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Ex. 277-US-422

R. Nawa  
*Oregon Department of Fish and Wildlife*

C. Huntington  
*Oregon Department of Fish and Wildlife*

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Stream: Williamson River  
Tributary to: Upper Klamath Lake  
Survey Type: ODFW Stream Habitat  
Access: Canoe  
Reach: 2 (Units 9-26)  
Start: T35S-R07-S21NE  
Quad: Agency Lake, Chiloquin  
Dates Surveyed: 4-5 August 04  
Surveyors: R. Nawa, K. Hartzell  
Report: R. Nawa, C. Huntington  
Distance Surveyed: 6.5 km

#### Reach Description

Highway 97 bridge to Sprague River.

#### Land Use

Primary land use is rural residential and cattle pasture.

#### Valley and stream channel geometry

The 0.05 percent gradient river was in a valley over 1 km wide. Sinuosity was low (1.2). Low terraces sloped abruptly to form narrow floodplains adjacent to the 53 m wide river.

#### Substrate

The streambed was very fine textured. An estimated 45 percent of the streambed was in sand and organics, gravel 8 percent, cobble 23 percent, and bedrock 9 percent. Exposed bedrock suggests that alluvium forms a relatively thin layer of substrate that is vulnerable to being lost with scour. Scoured riffles were most apparent below the county boat launch.

#### Spawning Gravel

Spawning gravel was concentrated in riffles. Large patches of suitable spawning gravel were found adjacent to mid-channel bars (islands). Accumulations of gravel/cobble  $>1000 \text{ m}^2$  suitable for Chinook salmon spawning were mapped (see Map). Surveyors visually estimated  $4,000 \text{ m}^2$  of gravel/cobble at a riffle above the Highway 97 bridge (U9). Similarly,  $3,900 \text{ m}^2$  of gravel/cobble was at U13,  $2,100 \text{ m}^2$  at U15, U17, U18 and  $1,260 \text{ m}^2$  at U22. Surveyors estimated a total of  $12,837 \text{ m}^2$  of gravel/cobble were suitable for spawning at existing low flows ( $1,982 \text{ m}^2 / \text{km}$ ). An additional  $656 \text{ m}^2$  would be available at high flows.

Riffles were 40 percent cobble, 17 percent gravel and 20 percent bedrock. Riffles are depositional areas and would be expected to be 100 percent alluviated. However, about  $18,000 \text{ m}^2$  of riffle habitat is bedrock. Significant areas of exposed bedrock in riffles suggests that suitable spawning habitat has been lost due to scour to bedrock. For example, a riffle at Unit 20 is 20 percent bedrock. Unit 24 also appears to be losing alluvium while bedrock increases. High percents of cobble suggest that finer textured gravel is being removed leaving only coarse cobbles. Unusually deep pools in an alluviated system is also evidence that the river is scouring. Percent composition of sand, gravel, cobble, boulder and bedrock in riffles needs to be monitored quantitatively over time to establish trends for this

reach. An alternative hypothesis is that bedrock is decreasing, since pre-2004 substrate data is not available.

#### Riparian Vegetation

Patches of willows and alders border the river, but grass dominates the riparian zone. Apparently existing grass and willow cover is adequate to stabilize streambanks because only 2 percent of streambanks were eroding. Shade, which averaged 15 percent, is not a major factor for maintaining cool stream temperatures.

#### Wood

Wood debris (4 pieces/100m) was mostly sunken logs. These logs were presumably a product from temporary log storage for former saw mills. Very few (if any) trees from the riparian zone are falling into the channel. Scattered saw logs in the bottom of pools is not affecting channel morphology (i.e. wood is not storing sediment or causing local scour). A log jam found at the head of an island 300 m below the county boat launch appears to have been influential in the deposition of alluvium over bedrock. Units 20 and 21 adjacent to the island provide suitable spawning gravel. A log jam of 60+ pieces at unit 23 was a factor in the formation of a gravel bar.

#### Rearing and Adult holding Habitat

Due to very low stream gradient, much of the reach consisted of 5 long scour pools or glides (275m-2,154 m) separated by shorter low gradient riffles (86m-233 m). Maximum pool depths measured with a depth finder were incredibly deep and have the potential to hold large numbers of Chinook salmon adjacent to large patches suitable spawning gravel. The location of maximum depths ranging from 5.4m to 8.3 m were mapped for 3 pools (U10,U14,U21). Residual depths averaged (4.2 m).

#### Stream Temperature

Moderate flow from the Sprague River (21.5° C) increased the temperature of the Williamson River from 11.5° C (above Sprague) to 16.0° C (below Sprague).

Photo 31 Unit 15  
Riffle had an estimated  
1,500 m<sup>2</sup> of gravel/cobble  
suitable for Chinook  
salmon spawning.

Photo 33 Unit 20/21  
Embedded logs helped  
alluvium resist  
scouring and  
contributed to the  
formation of mid-  
channel bars (islands).

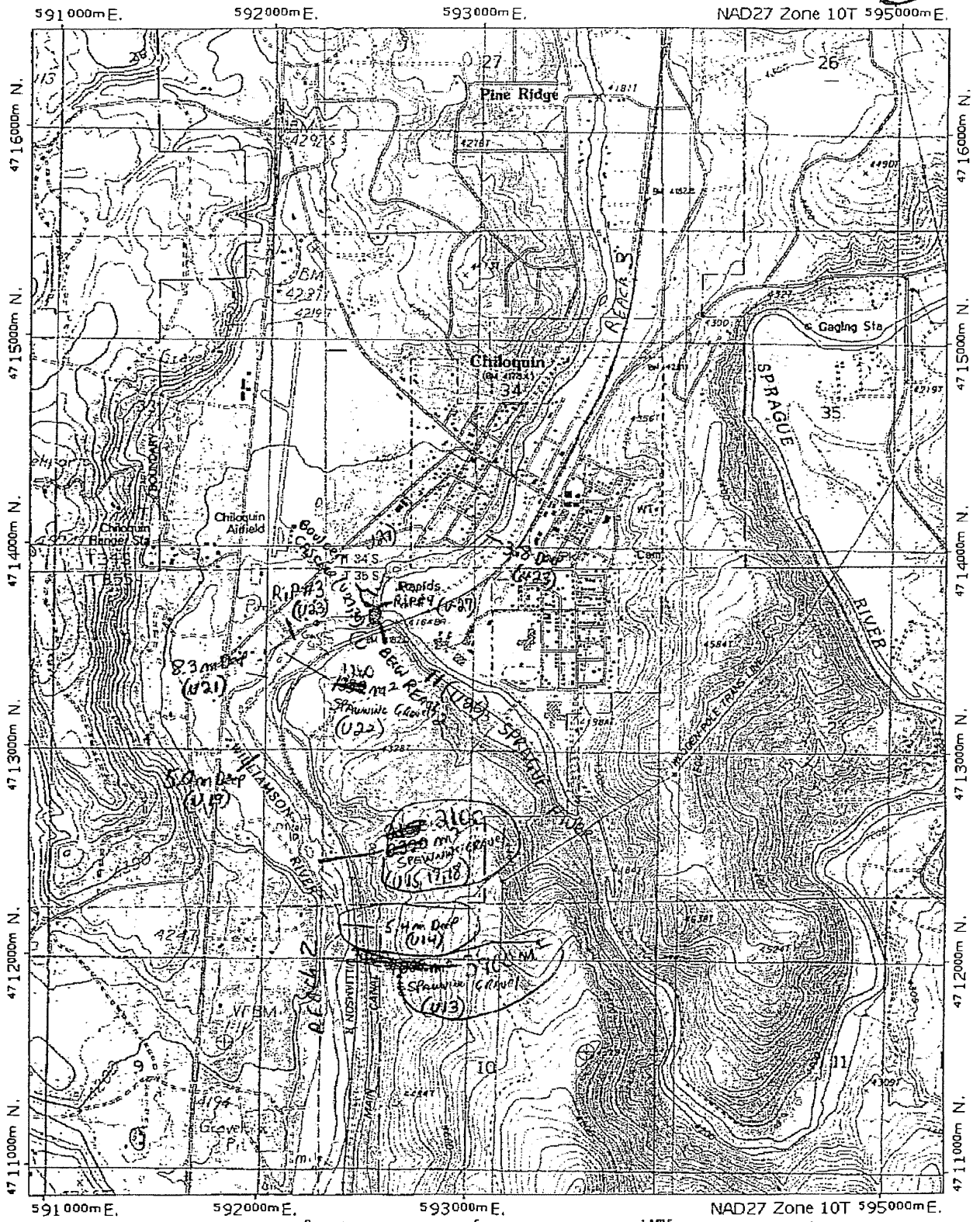
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0 5 1 MILE  
 0 1000 FEET 0 500 1000 METERS  
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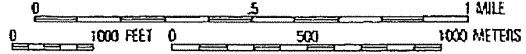
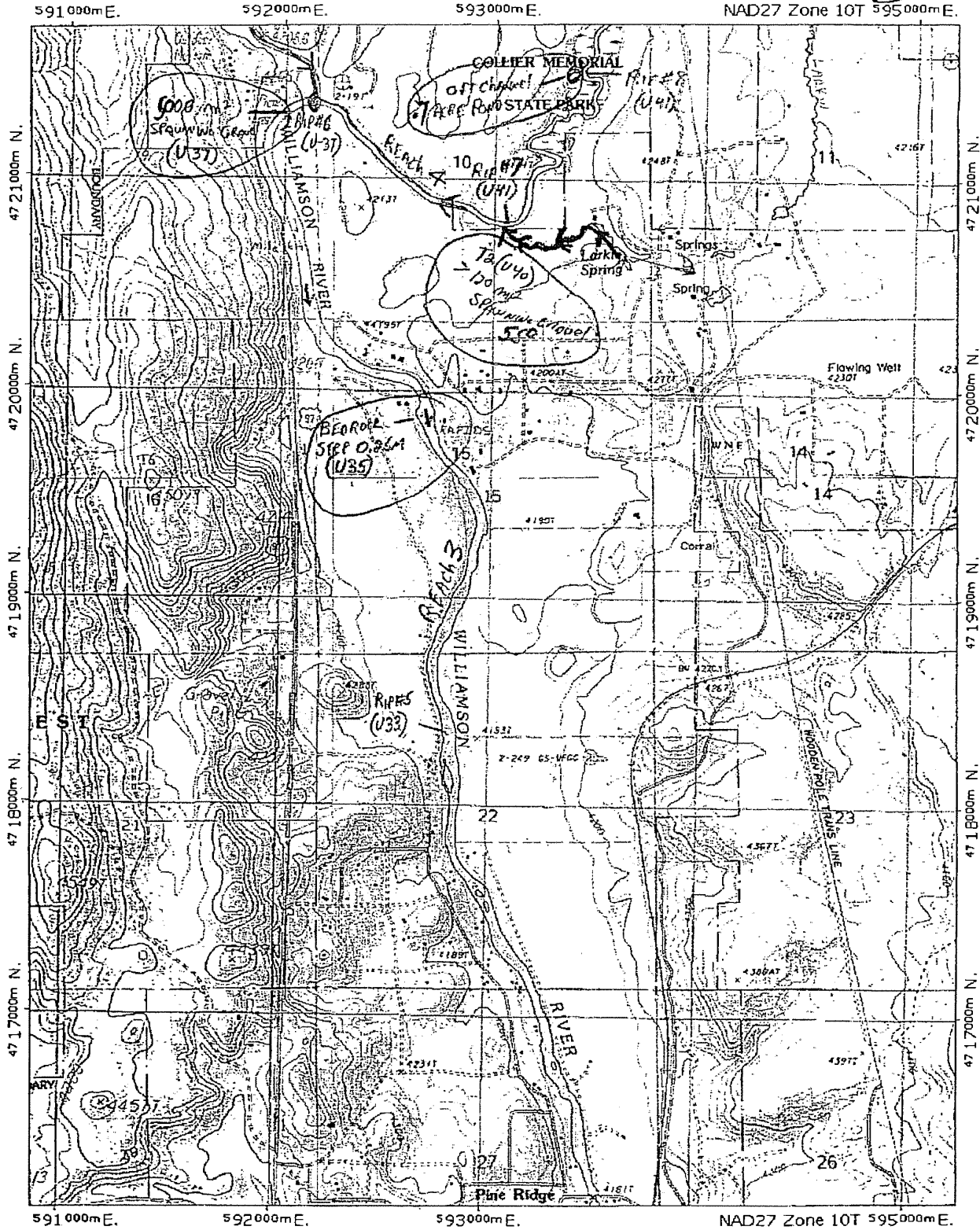
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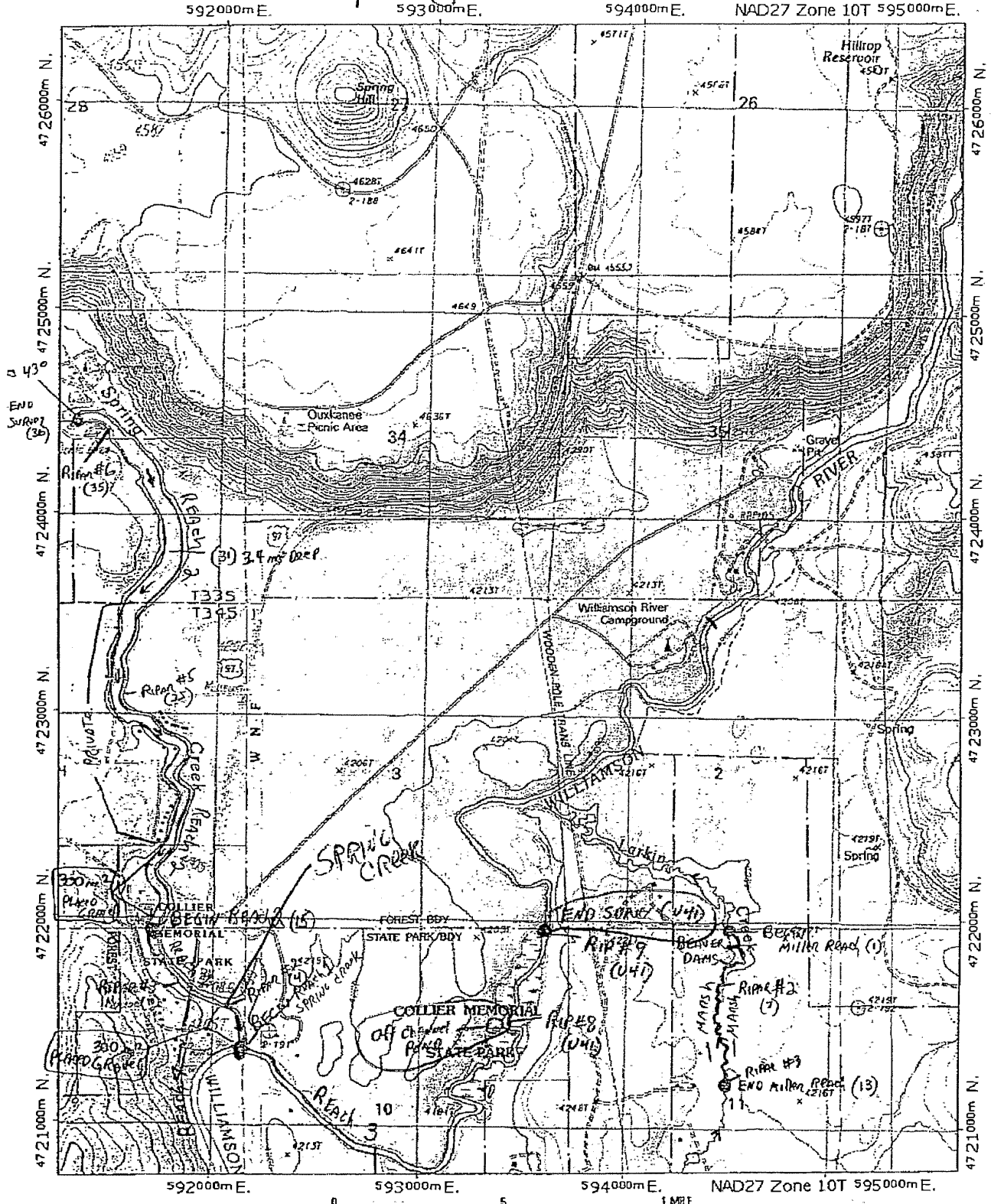
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# Spring Creek

5/6

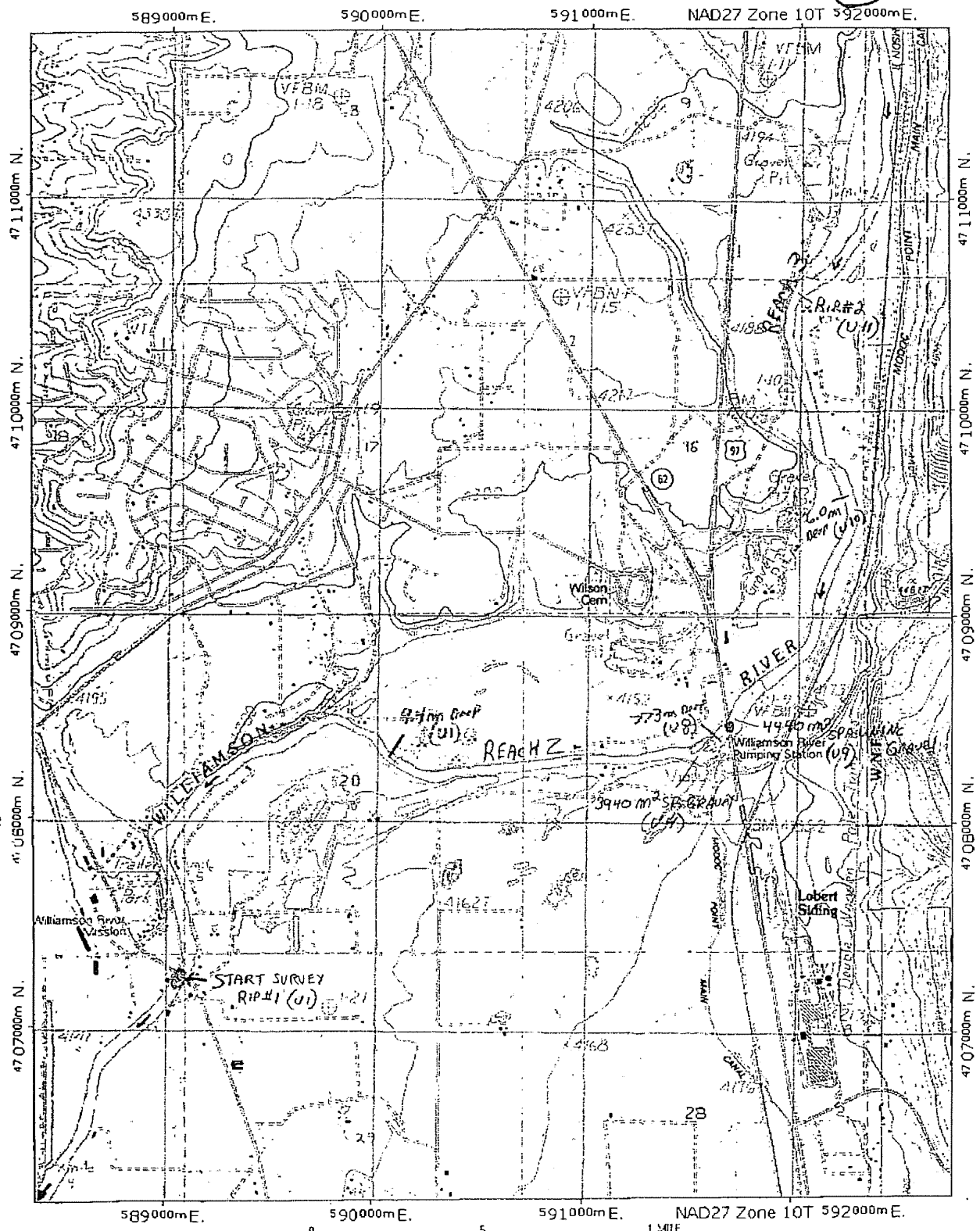


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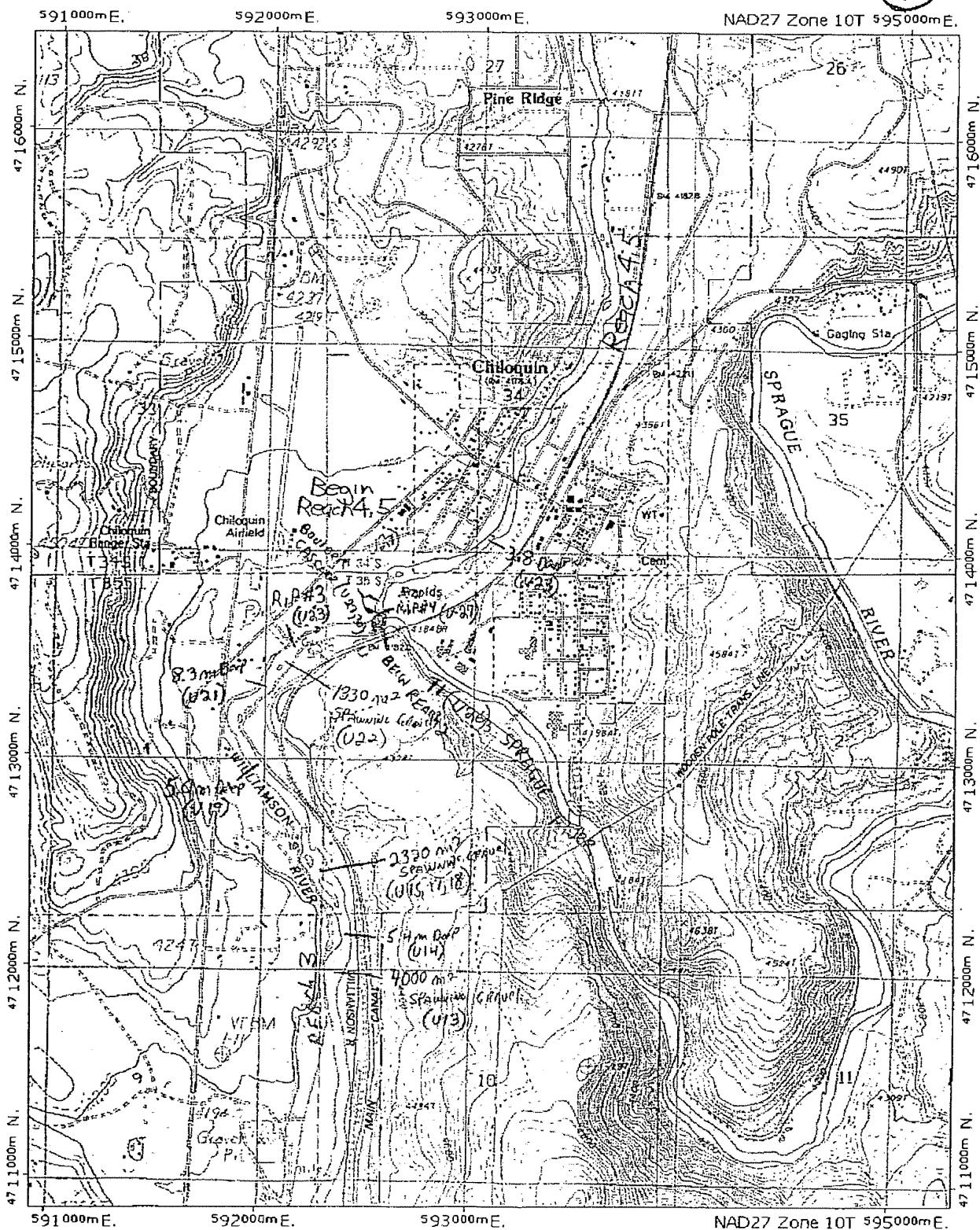
# Williamson River

2/6



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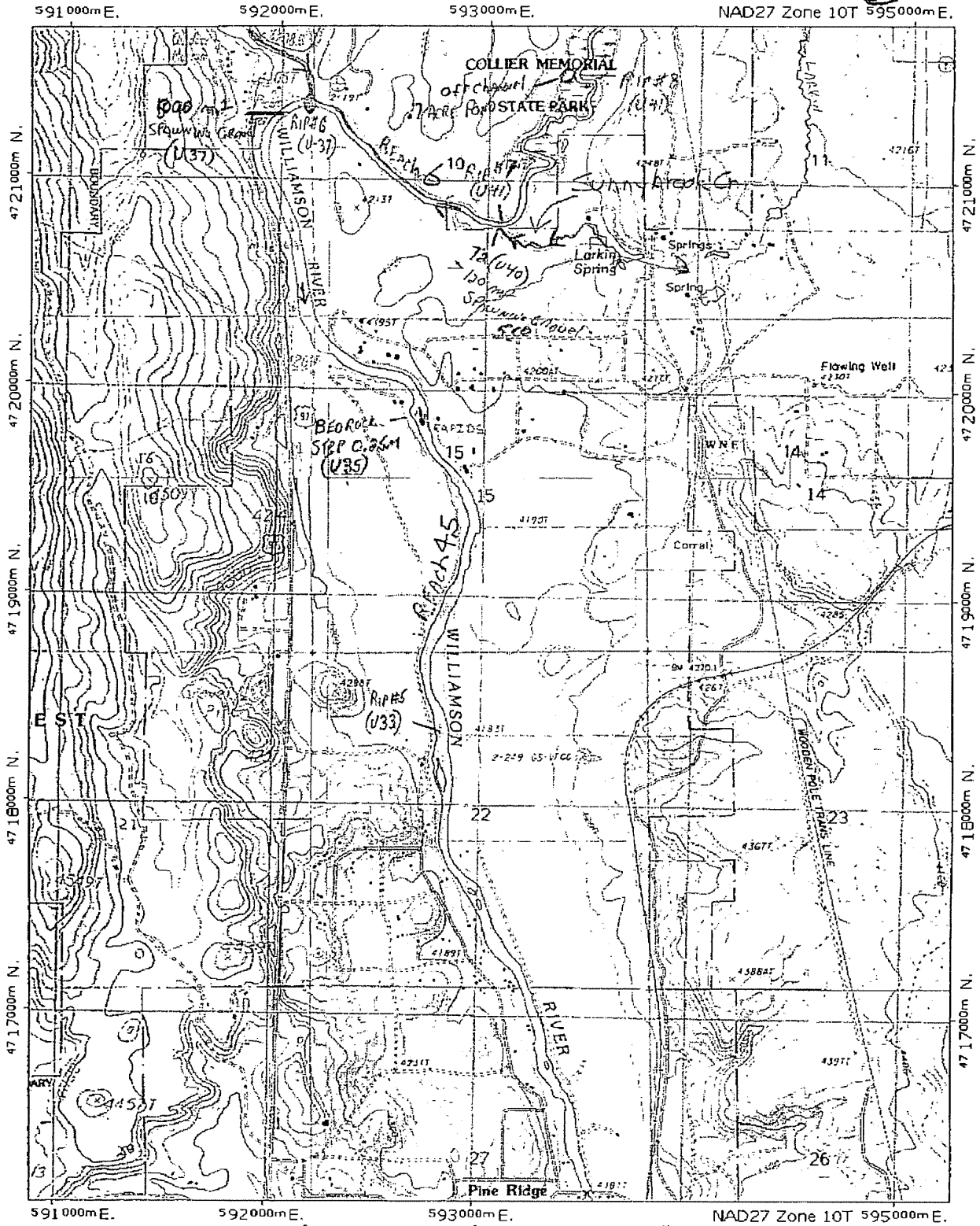
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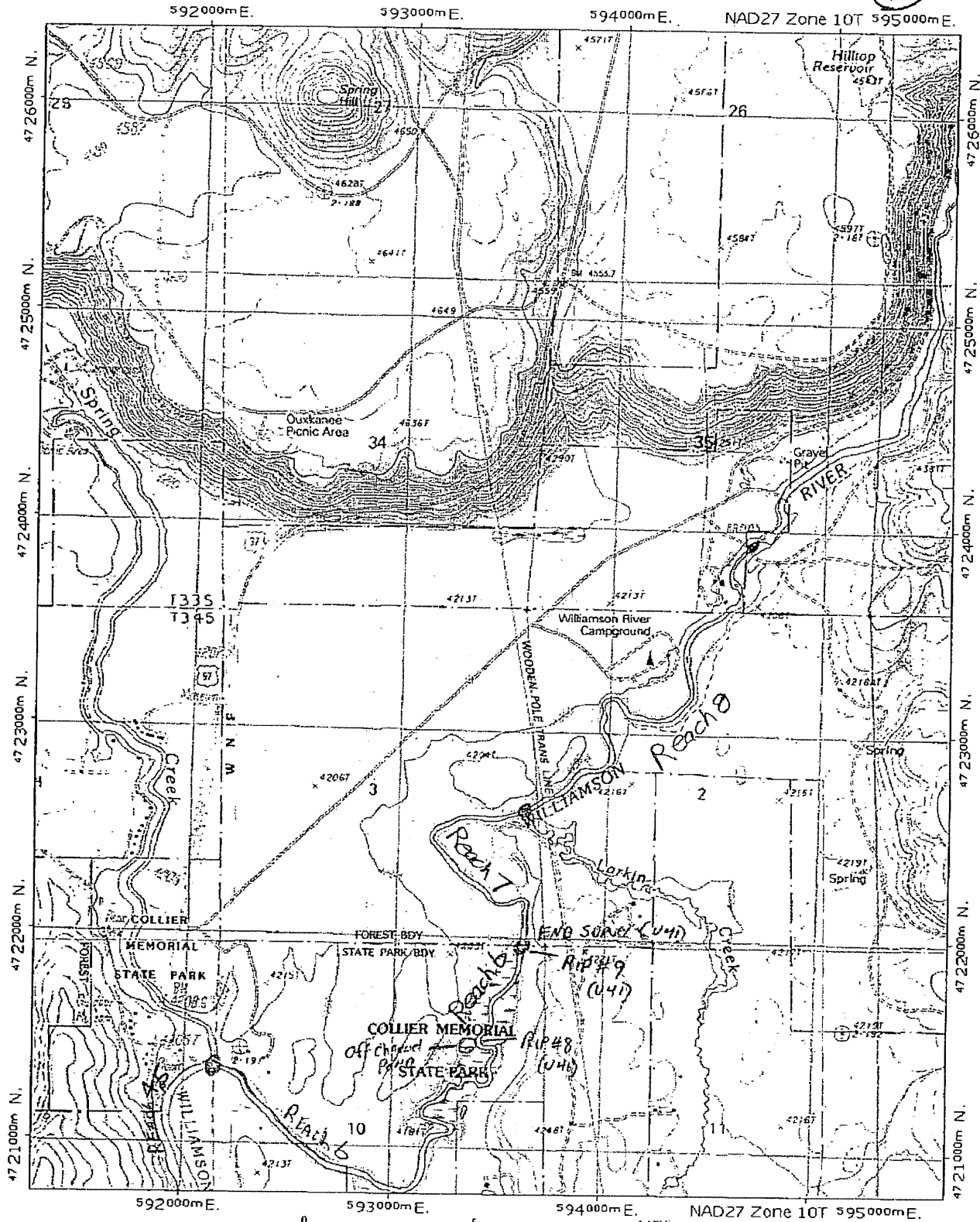
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4/6



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