						500		365
Animals		63.5		365		94		365
Lawn and garden irrigation		200		184				
		100		153			.5	60
General crops			12.5	153			5.5	91
Total		4,938.5	12.5			8,144	6.0	
Permits								
Single family dwelling		250		365				
Vegetables			1	153				
Total		250	1					
Pending								
Single family dwelling		75		365		1,000		365
						250		214
Lawn and garden irrigation		50		183				
Placer gold	.1			184				
Total	.1	125				1,250		
Total	.1	5,313.5	13.5			9,394	6.0	

Table 2. Conversion of Surface Water and Groundwater Appropriations to Equivalent Flow Rates

	TOWNSHIP GRID	SURFACE WATER EQUIVALENT				GROUNDWATER EQUIVALENT			
		cfs	gpd	ac-ft/yr	Total	cfs	gpd	ac-ft/yr	Total
Equivalent cfs	Susitna	.1	.00824	.0446	.153		.015	.0348	.0498
	Fish Creek		.000116		.000116		.003		.00300
	Willow Creek	18.3	.0226		18.3		.153	.000330	.153
	Little Willow Creek		.000581	.00555	.00613		.00190		.00190
	Montana Creek		.00518	.0144	.0196		.0400	.326	.366
	Chulina		.000439	.00278	.00322		.000831		.000831
	Susitna Reservoir		.00465		.00465				
	Chulitna						.00329		.00329
	Kroto-Trapper Creek		.000930	.0555	.0564				
	Kahiltna	124	1.02		125				
	Yentna		.00155		.00155				
	Skwentna		.000556	.00495	.00551		.000775		.000775
Equivalent ac-ft/yr	Susitna	36.4	5.72	13.5	50.0		10.3	6.00	16.3
	Fish Creek		.021		.0210		2.24		2.24
	Willow Creek	5,650	7.10		5,650		128	.100	128
	Little Willow Creek		.420	1.00	1.42		1.37		1.37
	Montana Creek		3.65	4.20	7.85		28.1	236	264
	Chulina		.297	.500	.797		.601		.601
	Susitna Reservoir		3.36		3.36				
	Chulitna						2.38		2.38
	Kroto-Trapper Creek		.672	10.0	10.7				
	Kahiltna	36,700	302		37,000				
	Yentna		.565		.565				
	Skwentna		.402	1.50	1.90		.560		.560

Conversion factor (to three significant figures)

1 gpd = .00000155 cfs X gpd x .00000155 cfs = Y cfs
1 cfs = 1.98 ac-ft/day X cfs x 198 ac-ft/day x # days = Y ac-ft/yr

Table 3. Summary of Surface Water and Groundwater Appropriations in Equivalent Flow Rates

TOWNSHIP GRID	SURFACE WATER EQUIVALENT		GROUNDWATER EQUIVALENT	
	cfs	ac-ft/yr	cfs	ac-ft/yr
Susitna	.153	50.0	.0498	16.3
Fish Creek	.000116	.02100	.00300	2.24
Willow Creek	18.3	5,660	.153	128
Little Willow Creek	.00613	1.42	.00190	1.37
Montana Creek	.0196	7.85	.366	264
Chulina	.00322	.797	.000831	.601
Susitna Reservoir	.00465	3.36		
Chulitna			.00329	2.38
Kroto-Trapper Creek	.0564	10.7		
Kahiltna	125	37,000		
Yentna	.00155	.565		
Skwentna	.00551	1.90	.000775	.560

Table 4. Water Appropriations Adjacent to the Susitna River

LOCATION[1]	ADL NO.	TYPE	SOURCE (DEPTH)	AMOUNT	DAYS OF USE
		Certificate			
T19N R5W	45156	single family dwelling	well (?)	650 gpd	365
		general crops	same source	.5 ac-ft/yr	91
		Certificate			
T25N R5W	43981	single family dwelling	well (90 ft)	500 gpd	365
		Certificate			
T26N R5W	78895	single family dwelling	well (20 ft)	500 gpd	365
	200540	grade school	well (27 ft)	910 gpd	334
	209233	fire station	well (34 ft)	500 gpd	365
		Certificate			
T27N R5W	200180	single family dwelling	unnamed stream	200 gpd	365
		lawn and garden irrigation	same source	100 gpd	153
	200515	single family dwelling	unnamed stream	500 gpd	365
	206633	single family dwelling	unnamed lake	75 gpd	365
	206930	single family dwelling	unnamed lake	250 gpd	365
	206931	single family dwelling	unnamed lake	250 gpd	365
		Permit			
	206929	general crops	unnamed creek	1 ac-ft/yr	153
		Permit			
T30N R3W	206735	single family dwelling	unnamed stream	250 gpd	365
		Pending			
	209866	single family dwelling	Sherman Creek	75 gpd	365
		lawn and garden irrigation	same source	50 gpd	183

[1] All locations are within the Seward Meridian

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APPENDIX

Appendix

Fish Creek Township Grid (2 townships)

A single family dwelling has water rights for 75 gpd of surface water during three summer months, and a trailer park site, 2,000 gpd of groundwater year-round (Table 5).

Willow Creek Township Grid (5 townships)

On a year-round basis, groundwater is the major source of water for single family dwellings, the library, a campground, and animals, lawns, gardens, and crops (Table 6). Groundwater supplies are used year-round at the Independence Mine (83,120 gpd). The major use of surface water occurs on a seasonal basis for mining operations.

Little Willow Creek Township Grid (2 townships)

A small amount of surface water and groundwater is utilized for single family dwellings and for watering animals, lawns, and gardens (Table 7).

Montana Creek Township Grid (4 townships)

Groundwater is the major source for single family dwellings, schools, and for watering animals and crops (Table 8).

Chulina Township Grid (1 township)

A small amount of both surface water and groundwater is used for single family dwellings and for watering animals, lawns, and gardens (Table 9).

Susitna Reservoir Township Grid (46 townships)

The only appropriation recorded in the area encompassed by the proposed reservoir is the permit held by the Alaska Power Authority for the forty man camp from which field work is conducted in support of the feasibility studies. The permit is for 3,000 gpd of lake water (Table 10).

Chulitna Township Grid (13 townships)

A limited amount of groundwater is appropriated for year-round use, 120 gpd for single family dwellings and 2,000 gpd for trailer park camps (Table 11).

Kroto-Trapper Creek Township Grid (2 townships)

Single family dwellings only have water rights for 600 gpd of surface water. The major use is for crop irrigation (Table 12).

Kahiltna Township Grid (9 townships)

Surface water is used exclusively on a seasonal basis for various mining operations (Table 13).

Yentna Township Grid (16 townships)

Surface water is used exclusively on a seasonal basis for placer gold operations (Table 14).

Skwentna Township Grid (18 townships)

Both surface and groundwater supply small quantities for single family dwellings (Table 15). Surface water is also used for watering animals and crops.

Table 5. Fish Creek Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificates								
Single family dwelling		75		92				
Trailer park camp sites						2,000		365
Total		75				2,000		

Table 6. Willow Creek Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificates								
Single family dwelling		415		365		9,520		365
		75		120		75		245
2-4 unit housing		75		122				
Libraries & info centers						300		365
Animals						445		365
Lawn and garden irrigation							.1	153
General crops						4,000		91
Gold and silver mining	8	5,000		153				
Land & water conservation						1,000		153
Total	8	5,565				15,340	.1	
Permits								
Gold mining	8	5,000		153				
Placer gold	.6			153				
Total	8.6	5,000						
Pending								
Gold mining		4,000		153				
Load gold						83,120		365
Placer gold	1.7			184				
	1.7	4,000				83,120		
Total	18.3	14,565				98,460	.1	

Table 7. Little Willow Creek Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificates								
Single family dwelling		375		365		800		365
Animals						425		365
Lawn and garden irrigation			1	91				
Total		375	1			1,225		

Table 8. Montana Creek Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificates								
Single family dwelling		1,000		365		6,675		365
2-4 unit housing		1,225		365				
Grade schools						4,800		242
Animals		200		214				
Lawn and garden irrigation			1.0	123				
			2.0	153				
			.5	184				
Total		2,425	3.5			11,475		
Permits								
Single family dwelling		500		365		500		365
Animals		160		365				
Total		660				500		
Pending								
Single family dwelling		250		365				
Animals		10		365		14,700		365
Lawn and garden irrigation			.5	153				
General crops			.2	153			236	365
Total		260	.7			14,700	236	
Total		3,345	4.2			26,675	236	

Table 9. Chulina Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificates								
Single family dwelling		75		365				
Lawn and garden irrigation		30		153				
Total		105						
Permits								
Single family dwelling		80		365		500		365
Animals		98		365		36		365
Lawn and garden irrigation			.5	91				
Total		178	.5			536		
Total		283	.5			536		

Table 10. Susitna Reservoir Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Permits								
Work camps		3,000		365				
Total		3,000						

Table 11. Chulitna Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificates								
Single family dwelling						120		365
Trailer park camp sites						2,000		365
Total						2,120		

Table 12. Kroto-Trapper Creek Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Permits								
Single family dwelling		600		365				
General crops			10	91				
Total		600	10					

Table 13. Kahiltna Township Grid

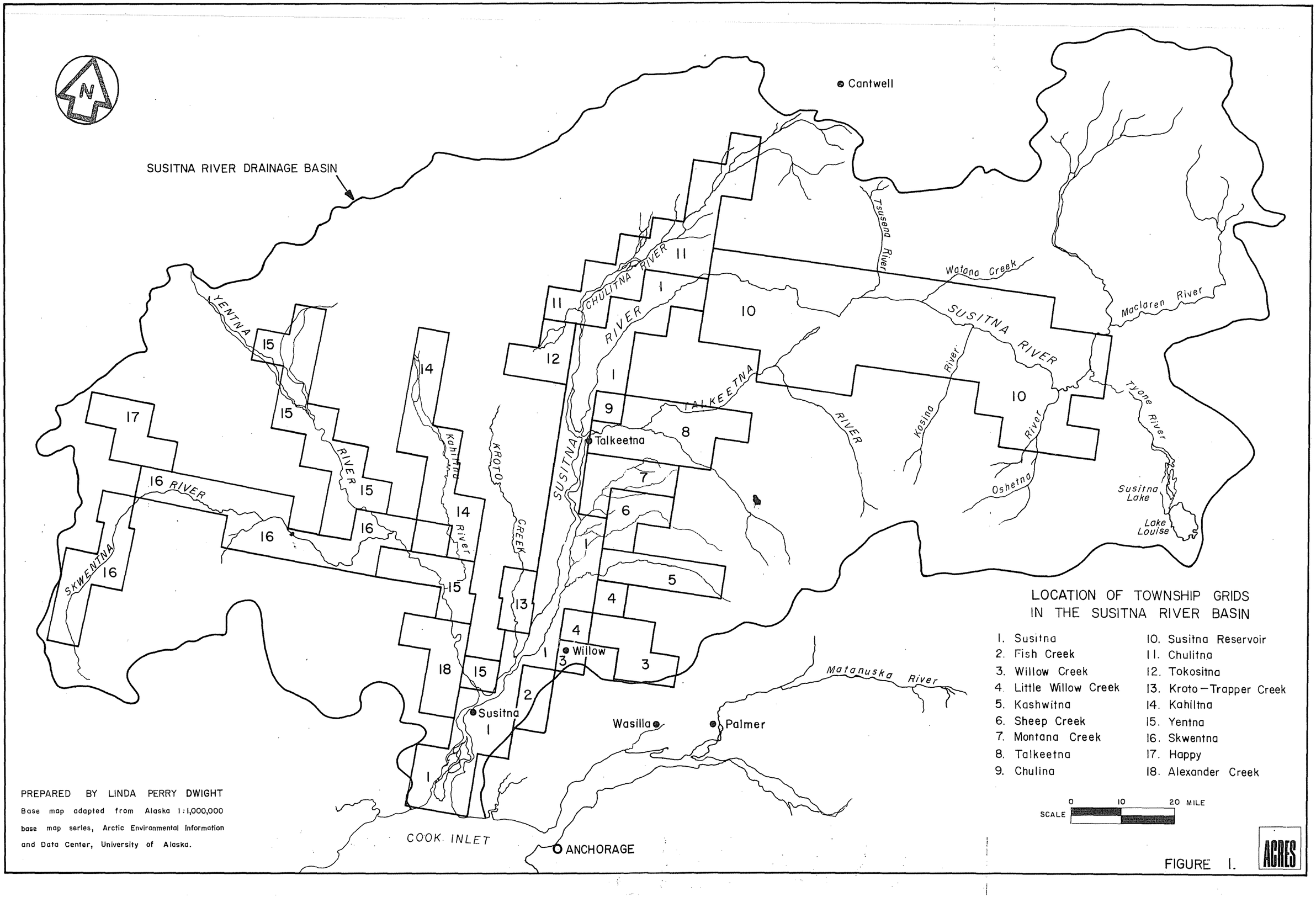
TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Permits								
Gold mining	45.3	200,000		153				
Placer gold	24			153				
Total	69.3	200,000						
Pending								
Gold and silver mining	2	5,000		153				
Gold mining	45	452,500		153				
Placer gold	8			92				
Total	55	457,500						
Total	124.3	657,500						

Table 14. Yentna Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Pending								
Placer gold		1,000		184				
Total		1,000						

Table 15. Skwentna Township Grid

TYPE	SURFACE WATER APPROPRIATIONS			DAYS	GROUNDWATER APPROPRIATIONS			DAYS
	cfs	gpd	ac-ft/yr	OF USE	cfs	gpd	ac-ft/yr	OF USE
Certificate								
Single family dwelling		250		365				
Total		250						
Permit								
Single family dwelling						500		365
Animals		109		365				
Lawn and garden irrigation			1.5	153				
Total		109	1.5			500		
Total		359	1.5			500		



LOCATION OF TOWNSHIP GRIDS
IN THE SUSITNA RIVER BASIN

1. Susitna
2. Fish Creek
3. Willow Creek
4. Little Willow Creek
5. Kashwitna
6. Sheep Creek
7. Montana Creek
8. Talkeetna
9. Chulina
10. Susitna Reservoir
11. Chulitna
12. Tokositna
13. Kroto–Trapper Creek
14. Kahiltna
15. Yentna
16. Skwentna
17. Happy
18. Alexander Creek

SCALE 0 10 20 MILE

PREPARED BY LINDA PERRY DWIGHT

Base map adapted from Alaska 1:1,000,000 base map series, Arctic Environmental Information and Data Center, University of Alaska.

FIGURE 1.

ACRES

▲=004656 Water Rights Case File Number
Alaska Dept. of Natural Resources

206735 206866

202944

Figure (4)

200440 209436

206656

Talkeetna 78895 209233 200546

206378

80358

48981 46352

43977 202144

46351

46844 209167 206936

64409 209328

209231

40769 43969

40722 59599

40613

46349

WATER RIGHTS IN THE MAINSTEM SUSITNA RIVER CORRIDOR
TALKEETNA AND TALKEETNA MOUNTAIN QUADRANGLES

PREPARED BY LINDA PERRY DWIGHT
Reference: Base map from U.S. Geological Survey
Data from Alaska Dept. of Natural Resources

0 5 10 MILES

FIGURE 2.

ACRES

▲=209234 Water Rights Case File Number
Alaska Dept. of Natural Resources

WATER RIGHTS IN THE MAINSTEM SUSITNA RIVER CORRIDOR
TYONEK AND ANCHORAGE QUADRANGLES

PREPARED BY LINDA PERRY DWIGHT
Reference : Base from U.S. Geological Survey
Data from Alaska Dept. of Natural Resources

0 5 10 MILES

FIGURE 3.

ACRES

▲=200189 Water Rights Case File Number
Alaska Dept. of Natural Resources

206929
200515
206638
206931
206930
200180
200440
206656
206878
80353
78895
209233
200540
43981
46352

N

WATER RIGHTS IN THE MAINSTEM SUSITNA RIVER CORRIDOR
TALKEETNA (B-1) QUADRANGLE

PREPARED BY LINDA PERRY DWIGHT
Reference : Base from U.S. Geological Survey
Data from Alaska Dept. of Natural Resources

0 5 10 MILES

FIGURE 4.

ACRES