State of Alaska
Department of Natural Resources
Division of Mining, Land and Water

South Fork of Campbell Creek Instream Flow Reservation LAS 13222
Findings of Fact, Conclusions of Law and Decision

Application by the Alaska Department of Fish and Game for a Reservation of Water Under AS 46.15, the Alaska Water Use Act

Introduction

On March 19, 1991 the Alaska Department of Natural Resources (DNR) accepted an application from the Alaska Department of Fish and Game (ADF&G) under AS 46.15.145 and 11 AAC 93.141, to reserve a specified portion of the stream flows within South Fork Campbell Creek near Anchorage, Alaska, for the purpose of maintaining specified instream flow rates to protect fish and wildlife habitat, migration and propagation .

Under AS 46.15.145(a)(1), the "protection of fish and wildlife habitat, migration and propagation" is one of four purposes for which the Commissioner of Natural Resources may "reserve sufficient water to maintain a specified instream flow...in a specified part of a stream, throughout a year or for specified times...."

Under 11 AAC 93.141(1),

> protection of fish and wildlife habitat, migration and propagation...means the quantity or level of water necessary to maintain suitable habitat conditions for the various life stages of fish, other aquatic organisms, and wildlife, including waterfowl and mammals, and their habitat, including water quality, depth, velocity and temperature, substrate, or streamside vegetation [.]

Holders of water rights junior to an established instream flow reservation may be unable to divert or withdraw significant amounts of water for consumptive use when stream flows fall below those required by the reservation. Senior water right holders remain essentially unaffected by a junior reservation.

The reservation application adequately described and quantified the requested reservation. Public notice of the adjudication of this application was given consistent with the requirements of 11 AAC 93.145, 11 AAC 93.080 and AS 46.15.133.

Below, the requested reservation is summarized and specific findings of fact and conclusions of law made.

Description of the Proposed Reservation

The Department of Natural Resources proposes to establish an instream flow reservation for the Department of Fish and Game for South Fork Campbell Creek and its floodplain, from the mouth of South Fork Campbell Creek to approximately River Mile 5 for the following time periods and flow rates:

South Fork Campbell Creek	
Time Period	**Flow Rates in Cubic Feet Per Second (CFS)**
January	8
February	7
March	6
April	6
May 1 -15	11
May 16-31	29
June	68
July	54
August	43
September	38
October	31
November	20
December	8

The South Fork Campbell Creek reach is located within Township 12 North, Range 2 West, Sections 2 & 3; Township 13 North, Range 2 West, Sections 31 & 32; and Township 13 North, Range 3 West, Sections 33, 34, & 36, Seward Meridian.

Currently there is a Certificate of Reservation for the main stem of Campbell Creek; LAS 11973 became effective on May 15, 1991 and has a priority date of July 14, 1988. The reservation applies to stream flow within the main stem of Campbell Creek from approximately River Mile 2.0 upstream to approximately River Mile 7.8.

Background

Hydrology.[1]

Stream: Campbell Creek. No known variant names.

Reservation Description: The South Fork Campbell Creek is located within Township 12 North, Range 2 West, Section 2 & 3; Township 13 North, Range 2 West, Sections 31 & 32; and Township 13 North, Range 3 West, Sections 33, 34, & 36, Seward Meridian.

Stream: Campbell Creek. No known variant names.

Basin Area: The basin area to the USGS gage site (15274600) which is located 2.1 miles upstream from mouth, and 400 feet upstream from the bridge on Dimond Blvd is 69.7 miles^2.

Map Coverage: Anchorage Quad; 1:250,000

[1] Hydrologic information provided by Alaska Department of Natural Resources, Alaska Hydrological Survey, Mark Ingrahm, hydrologist.

Basin Description: The Campbell Creek basin is depicted in Figure 1. Both the North and South forks, principle tributaries of Campbell Creek, head in the Chugach Mountains and flow generally northwest to near their confluence, where the combined channel turns more southwest flowing to Turnagain Arm in the south Anchorage area. The highest points within the drainage are near Mount Williwaw (5445 feet) and O'Malley Peak (5105 feet). There are no mapped glaciers in the basin, however small lakes do exist near the headwaters area. The basin lies within the Chugach State Park and the Municipality of Anchorage. The lower portions of Campbell Creek flow through the increasingly urbanized area of south Anchorage.

Channel Description: Generally, the uppermost portions of the major Campbell Creek tributaries are all in steep mountainous terrain above timberline with high channel gradients. Gradients decline rapidly once exiting the mountains. Overall channel length is approximately 25 miles, with an overall gradient of approximately 130 feet per mile. Major tributaries to Campbell Creek include the North and South Forks, each with a description below. Generally, the North Fork has a both a smaller basin and steeper gradient channel than its larger neighboring South Fork.

North Fork: The North Fork of Campbell Creek (shown in Figure 1 in red) heads at Long Lake at an elevation of 3140 feet, and flows 12.8 miles to its confluence with the South Fork of Campbell Creek at 160 feet elevation. Average channel gradient through the North Fork is 232 feet/mile, however the uppermost half of the channel flows through steep mountainous terrain, most notably in the Campbell Creek Canyon reach, with gradients approaching 500 feet/mile. The entire North Fork is mapped as a single channel stream. The single USGS gage site on the basin (located approximately 2 miles above the mouth) measures a reported basin area of 13.4 miles^2. There are no named tributaries to the North Fork.

South Fork: The South Fork of Campbell Creek (shown in Figure 1 in Blue) heads at Green Lake near Powerline Pass at an elevation of 3000 feet and flows 16.6 miles to its confluence with the North Fork of Campbell Creek at 160 feet elevation. Average channel gradient through the South Fork is 180 feet/mile, however the uppermost half of the channel flows through steeper mountainous terrain with gradients approaching 300 feet/mile. The entire South Fork is mapped as a single channel. The Middle Fork Campbell Creek (shown in Figure 1 in yellow) is a major tributary to the South Fork. At the lower of the two USGS gage sites on the South Fork (located approximately 2 miles above the mouth) the USGS lists a basin size of 29.17 miles^2.

Climate: Below are listed climatic data for Anchorage as available through www.Alaska.com for the period of 1952-2000. Conditions at the headwaters would be colder and wetter.

ANCHORAGE
(Northern Cook Inlet, adjacent to Chugach Mountains)
Period of record: 4/1/1952 to 12/31/2000

Average annual high temperature	Average annual low temperature	Average annual total precipitation	Average annual total snowfall
42.9	28.9	15.71	70.6

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max temp	21.4	25.6	32.9	43.5	54.8	62.3	65.2	63.2	55.0	40.3	27.9	22.4
Min temp	8.1	11.3	17.3	28.5	38.7	47.3	51.4	49.4	41.3	28.2	15.9	9.7

Precip-tation	0.74	0.83	0.61	0.55	0.68	1.02	1.87	2.70	2.63	1.89	1.10	1.08
Snow-fall	9.6	12.1	9.2	4.9	0.2	0.0	0.0	0.0	0.3	8.0	11.5	14.9
Snow depth	10	11	9	3	0	0	0	0	0	1	4	8

Available Streamflow Data: Below is a chart of all USGS data collected in the Campbell Creek basin. In all, five sights have been gaged within the basin; including two sights on the South Fork; one on the North Fork; one on Little Campbell Creek; and one on the main lower channel. Monthly streamflow data are attached to the end of this summary.

SITE NAME	SITE NUMBER	START DATE	END DATE	YEARS OF RECORD	DATA GAPS	BASIN SIZE (MILES²)
SF Campbell C @ Canyon mouth nr Anchorage AK	15273900	10/1/1966	9/30/1981	15	YES	25
SF Campbell C nr Anchorage AK	15274000	7/1/1947	9/30/2001	54	YES	29.17
NF Campbell C nr Anchorage AK	15274300	6/1/1974	9/30/1984	10	NO	13.4
L Campbell C @ Nathan Dr nr Anchorage AK	15274550	10/1/1989	9/30/1990	1	NO	15
Campbell C nr Spenard AK	15274600	6/23/1966	6/30/1993	27	NO	69.7

Data Adequacy: With the exception of the Little Campbell Creek site that has only one year of data, the data available is adequate to base an instream flow reservation. Some adjustment may need to be made to estimate flows in particular reach using the above referenced data for calibration.

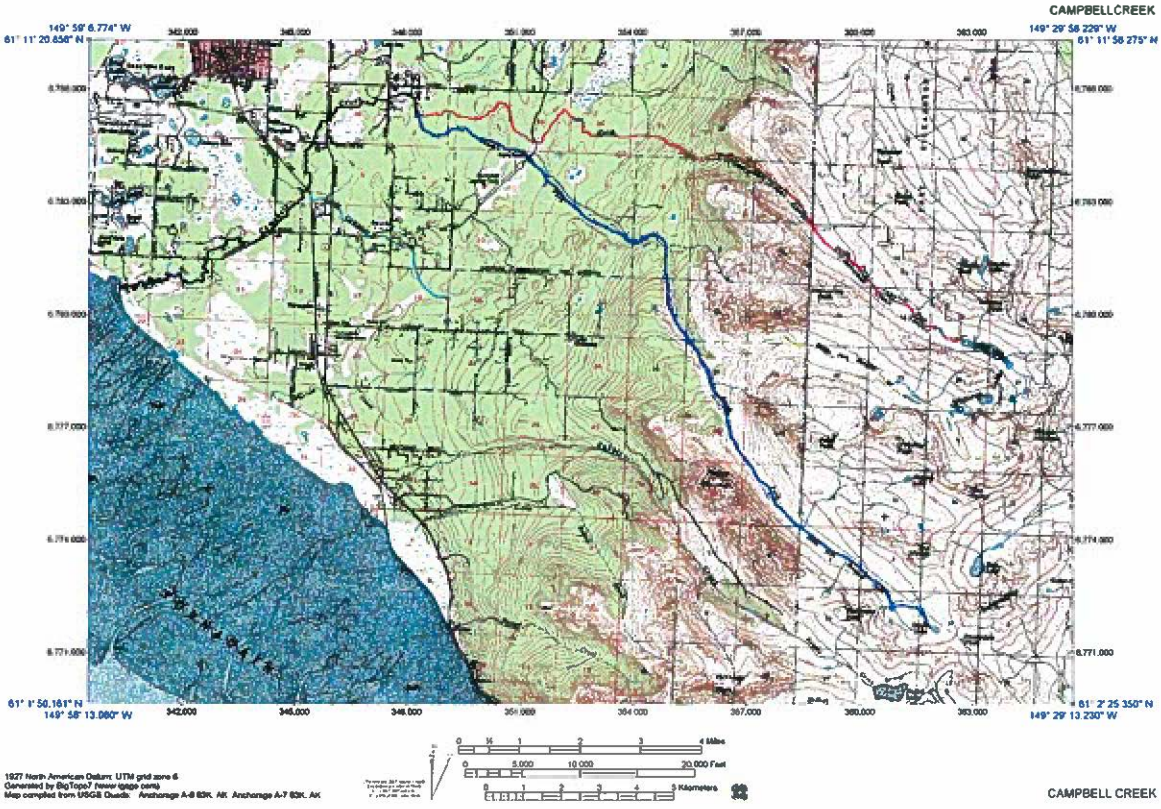
Water Quality: USGS water quality sampling took place on various locations and dates from 1949-1986, including biological, nutrient, organic and inorganic, physical, and suspended sediment. Detailed water quality data from Campbell Creek can be obtained from the USGS.

Navigability: Per an e-mail dated Aug 17, 2005 from Kathy Atkinson, State Navigability Determinator determined Campbell Creek is navigable. No official written determination has been done at this time.

Other Data: Unknown.

Comments: None.

Figure 1: Campbell Creek Basin.



Existing land-use plans, values and uses:

Discussion: The following land management plans all address land use issues for property around the proposed South Fork Campbell Creek Instream Flow Reservation. The Municipality of Anchorage has two plans for the area, A Wetlands plan written in 1996 and Anchorage 2020, Anchorage Bowl Comprehensive Plan. The State of Alaska, Division of Parks and Recreation wrote The Chugach State Park Master Plan in 1980 and the Bureau of Land Management wrote the Campbell Tract Master Plan, 2004.

The headwaters of Campbell Creek are within the Chugach State Park and runs through the Municipality of Anchorage through many residential and business areas. Because of its proximity, visibility and accessibility with respect to Anchorage it is an area that must accommodate and withstand heavy use[2]. The Chugach State Park Management plan's objectives are to preserve the Campbell Creek watershed and develop public access use areas without damaging the integrity of the watershed. There is a 100 foot forested buffer to remain on either side of Campbell Creek, creating a green belt where no further development may occur to help protect the watershed's integrity.[3]

[2] Anchorage 2020 Anchorage Bowl Comprehensive Plan pp22-34
[3] Chugach State Park Master Plan pp 59.

The MOA Wetlands Plan designates and provides data on wetlands within the MOA. Lands along the Campbell Creek and in the general area are designated Class A and are considered to have the highest resource value among MOA wetlands. This is based on their hydrologic, habitat and social functions, and their importance to the health of the stream systems they feed.[4] The plan states that a 100-foot non-disturbance buffer shall be maintained along Campbell Creek, due to the creek being an anadromous fish stream. The plan requires that run-off from any new development shall be treated before entering the creek[5].

Department of Defense transferred ownership of 730 acres to Bureau of Land Management in 1971 for their administrative facility, which is now known as the Campbell Track, located within the South Fork IFR. BLM supports the following functions located within the CT: Campbell Creek Science Center, Radio Communication Site, Airstrip, Calibration Monuments, and Recreational Management. The land use plan, states, "When the use of the land is in the public interest, the Bureau shall retain ownership"[6]. Based upon the current and anticipated use and the public input the CT area will be managed for recreation with minimal impact upon the terrestrial or aquatic habitat. The South Fork of the Campbell Creek runs through the BLM, Campbell Creek Track.

The South Fork Campbell Creek supports three species of salmon, the chinook (*Oncorhyncus tshawytscha*), coho (*O. kisutch*), pink (*O. gorbuscha*), and as well as rainbow trout (*O. mykiss*), and dolly varden (*Salvelinus malma*).[7]

Determination: Most of the suitable land within the Anchorage Bowl has already been developed. There are no indications of future development plans along the South Fork Campbell Creek. The area land management plans all intend to manage the Campbell Creek greenbelt for recreation and watershed water quality, to minimize impact on the South Fork Campbell Creek. The proposed reservation will contribute importantly to both the maintenance of the South Fork Campbell Creek water quality, fish populations and the health of Campbell Creek system sport fishery.

Findings and Legal Conclusions

Under Article 8 of the Alaska Constitution and AS 46.15.030, naturally occurring water is reserved to the people for common use and is subject to appropriation and beneficial use; AS 46.15.030 and AS 46.15.145 further provide for the reservation of instream flows in rivers and water levels in lakes. Title 11, Chapter 93 of the Alaska Administrative Code contains the regulations under which DNR manages the State's water resources, including Sections .141 through .147 pertaining to Instream Flow Reservations.

These findings and legal conclusions are issued pursuant to the following authorities:

Under AS 46.15.145(c),

The commissioner shall issue a certificate reserving the water applied for under this section if the commissioner finds that

(1) The rights of prior appropriators will not be affected by the reservation;
(2) The applicant has demonstrated that a need exists for the reservation;

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[4] Municipality of Anchorage Wetlands Coastal Management Plan Enforceable Policies, pp5-24
[5] MOA wetland, pp3
[6] Campbell Tract Facility Master Plan, March 2004, pp2-9
[7] Application at A-3.

(3) There is unappropriated water in the stream or body of water sufficient for the reservation; and
(4) The proposed reservation is in the public interest.

Under 11 AAC 93.146(a), "The commissioner will issue a certificate of reservation of water if the commissioner finds that the reservation meets the requirements of AS 46.15.145."

Under 11 AAC 93.145(d),

The commissioner's decision to grant, conditionally grant, or deny an application for a reservation of water will be summarized by written findings of fact and conclusions of law, including justification of any special conditions to which the reservation is subject. In determining whether the proposed appropriation is in the public interest, the commissioner will consider the criteria set out in AS 46.15.080(b).

The following findings of fact and conclusions of law respond to the above requirements.

AS 46.15.145(c)(1): The rights of prior appropriators will not be affected by the reservation.

There were no objections to the proposed reservation reach from prior appropriators.

Based on a search of DNR's water rights records, there are no other existing surface appropriators of record for the South Fork Campbell Creek. There is one subsurface water right withdrawal for the South Fork Campbell Creek, LAS 18757, BLM Science Center, for 6000 gpd.

The rights of prior appropriators cannot be affected by the proposed reservation, since prior appropriators are not obligated to respond to a priority call to reduce diversion and use in the event of stream flows if the reservation reaches go below the reserved amounts. Consideration of prior appropriators is here made in recognition of a theoretically possibility hydrological connection between ground water withdrawals and flows in the South Fork Campbell Creek; however ADNR has no evidence regarding such a hydrologic connection.

AS 46.15.145(c)(2): The applicant has demonstrated that a need exists for the reservation.

Discussion. Under Title 16 of the Alaska Statutes, ADF&G is the state agency charged with managing Alaska's fish and wildlife. The primary purpose of ADF&G's reservation application is the protection of fish and wildlife habitat, migration and propagation. The application asserts that

This instream flow reservation is required to protect and maintain fish production within South Fork Campbell Creek and other portions of the Campbell Creek drainage....a reduction in flow will reduce the quality of habitat in this stream.[8]

Thus, in the judgment of the state's fish and wildlife management agency, the reservation is needed to maintain fish production within the stream.

This reservation will aid ADF&G in carrying out its duty of managing the state's fish and wildlife. Under the Tennant method of evaluating the habitat potential of waterbodies, modified for Alaskan conditions and employed in this reservation application, if stream flows are diminished sufficiently the result will be

[8] Application, Appendix A

a measurable decline in the ability of a stream to produce fish. Conversely, an instream flow reservation can protect fish production while safely allowing for other appropriation of stream flows in excess of reservation amounts.

Finally, the experience of other western states suggests that it is prudent to protect necessary instream flows as early as possible in order that these flows and the uses that depend upon them do not have to be protected later when available water may be more scarce, and constitutional, statutory or public trust requirements may be more difficult to meet.

Determination.

In light of the above factors, it is determined that the applicant has demonstrated that a need exists for the proposed reservation.

AS 46.15.145(c)(3): There exists unappropriated water within the stream sufficient for the reservation.

Discussion. According to USGS records on South Fork Campbell Creek, station # 15274000 stream flows in Campbell Creek are sufficient to accommodate the proposed reservation, and as reflected in the application the reservation has in fact been designed to reflect these documented flow levels.
The following table shows the percentages of time that the proposed reservation flow is available during each listed period of the year*:

South Fork Campbell Creek		
Time Period	**Flow Rates in Cubic Feet Per Second (CFS)**	**Percent Exceedance**
January	8	85
February	7	70-75
March	6	70-75
April	6	70
May 1 -15	11	70
May 16-31	29	75
June	68	75
July	54	75
August	43	75
September	38	70-75
October	31	70
November	20	70
December	8	95-100

* Percent exceedances are calculated for each period, from daily flow data.
The data demonstrate that, while almost any allocation of water may experience periods of time during which natural variability in flow will result in unavailability of water, there will be a reasonable proportion of time when South Fork Campbell Creek flows will be sufficient for the proposed reservation.

Determination. It is determined that there exists unappropriated water within the stream sufficient for the reservation.

AS 46.15.145(c)(4) and 11 AAC 93.145(d): The proposed reservation is in the public interest, considering the criteria set out in AS 46.15.080(b).

AS 46.15.080(b)(1): The benefit to the applicant resulting from the proposed reservation.

Discussion. ADF&G has the statutory responsibility of managing the fish and game resources of the State of Alaska. ADF&G has applied for the reservation for the primary purpose of sustaining fish production in South Fork Campbell Creek.[9] Thus, by definition the proposed reservation will benefit ADF&G by aiding in the management of fish resources in Campbell Creek, and aid ADF&G in serving the anglers who would like to fish Campbell Creek salmon, trout and dolly varden. The proposed instream flow reservation would contribute significantly to ensuring the continued viability of this resource and recreational use.

Further, the proposed Campbell Creek reservation provides a way for ADF&G to provide for the health of Campbell Creek fish populations while also accommodating other potential future development needs. Finally, Campbell Creek was selected as high-priority by the applicant in a process that involved gathering and evaluating input from all the divisions of ADF&G. Establishing this reservation will further benefit ADF&G by implementing the applicant's priority reservation strategy.

Determination. The proposed reservation will significantly benefit the applicant in the fulfillment of its statutory responsibility to manage Campbell Creek fish populations, a resource reserved to the people under the Alaska Constitution. The proposed reservation will contribute importantly to both the maintenance of Campbell Creek fish populations and a healthy Campbell Creek system sport fishery.

AS 46.15.080(b)(2): The effect of the economic activity resulting from the proposed reservation.

Discussion. Sport fishing provides significant economic benefits to Alaska. The American Sport fishing Association estimated that the expenditures for sport fishing in Alaska in 2001 generated 11,064 jobs, $238 million in wages and salaries. These jobs and income rippled through the economy to generate an estimated total of $960 million in spending. A survey by the University of Alaska's Institute for Social and Economic Research estimated the total economic significance of sport fishing in 1993 at 9,236 jobs, $209 million in payroll, and $637 million in sales.[10]
ADF&G notes that :
People who participate in sport fishing would be quick to point out that the chance to go fishing has a value that cannot be measured in dollars and cents. However, sport fishing is also a moneymaking industry and a vital source of income to many in small towns and cities throughout the state.
[11]Determination. While no detailed breakdown exists of the economic impacts of the Campbell Creek system sport fishery, the protection of this sport fishery is likely of significant economic benefit to the region, and the proposed reservation will help protect that value.

AS 46.15.080(b)(3): The effect on fish and game resources and on public recreational opportunities.

Discussion. Campbell Creek supports three species of salmon, chinook (*Oncorhyncus tshawytscha*), coho (*O. kisutch*), pink (*O. gorbuscha*), as well as rainbow trout (*O. mykiss*), and Dolly Varden (*Salvelinus malma*.[12]

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[9] Application at appendix A.
[10] ADF&G Sport Fish Division, http://www.sf.adfg.state.ak.us/statewide/html/SFeconomics.stm.
[11] Fish and Game Id.
[12] Application at A-8.

The reservation's primary purpose is to protect the habitat, migration and propagation of these fish. Reservation levels were designed specifically to provide for the biological needs of fish populations at the times those populations utilize the stream for their various life stage activities of spawning, incubation, rearing, and passage.[13]

Based on the results of Tennant Method instream flow analysis, the proposed reservation will provide for (see table)

Period	Tennant Method Flow Classification
January	Good
February	Good
March	Good
April	Good
May 1 – 15	Excellent
May 16 –30	Optimum
June	Optimum
July	Optimum
August	Optimum
September	Optimum
October	Optimum
November	Optimum
December	Good

[14]

Specific reservation flow levels recommended by ADF&G were subsequently adjusted to better mimic the local hydrology and biologic requirements for Campbell Creek by combining Tennant Method analyses, analyses of hydrologic variability, and fish species periodicity. During the adjudication of this application, these analyses were reviewed and discussed by both the applicant and DNR. This led to a mutual agreement for a final flow regime, which is considered adequate, consistent with the current level of hydrologic and biologic knowledge, to protect fish habitat, migration and propagation within the reservation reach.

The primary purpose of the proposed reservation is to sustain fish production in South Fork Campbell Creek.

Determination. The proposed reservation will be of substantial benefit to both fish resources and public recreational activities.

AS 46.15.080(b)(4): The effect on public health.

Discussion. There are no permitted surface water withdrawals from South Fork Campbell Creek for drinking water purposes. Human uses of the river are currently and are expected to continue to be for recreational, fisheries and natural amenity values. Human public health impacts are expected to be negligible.

[13] Application at A figures 3.
[14] Id. table

Determination. The proposed reservation will generally contribute to the maintenance and protection of water quality by ensuring the presence instream of a volume of water that can buffer extreme temperature changes and dilute concentrations and thus reduce impacts of any pollutants or contaminants that may enter the creek.

AS 46.15.080(b)(5): The effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed reservation.

Discussion. The Anchorage Bowl Community Plan, Anchorage Wetlands Management Plan, and BLM Land Management Plans all address management issues within the South Fork Campbell Creek area for wildlife habitat protection and to provide recreational opportunities. A reservation of water does not preclude the use of reserved water for any purpose compatible with the reservation, such as recreation.

Determination. Therefore, it is determined that no existing or planned alternative use currently exists that might be precluded or hindered by the proposed reservation.

AS 46.15.080(b)(6): Harm to other persons resulting from the proposed reservation.

Discussion. DNR received no objection to the proposed reservation.
There are no other surface water appropriators of record from South Fork Campbell Creek, nor any applicants for such appropriations. There is one subsurface water right withdrawal for the South Fork Campbell Creek, LAS 18757, BLM Science Center, for 6000 gpd.

Determination. The proposed reservation thus is not expected to harm other persons.

AS 46.15.080(b)(7): The intent and ability of the applicant to complete the reservation.

Discussion and Determination. The applicant has adequately described, justified, and quantified the proposed reservation and no further action on the part of the applicant is required to complete the reservation.

AS 46.15.080(b)(8): The effect upon access to navigable or public water.

Discussion and Determination. The proposed reservation is not expected to have any effect on access to navigable or public waters. The reservation will have the incidental benefit to navigation of protecting the reservation reach from water withdrawals that would reduce flows below the reservation amounts, which could be adequate for shallow-draft craft. . No analysis of flow needs for navigation has been made, however.

AS 46.15.080 public interest determination.

In light of the substantial public benefits described above, and in light of the relative lack of countervailing harms, the proposed South Fork Campbell Creek instream flow reservation is determined to be in the public interest.

Responses to Public Notice

Public notice was provided as required by 11 AAC 93.144, 11 AAC 93.080 and AS 46.15.133. Timely responses were received from the Municipality of Anchorage, Mary Lu Harle and Jan Konigsberg; all had no objections and were supportive of the reservation.

Decision

In light of the above findings and conclusions, the Alaska Department of Natural Resources finds that the Alaska Department of Fish and Game has satisfied the requirements of AS 46.15.145 with respect to its application for a reservation of water in South Fork Campbell Creek, LAS 13222. Under 11 AAC 93.146(a), DNR will issue a Certificate of Reservation in the amounts, for the time periods, and for the reach described in "Description of the Proposed Reservation," above.

The findings and conclusions presented above have been reviewed and considered. The case file has been found to be complete and the requirements of all applicable statutes have been satisfied. Therefore, it is the determination of the Division of Mining, Land and Water that the granting of this proposed reservation of water is in the best interest of the State of Alaska under authority of AS 46.15, the Alaska Water Use Act.

Lana Davis
Instream Flow Coordinator

11/7/05
Date

Gary Prokosch
Chief, Water Resources Section

11/7/05
Date