

**Jordan River Project Water Use Plan**

**Monitoring Surfing Quality below the Jordan  
River Generating Station**

Reference: JORMON#5

*Monitoring Surfing Quality Below the Jordan River Generating  
Station*

Study Period: February – April 2006

RRL Recreation Resources Ltd.

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## Executive Summary

### Background



Jordan River is one of the most popular surf locations on Vancouver Island. The surf season extends between October and March, and surf quality can vary depending on ocean conditions over this period.

A surfing survey conducted over the Water Use Plan (WUP) between December 17<sup>th</sup>, 2000 and March 16<sup>th</sup> 2001 indicated that surf conditions are also affected by Jordan River Generating Station (JOR GS) discharge. In some conditions high discharges may flatten waves making it more difficult for surfers to catch waves against the current.

The final alternative agreed to by the consultative committee includes provision for a minimum of four (4) weekend days during the month of March when maximum discharge will be limited to  $30\text{m}^3\text{s}^{-1}$  during the day. The potential benefit of this flow will be evaluated during this monitoring program which is scheduled to occur over a six-year period.

The 2006 survey was completed on March 11, March 12 and April 1, 2006. The survey contractor went on site on March 25<sup>th</sup>, 2006, however, there was no surf and no surf users were in the water on that day.

The 2006 survey had 15 questions and was conducted using in-person interviews. The focus of the surfing survey was to determine the benefits to the surfing quality at Jordan River as a result of constraints on generation.

A total of 40 surveys were completed over the period March 11 – April 1, 2006. The lower number of surveys completed can be attributed primarily to the poor surf conditions during this period that attracted few surf users and consequently few surf user surveys were completed.

## Results Summary

Key observations of the 2006 Monitoring Program are summarized below:

- The primary users of Jordan River are board surfers.
- 37% of surf users rated their experience as poor to fair, and 63% rated the experience as good to excellent despite generally poor surf conditions.
- Half of the respondents, 50%, had surfed for less than five years suggesting overall lower levels of experience than in the previous surf user survey, where 66% had more than 5 years experience.
- The maximum number of users in the water during the on-site survey times was 17. The maximum number in the water in 2000-2001 was 22.
- The survey results show a group of experienced local surfers continue to surf Jordan River on a regular basis.
- Shakies Beach and Points Left were the most popular surfing areas.
- 87% of users lived within 100 km of Jordan River. This correlates well with the amount spent. 55% of surfers spent \$10-\$25 for each surf day, including transportation, meals and accommodation. This would cover fuel and one or two meals for a surfer driving out to Jordan River from Sooke or Victoria.
- 82% of surf users observed that the water discharge from Jordan River did not affect their surf experience. During this survey period, flows from the Elliot Head Pond were 100% constrained (no flow). In the 2000-2001 study, users were correct 57% of the time in identifying whether there was water discharge or not.
- The benefits of the constraint, which were expected to improve surf quality through reduced current and increased water quality, were difficult to assess during this monitoring period. This was due in part to the small surf conditions, and also due to low numbers of surf users and the fact that 50% of the users had surfed for less than five years.

## 1.0 2006 Survey Objective and Scope



The objective of the surf-monitoring program is to assess the performance of the Water Use Plan decision to constrain maximum discharge opportunistically during the surfing season, using surf quality as the performance measure.

The monitoring program will be assessed near the mouth of the Jordan River in the intertidal zone where surfing is prevalent. It will evaluate the surf quality of waves that are particularly vulnerable to Jordan River Generating Station operations, based on the response of experienced surfers.

Surf quality will be evaluated under two conditions: constrained and unconstrained generation discharge, alternating over the review period of six years. 2006 is designated as a constrained discharge observation period. 2007 will be an unconstrained discharge observation period.

The objectives of the 2006 Jordan River surf users monitoring program were to:

1. Develop baseline information on daily surf use for high use weekends.
2. Determine user residency and activity preferences.
3. Define how often individuals surf at Jordan River on an annual basis.
4. Assess the correlation between discharge from the generating station and surf quality.
5. Record weather and tide information during the periods of surf survey administration.
6. Establish a monetary value for a surfer's day.

## 2.0 Survey Methodology



The survey of Jordan River surf users commenced March 11, 2006 and was delivered on site through in-person interviews. The surf user survey was explained to the user and was completed by either Erin Prescott or Jeremy Webb.

The survey was conducted on March 11, 12, 25 and April 1, 2006. On March 25<sup>th</sup> there was no surf and no surfer users were observed at Jordan River and no data was collected. The decision was made not to conduct the survey on March 26 as similar conditions to the 25<sup>th</sup> were forecast.

The 2006 survey was designed to measure the factors contributing to the surf users experience at Jordan River so as to determine how constraints on power generation affected surfing quality.

There is a short 'window' where the surf user can be interviewed, after they come out of the water, before they wish to get changed and warm up. The length of time it took to complete each survey appeared appropriate, with no users objecting to the survey being too long.

The survey questions were straightforward and generated only normal requests for clarification. Refer to Appendix A to view the Surf Users Survey template.

In addition to the surf user survey, the number of surf users in the water and their locations were observed and recorded at approximately half hour intervals. Weather observations were also made and recorded at approximately one-hour intervals.

### 3.0 Survey Results



A total of 38 surveys were completed, (significantly less than the 116 surveys collected in 2000/2001). All were completed correctly. None of the surf users were surveyed more than once.

### 3.1 User Group Profile

#### User Activities

The survey records the type of surf use.

Board		Body		Boogie		Windsurf		Kayak Surf		
Male	Female	Male	Female		Male	Female	Male	Female	Male	
18	7									March 11
5	1							1	1	March 12
2	3									April 1 2006
<b>25</b>	<b>11</b>							<b>1</b>	<b>1</b>	<b>Totals</b>

The majority of surf users at Jordan River are board users. This is consistent with the 2000/2001 survey which also indicated board users were dominant.

### 3.2 Surf User Experiences

A series of four questions was used to try and differentiate the elements contributing to surf users experiences.

Getting on to a wave in order to ride it is one of the fundamental challenges of surfing, and is a skill that develops with knowledge and experience, including familiarity with an area and its characteristics.

How would you rate the conditions for catching the waves?								
Poor		Fair		Good		Excellent		
Male	Female	Male	Female	Male	Female	Male	Female	
2	2		1					April 1 2006
3		3	1		1			March 12, 2006
2		8	5	7	2	1		March 11, 2006
<b>7</b>	<b>2</b>	<b>11</b>	<b>7</b>	<b>7</b>	<b>3</b>	<b>1</b>		<b>Totals</b>

The surf was unusually poor during this year's survey period, (a time of year when good surfing conditions are expected). Most surf users felt conditions for catching waves were poor to fair. Over the survey period, 24% of surfers rated conditions as poor, 47% as fair, 26% as good and 3% as excellent.

The higher the wave, the better the ride. Waves were small this year, and most surf

users gave wave height a poor to fair rating.

How would you rate the wave height?								
Poor		Fair		Good		Excellent		
Male	Female	Male	Female	Male	Female	Male	Female	
3			2					April 1 2006
5		1	1	1				March 12, 2006
5	2	4	2	7	2			March 11, 2006
<b>13</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>2</b>			<b>Totals</b>

Wave height averaged less than 1 metre over the survey period. 42% of surf users rated wave height as poor, 29% as fair, and 29% as good.

The way in which waves break affects the surfer's ride in several ways and a good wave break is much sought after. At Jordan River, as is the case at other well-known surf areas, surf users name established areas of break. There are four surf breaks at Jordan River: Shakies Beach, Outside River Mouth, Points Left and Points Right.

How would you rate the wave break?								
Poor		Fair		Good		Excellent		
Male	Female	Male	Female	Male	Female	Male	Female	
	1	2	2					April 1 2006
4		2	1	1				March 12, 2006
2	1	5	1	8	4	1	1	March 11, 2006
<b>6</b>	<b>2</b>	<b>9</b>	<b>4</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>Totals</b>

Although surf conditions were rated as poor to fair by 71% of users, in the case of rating the wave break, 58% users rated it as poor to fair, 36% rated it as good, and 6% rated it was excellent.

Once on a wave, the surfer rides it and generally the longer the ride the better.

How would you rate the length of ride?								
Poor		Fair		Good		Excellent		
Male	Female	Male	Female	Male	Female	Male	Female	
1	3	1						April 1 2006
3		4	1					March 12, 2006
2	2	10	3	2	2	2		March 11, 2006
<b>6</b>	<b>5</b>	<b>15</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>2</b>		<b>Totals</b>

30% of surfers rated the ride length as poor, 53% as fair, 11% as good and 6% as excellent. The majority, 83% rating the ride length as poor to fair is consistent with the surf conditions present during the survey period. Two experienced surfers from Vancouver who surfed the Points Right break made the excellent ratings.

In an attempt to gain a rating from surf users that focused less on specific elements and more on the combination of elements contributing to their experience, surf users were

asked to rate their overall experience while out on the water. The hope was that a picture would emerge showing how surf conditions affected their experience.

How would you rate the quality of your surfing experience today while you were in the water?								
Poor		Fair		Good		Excellent		
Male	Female	Male	Female	Male	Female	Male	Female	
	1			1		1	2	April 1 2006
		2	1	3	2			March 12, 2006
1		8	1	8	2	3	2	March 11, 2006
1	1	10	2	12	4	4	4	<b>Totals</b>

37% of surfers rated their experience as poor to fair, and 63% rated the experience as good to excellent, suggesting that while surf conditions were unremarkable, they provided conditions that pleased most users.

What other factors the surf users consider other than the surf conditions when making their rating isn't known. However, experienced surfers typically check the conditions at Jordan River before going out, accounting perhaps for the majority of users having 0-4 years experience, and thus finding the conditions favorable to their level of experience.

### 3.3 Influence of River Flow

During the survey period, flows from the Jordan River dam were reduced and surf users were asked if they noticed the flow from the Jordan River (of which there was none as the flow was fully constrained by the Jordan River dam).

Did you notice if the water discharge from the Jordan River affected your water activity?				
Yes		No		
Male	Female	Male	Female	
		2	3	April 1, 2006
		6	2	March 12, 2006
5	2	15	3	March 11, 2006
5	2	23	8	<b>Totals</b>

The majority, 82% of surf users, did not notice river discharge affecting their experience. Interestingly, although there was no river discharge, 18% of surfers on March 11<sup>th</sup> indicated they did notice river discharge. Of this 18%, most had limited surf experience (for some it was their first or second time surfing) which may partially explain the rating as these users would be expected to have less ability to interpret the various sea current and tide actions than more experienced users.

### 3.5 Surf User Numbers

During the 2006 survey period, the maximum number of surfers in the water at any one time was 17 surfers.

In 2001, the maximum number of surfers in the water at any point in time, during the on-site surveys, was 22 surfers. Although there has been a significant increase in use at Jordan River since the first surf user surveys were completed in 2001, this increase was not observed during the 2006 monitoring period.

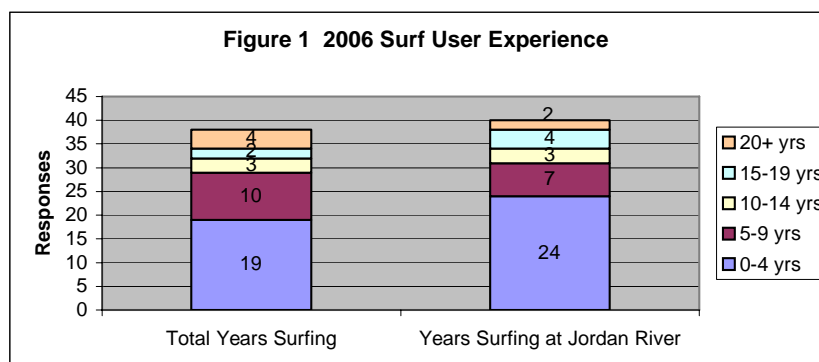
Number of surf users in the water, March 11, March 12, April 1, 2006													
		0930	1000	1030	1100	1130	1200	1230	1300	1330	1400	1430	1500
Mar. 11	Pts R	5		4	3	3	1	2	6	4	4	1	3
	Pts L	3		6	7	4	4	5	4	2	3	3	0
	Out	0		1	5	5	3	7	6	6	5	1	(1)
	Shake	4(1)		2	2	3	4	1	0	2[2]	3[1]	4	0
<b>Total</b>		<b>13</b>		<b>13</b>	<b>17</b>	<b>15</b>	<b>12</b>	<b>15</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>9</b>	<b>4</b>
Mar. 12	Pts R		0	0	0	0	0	0	0	0	0		
	Pts L		0	0	0	0	0	0	0	0	0		
	Out		0	0	0	0	0	0	0	0	0		
	Shake		0	3	7	6	6	3	1	1(2)	1(2)		
<b>Total</b>		<b>0</b>	<b>0</b>	<b>3</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>		
April 1	Pts R		0	0	0	2	0	2	0	0	0	0	0
	Pts L		0	0	0	0	0	0	0	0	0	0	0
	Out		0	0	0	0	0	0	0	0	0	0	0
	Shake		0	0	0	0	2	0	0	0	0	0	0
<b>Total</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### Notes:

1. Pts R = Points Right/Pts L = Points Left/Out = Outside/Shake = Shokies Beach
2. Numbers in ( ) are kayak surfers, numbers in [ ] are boogie board surfers, and numbers outside of the brackets are board surfers.

### 3.6 User Experience

For some of the surfers surveyed, it was their first time surfing anywhere. At the other end of the spectrum were a limited number of surfers who have been surfing for over 20 years. The majority have been surfing 0-4 years. Over half of the respondents, 60% had surfed at Jordan River for less than five years and 50% of respondents had surfed for less than five years overall in any location including Jordan River.



### 3.7 Number of Surfing Days

The number of days individuals surf at Jordan River each year varied from once per year, to over 60 times per year.

Number of days surfing at Jordan River per year					
0-9	10-19	20-29	30-39	40-59	60+
9	7	6	4	4	8

### 3.8 User Residency

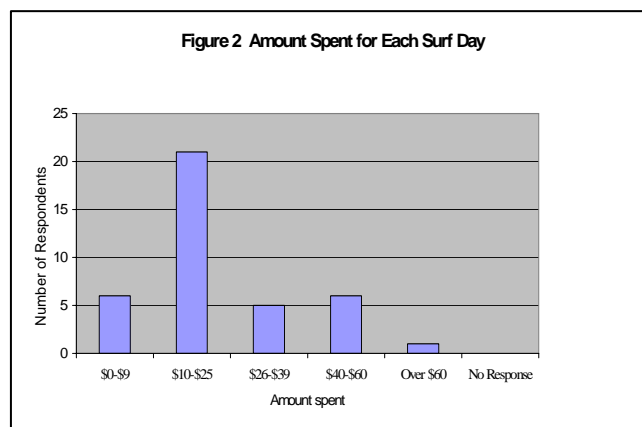
Surf users were asked where they lived.

Residency of surfers at Jordan River				
Within 50 km	50-100 km	100+ km	Other Canadian Area	Non Canadian
14	19	5	0	0

36% of surf users lived within 50 km of Jordan River, 50% lived 50-100 km, 14% live 100 km or greater from Jordan River. All individuals were from BC.

### 3.9 Amount Spent

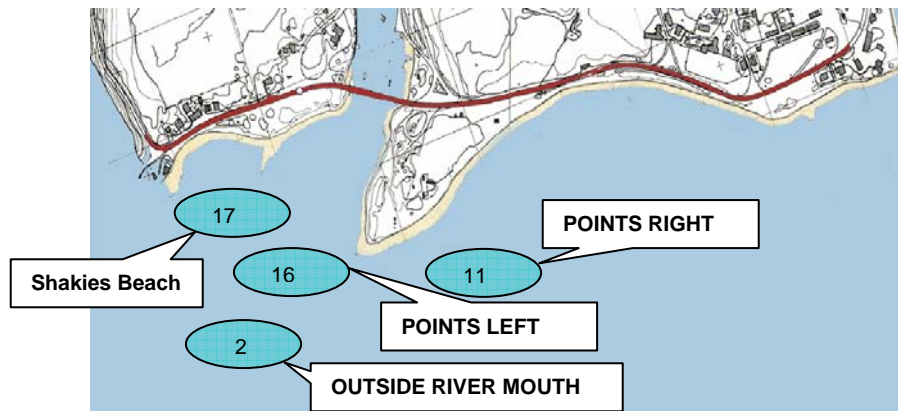
Surf users were asked the total spent for each surf day including transportation, meals and accommodation (including taxes).



16% of respondents indicated that they spent approximately \$0-\$9 on each surf day, including transportation, meals and accommodation (see Figure 2). 55% of respondents interviewed spent \$10 - \$25 for each surf day. 13% indicated they spent \$26-\$39, 13% indicated spent \$40-60, and one individual indicated he spent over \$60 per surf day.

### 3.9.1 Surfing Location

Surfers were asked where they surfed during their time at Jordan River. Some surfers used two locations during their time in the water. The most used areas for surfing were Shakies Beach and Points Left. The map below shows the number of surfers using each area over the survey period.



## 4.0 Summary of Observations



The prime surfing season continues to be November to March, with opportunities for good surfing also occurring outside of the high season, i.e. September and October.

In 2000-2001, 116 surf user surveys were completed and the study extended its analysis to encompass environmental influences upon surf user experiences at Jordan River. These influences included tides, swell from offshore winds and near shore wind and wave conditions.

The 2006 study collected 38 surveys during the monitoring period. This small sample size, combined with poor surf conditions and lower overall surfer experience does not justify extensive analysis. However, a number of observations can be made:

- Primary users of the Jordan River surf area are board surfers.
- 37% rated their experience as poor to fair, and 63% rated the experience as good to excellent, this despite generally poor surf conditions.
- Half of the respondents, 50% had surfed for less than five years suggesting overall lower levels of experience than in the previous surf user survey, where 66% had more than 5 years experience.
- The maximum number of users in the water during the on-site survey times was 17.
- The survey results show a group of experienced local surfers who surf Jordan River on a regular basis.
- Shakies Beach and Points Left were the most popular surfing areas.
- 87% of users lived within 100 km of Jordan River. This correlates well with the amount spent. 55% of surfers spent \$10-\$25 for each surf day, including transportation, meals and accommodation. This would cover fuel and one or two meals for a surfer driving out to Jordan River from Sooke or Victoria.
- 82% of surf users observed that the water discharge from the Jordan River did not affect their surf experience. During this survey period, flows from the Elliot Head Pond were 100% constrained (no flow).

## 5.0 Recommendations



To ensure the surf survey is finalized and survey staff are in place to begin work the first week of March 2007, sufficient time for review, revision and survey administration should be provided. The surf user survey questions should be finalized well in advance of the study dates next year and survey staff time should be scheduled and committed.

Setting a survey review completion date and a confirmed survey staff schedule by the end of January 2007 is recommended.

The same surf user survey, (with minor modifications/updates as required), and the same monitoring standards should be used in administering the next surf user survey to ensure consistency in data collection.

## Appendix A – 2006 Surf Survey

### Attention Jordan River Surf Users!

As part of BC Hydro's Jordan River Water Use Plan Monitoring Program, a survey of Jordan River surf users is being undertaken. A hydroelectric dam controls the amount of water that flows in the Jordan River. Of particular interest is how the amount of water discharge from the hydroelectric dam may affect surfing conditions.

BC Hydro has contracted an independent consulting company, RRL Recreation Resources Ltd. (RRL) to undertake the surf user survey. If you have any questions regarding the survey, you can call them, toll free at 1-800-761-5737. Thank you for participating!

### Jordan River Water Use Plan - Ocean Surf Recreation User Survey

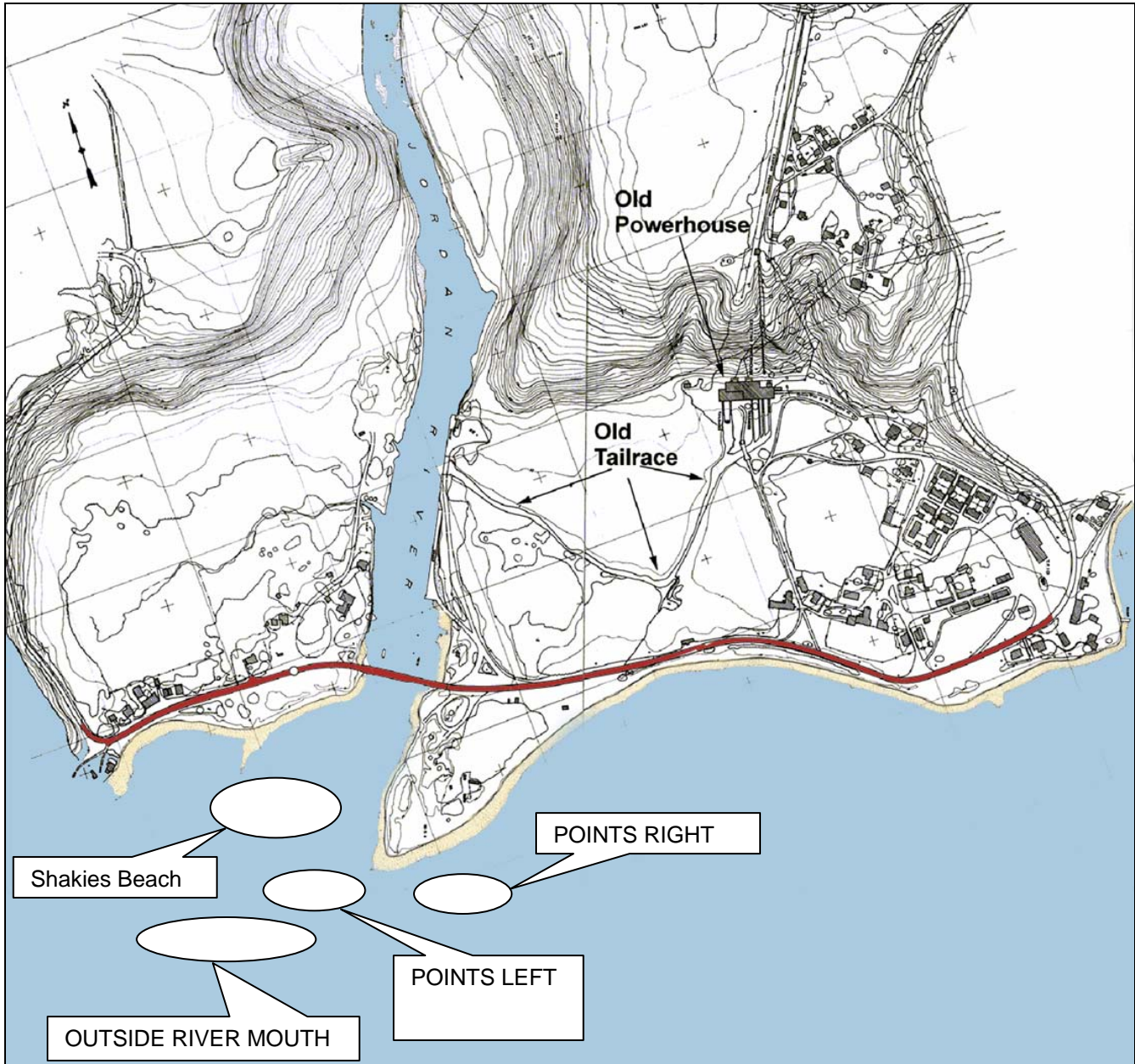
1. **Date/time:** (Month/Day/Year/time) \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ am/pm
2. **Time in Water:** Time in \_\_\_\_\_ am/pm - Time out \_\_\_\_\_ am/pm
3. **Activity Undertaken:**
  - Board Surf  Body surf  Boogie Board  Wind Surf  Kayak Surf
  - Other (describe) \_\_\_\_\_
4. **How would you rate the conditions for catching the waves?**
  - Poor  Fair  Good  Excellent
5. **How would you rate the wave height?**
  - Poor  Fair  Good  Excellent
6. **How would you rate the wave break?**
  - Poor  Fair  Good  Excellent
7. **How would you rate the length of ride?**
  - Poor  Fair  Good  Excellent
8. **How would you rate the quality of your surfing experience today while you were in the water?**
  - Poor  Fair  Good  Excellent
9. **Did you notice if the water discharge from the Jordan River affected your water activity?**
  - Yes  No

If answering yes to Question 9, please describe how your activity was affected.

\_\_\_\_\_
10. **Have you been interviewed before?**
  - Yes  No
11. **How many years have you been surfing at Jordan River?** \_\_\_\_\_
12. **How many years have you been surfing?** \_\_\_\_\_
13. **On average, how many days do you surf at Jordan River each year?** \_\_\_\_\_
14. **Where do you live?**
  - Within 50 km  50-100 km  100+km  Other Canadian area \_\_\_\_\_  Non-Canadian \_\_\_\_\_
15. **How much do you spend in total for each surf day, including transportation, meals and**

accommodation (including taxes)?  \$0-\$9  \$10-\$25  \$26-\$39  \$40 - \$60  over \$100

On the map below, please circle the location where you surfed: (Point Rights, Point Lefts, Shakies Beach, Outside Jordan River Mouth)



## Appendix B - Hourly Discharge Data For Jordan River Dam

Data Type	RES	Date	Hour	Value
REL	JOR - Elliott Headpond	3/11/06	1.00	0
REL	JOR - Elliott Headpond	3/11/06	2.00	0
REL	JOR - Elliott Headpond	3/11/06	3.00	0
REL	JOR - Elliott Headpond	3/11/06	4.00	0
REL	JOR - Elliott Headpond	3/11/06	5.00	0
REL	JOR - Elliott Headpond	3/11/06	6.00	0
REL	JOR - Elliott Headpond	3/11/06	7.00	0
REL	JOR - Elliott Headpond	3/11/06	8.00	0
REL	JOR - Elliott Headpond	3/11/06	9.00	0
REL	JOR - Elliott Headpond	3/11/06	10.00	0
REL	JOR - Elliott Headpond	3/11/06	11.00	0
REL	JOR - Elliott Headpond	3/11/06	12.00	0
REL	JOR - Elliott Headpond	3/11/06	13.00	0
REL	JOR - Elliott Headpond	3/11/06	14.00	0
REL	JOR - Elliott Headpond	3/11/06	15.00	0
REL	JOR - Elliott Headpond	3/11/06	16.00	0
REL	JOR - Elliott Headpond	3/11/06	17.00	0
REL	JOR - Elliott Headpond	3/11/06	18.00	0
REL	JOR - Elliott Headpond	3/11/06	19.00	0
REL	JOR - Elliott Headpond	3/11/06	20.00	0
REL	JOR - Elliott Headpond	3/11/06	21.00	0
REL	JOR - Elliott Headpond	3/11/06	22.00	0
REL	JOR - Elliott Headpond	3/11/06	23.00	0
REL	JOR - Elliott Headpond	3/11/06	24.00	0
REL	JOR - Elliott Headpond	3/12/06	1.00	0
REL	JOR - Elliott Headpond	3/12/06	2.00	0
REL	JOR - Elliott Headpond	3/12/06	3.00	0
REL	JOR - Elliott Headpond	3/12/06	4.00	0
REL	JOR - Elliott Headpond	3/12/06	5.00	0
REL	JOR - Elliott Headpond	3/12/06	6.00	0
REL	JOR - Elliott Headpond	3/12/06	7.00	0
REL	JOR - Elliott Headpond	3/12/06	8.00	0
REL	JOR - Elliott Headpond	3/12/06	9.00	0
REL	JOR - Elliott Headpond	3/12/06	10.00	0
REL	JOR - Elliott Headpond	3/12/06	11.00	0
REL	JOR - Elliott Headpond	3/12/06	12.00	0
REL	JOR - Elliott Headpond	3/12/06	13.00	0
REL	JOR - Elliott Headpond	3/12/06	14.00	0
REL	JOR - Elliott Headpond	3/12/06	15.00	0
REL	JOR - Elliott Headpond	3/12/06	16.00	0
REL	JOR - Elliott Headpond	3/12/06	17.00	0
REL	JOR - Elliott Headpond	3/12/06	18.00	0
REL	JOR - Elliott Headpond	3/12/06	19.00	39.689
REL	JOR - Elliott Headpond	3/12/06	20.00	53.577
REL	JOR - Elliott Headpond	3/12/06	21.00	29.761
REL	JOR - Elliott Headpond	3/12/06	22.00	0
REL	JOR - Elliott Headpond	3/12/06	23.00	0
REL	JOR - Elliott Headpond	3/12/06	24.00	0
REL	JOR - Elliott Headpond	4/1/06	1/1/00	0
REL	JOR - Elliott Headpond	4/1/06	1/2/00	0
REL	JOR - Elliott Headpond	4/1/06	1/3/00	0
REL	JOR - Elliott Headpond	4/1/06	1/4/00	0
REL	JOR - Elliott Headpond	4/1/06	1/5/00	0
REL	JOR - Elliott Headpond	4/1/06	1/6/00	0
REL	JOR - Elliott Headpond	4/1/06	1/7/00	0
REL	JOR - Elliott Headpond	4/1/06	1/8/00	0
REL	JOR - Elliott Headpond	4/1/06	1/9/00	0
REL	JOR - Elliott Headpond	4/1/06	1/10/00	0
REL	JOR - Elliott Headpond	4/1/06	1/11/00	0
REL	JOR - Elliott Headpond	4/1/06	1/12/00	0
REL	JOR - Elliott Headpond	4/1/06	1/13/00	0
REL	JOR - Elliott Headpond	4/1/06	1/14/00	0

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REL	JOR - Elliott Headpond	4/1/06 1/15/00	0
REL	JOR - Elliott Headpond	4/1/06 1/16/00	0
REL	JOR - Elliott Headpond	4/1/06 1/17/00	0
REL	JOR - Elliott Headpond	4/1/06 1/18/00	0
REL	JOR - Elliott Headpond	4/1/06 1/19/00	0
REL	JOR - Elliott Headpond	4/1/06 1/20/00	0
REL	JOR - Elliott Headpond	4/1/06 1/21/00	0
REL	JOR - Elliott Headpond	4/1/06 1/22/00	0
REL	JOR - Elliott Headpond	4/1/06 1/23/00	0
REL	JOR - Elliott Headpond	4/1/06 1/24/00	0

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**Appendix C - Tidal Data**

Tides for the survey periods March 11, 12 and April 1 2006 at the Fisheries and Oceans Canada Port Renfrew Tide Station

**Port Renfrew (Station #8525)**

<b>2006-03-11 (Saturday)</b>		
<b>Time</b>	<b>Height</b>	
<b>PST</b>	<b>(m)</b>	<b>(ft)</b>
04:08	<b>1.9</b>	6.2
10:04	<b>2.9</b>	9.5
17:21	<b>0.9</b>	3.0
23:56	<b>2.5</b>	8.2

<b>2006-03-12 (Sunday)</b>		
<b>Time</b>	<b>Height</b>	
<b>PST</b>	<b>(m)</b>	<b>(ft)</b>
04:55	<b>1.8</b>	5.9
10:50	<b>2.9</b>	9.5
17:51	<b>0.9</b>	3.0

<b>2006-04-01 (Saturday)</b>		
<b>Time</b>	<b>Height</b>	
<b>PST</b>	<b>(m)</b>	<b>(ft)</b>
01:53	<b>3.4</b>	11.2
09:02	<b>0.5</b>	1.6
15:12	<b>2.5</b>	8.2
20:08	<b>1.5</b>	4.9

## Appendix D – Weather Conditions

Date	Time	Wind Direction	Wind Speed (Km/Hr)	Temp Air (Degrees Centigrade)	Estimated Wave Height (Feet)			
					Shakies	Outside River Mouth	Points Left	Points Right
March 11	09:48	NW	10-15	13	3-4	0	3-4	3-4
	10:56	NNW	4	14	3	4	4	4
	12:00	NNE	12	17	2	3	2	2
	13:00	NNE	8	15	0	2-3	1-2	1-2
	14:00	NNE	0-4	19	1-2	1-2	1-2	1-2
March 12	09:49	E	10	11	0.5	0	0.5	0.5
	11:00	E	12	11	1-2	1	0.5	0.5
	12:00	E	13	11	1-2	0.5	0.5	0.5
	13:00	E-NE	10	11	1	0.5	0.5	0.5
	14:00	E-NE	8	11	1	0.5	0.5	0.5
March 25	10:00	SW	7	9	0.5 - 1	0	0.5	0.5
	11:00	SW	13	6	0.5	0	0.5	0.5
	12:00	SW	13	8	0.5	0	0	0
April 1	10:05	SW	0-4	15	1	0	0	0
	10:35	SW	0-4	14	2	0	2	3
	11:05	SW	5-6	16	1	0	2	2
	11:35	SW	6-7	12	2	1	2	3
	12:05	SW	6	13	1	0	2	2
	12:50	SW	9-12	13	2	3	2	1
	13:25	SW	7-8	10	2	1	1	2
	14:00	SW	0-5	14	4	1	3	3
	14:40	SW	0-5	16	2	1	3	3
15:10	SE	7-9	14	2	0	3	4	