

**Basin Management Objective
Butte County
Sub-Inventory Unit – RICHVALE**

Butte County Water Advisory Committee Member – Gene Harris

Contact Information

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Description of the Richvale Sub-Inventory Unit –

The Richvale Sub-Inventory Unit (SIU) covers an area of about 39,400 acres. It is bordered by the Western Canal SIU to the north, Biggs/West Gridley SIU to the south, Thermalito Sub-inventory Unit to the east and Butte Creek to the west. The Richvale SIU corresponds roughly to the service area of the Richvale Irrigation District. Normal-year agricultural production in the sub-inventory unit consists primarily of rice production supported almost solely by surface water. In drought years, about 17% of the Richvale SIU consists of summer agricultural production supported by groundwater.

Management Objective –

To maintain the groundwater surface elevation during the peak summer irrigation season (July and August) in all aquifer systems at a level that will assure an adequate and affordable irrigation groundwater supply. It is the intent of this management objective to assure a sustainable agricultural supply of good quality water now and into the future, and to assure the water supply can be utilized without injuring groundwater quality or inducing land subsidence. The management objective is also to assure an adequate groundwater supply of adequate quality from the alluvial aquifer system for all domestic users in the sub-inventory unit.

Geologic Formations Identified In Sub-Inventory Unit –

Geologic formations in the Richvale SIU, from youngest (shallowest) to oldest (deepest), include:

- Basin Deposits
- Modesto Formation
- Riverbank Formation
- Sutter Formation
- Tuscan Unit C (Upper Tuscan)

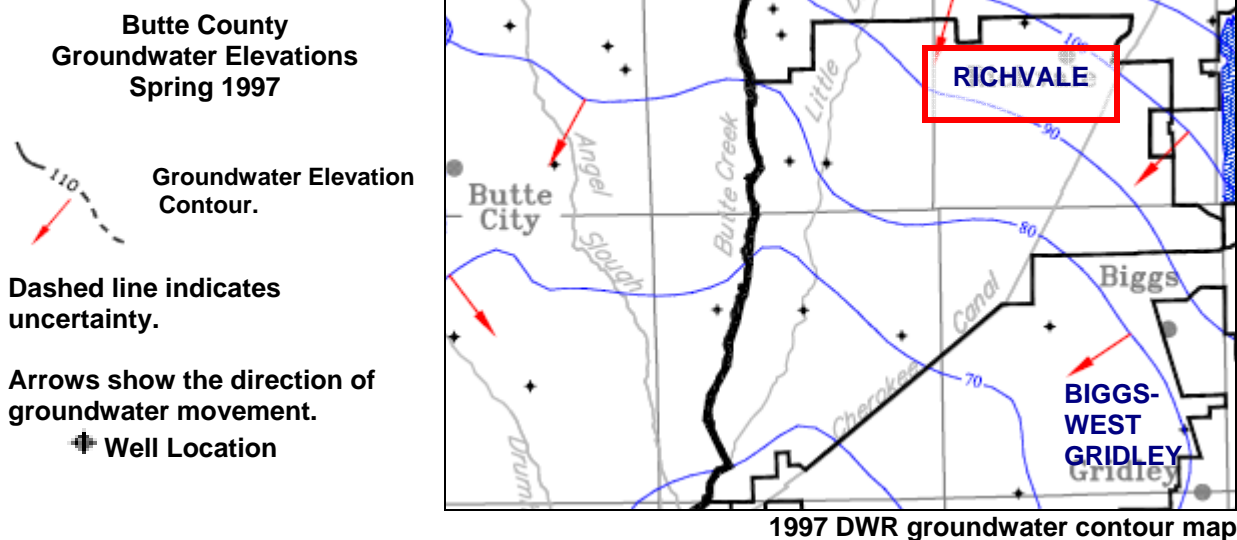
Fresh Water-bearing Units. In the Sacramento Valley Region of Butte County, fresh groundwater-bearing units include, from youngest (shallowest) to oldest

(deepest), the Modesto, Riverbank, Laguna, Tehama and Tuscan Formations. Those included in the Richvale SIU are:

- Modesto Formation
- Riverbank Formation
- Tuscan Unit C (Upper Tuscan)

Groundwater Flow in the Richvale Sub-Inventory Unit –

The below figure is a cropped segment of a map prepared by DWR Northern District. It shows the groundwater elevation contours in your sub-inventory unit with arrows indicating the direction of groundwater movement. This graphic indicates that the regional pattern of spring groundwater movement in the Richvale SIU is in a south-to-southwesterly direction, at a gradient of about 4 feet per mile, toward Butte Creek and the Sacramento River.



BMO Key Wells Selected for Groundwater Level Monitoring –

SPRING

Well ID	Aquifer System	Well Type	Spring Stage 1 & 2 Alerts Elev. (ft)	Spring Stage 3 Alerts Elev. (ft)
18N01E13A02M	Riverbank/Sutter	Irrigation	68.42	63.42
18N01E15D02M	Riverbank	Domestic	62.92	57.92
19N01E27Q01M	Upper Tuscan	Monitoring	77.29	72.29
19N01E35B01M	Basin Deposits	Monitoring	78.14	73.14
19N02E15N02M	Basin Deposits	Irrigation	96.06	91.06

FALL

Well ID	Aquifer System	Well Type	Fall Stage 1 & 2 Alerts Elev. (ft)	Fall Stage 3 Alerts Elev. (ft)
18N01E13A02M	Riverbank/Sutter	Irrigation	68.08	63.08
18N01E15D02M	Riverbank	Domestic	61.14	56.14
19N01E27Q01M	Upper Tuscan	Monitoring	75.06	70.06
19N01E35B01M	Basin Deposits	Monitoring	77.30	72.30
19N02E15N02M	Basin Deposits	Irrigation	94.81	89.81

BMO Key Wells Selected for Groundwater Quality Monitoring–

Stakeholders in the Richvale SIU will work with staff to locate additional wells, either irrigation or domestic, with sufficient historical construction information to include in the water quality monitoring network, and initiate data collection in August 2008.

BMO Key Well(s) Selected for Land Subsidence Monitoring–

State Well Number: 19N/01E-35B01M. Maximum annual inelastic land subsidence shall not exceed 0.01 feet per year.

BMO Alert Stage Definitions and Compliance Methodologies–

The Richvale Sub-Inventory Unit will use the following guidelines in the management of the groundwater resources. The groundwater level and land subsidence management objectives are intended to trigger predetermined voluntary Ground Water Management Actions, as defined in the accompanying cover report, to remedy declining ground water levels that are not recovering to compliance levels for each index well. The groundwater quality BMO management actions will be defined once appropriate wells are selected and monitoring begins in August of 2008.

Groundwater Levels – Specific Depth

Stage 1: The first year that spring groundwater levels fall five feet below the average spring groundwater level established for the well.

Stage 2: Stage 2 is reached if spring groundwater levels, for a second consecutive year, remain five feet below the average groundwater level established for the well.

Stage 3: Stage 3 is reached if the spring groundwater levels fall ten feet below the average spring groundwater level established for the well.

Groundwater Quality –

Appropriate water quality monitoring wells will be selected prior to the August 2008 monitoring period.

Land Subsidence –

Maximum annual inelastic land subsidence shall not exceed 0.01 feet per year.

Stage 1: is reached when the annual elastic subsidence exceeds the average annual elastic subsidence measured over the period of record of the extensometer.

Stage 2: is reached when the annual elastic subsidence exceeds the maximum recorded elastic subsidence over the period of record for the extensometer.

Stage 3: is when inelastic subsidence is detected. Inelastic subsidence shall be detected by comparing reading from the extensometer taken on March 1 of each year against previous March 1 measurements.

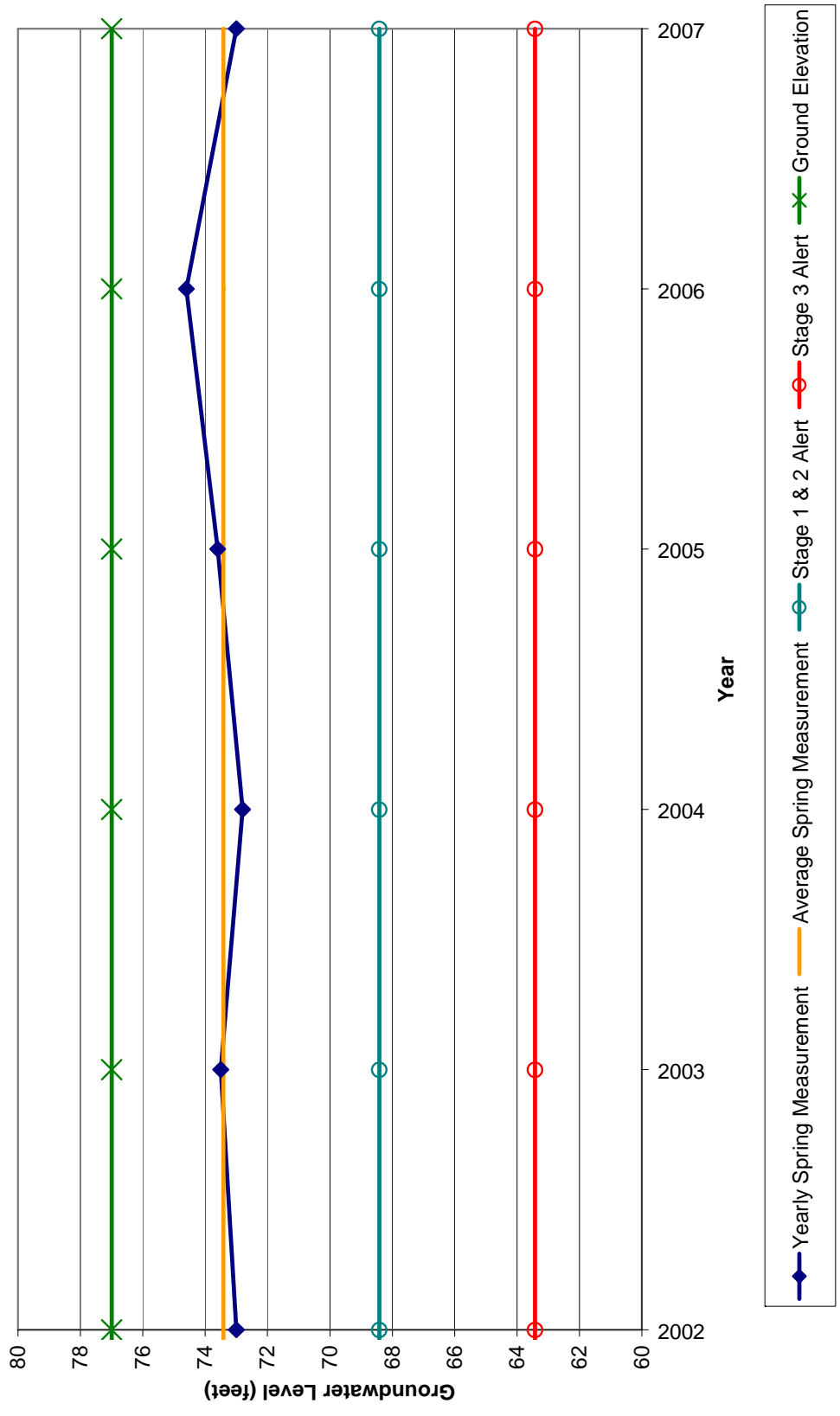
Future Monitoring Recommendations –

Efforts will be made to identify additional domestic wells that could be added to the existing monitoring well network in sub-inventory unit to allow development of management objectives for the alluvial aquifer system. Initiate data collection for development of groundwater quality management objective in 2009.

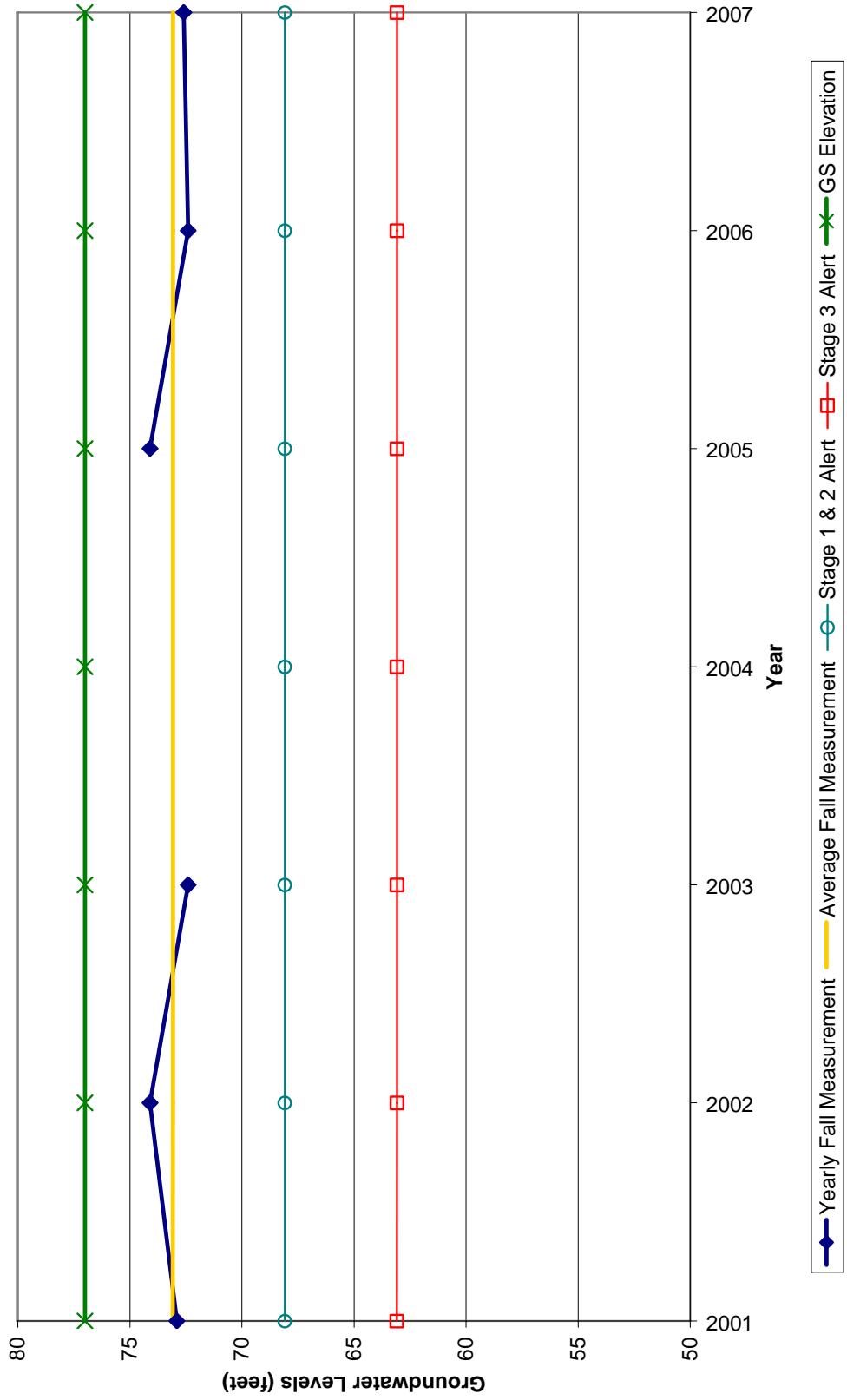
Supporting Data –

Hydrographs depicting yearly spring level measurements, including 2007 data, with established alert levels.

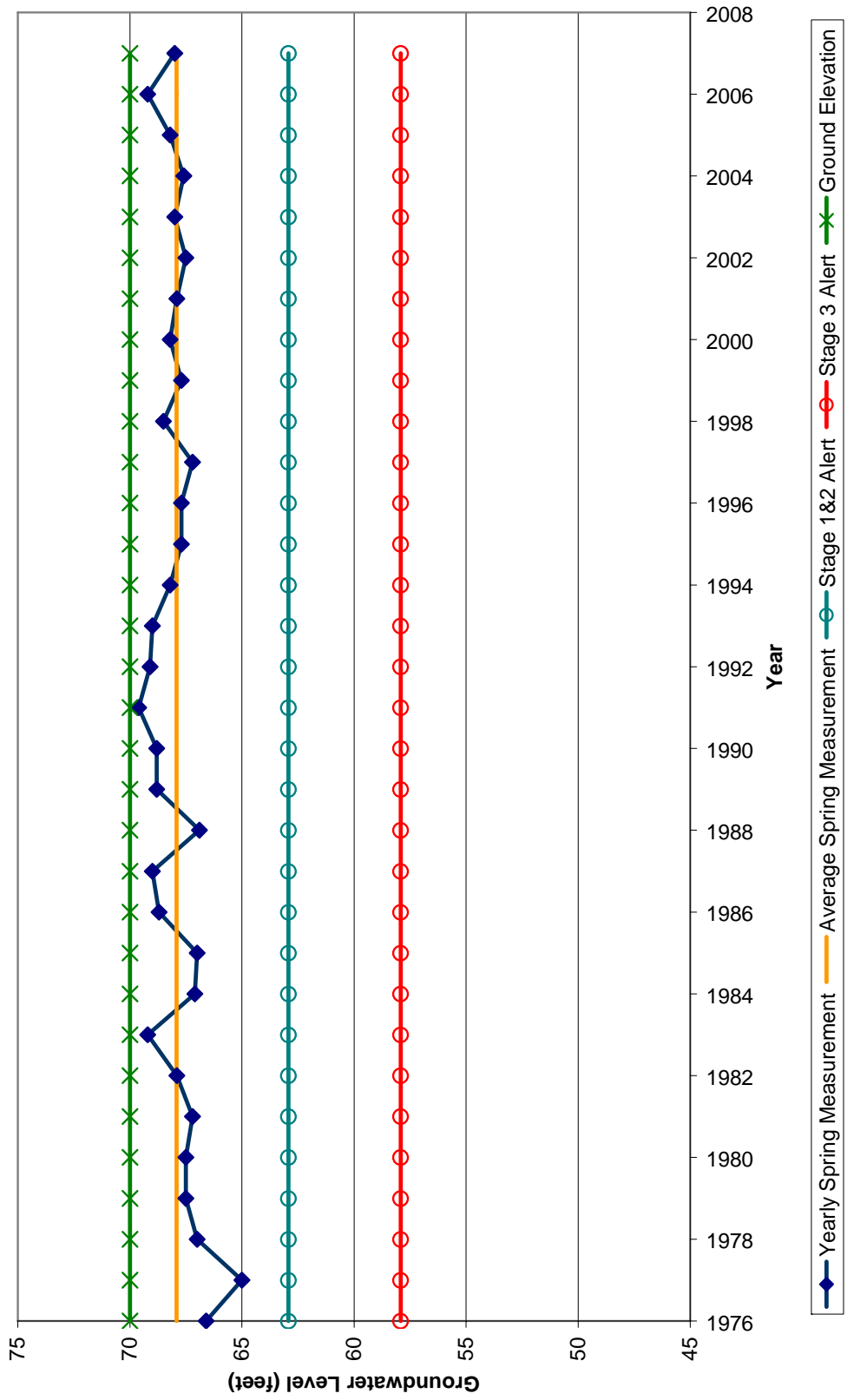
Spring Groundwater Levels
Richvale - 18N01E13A02



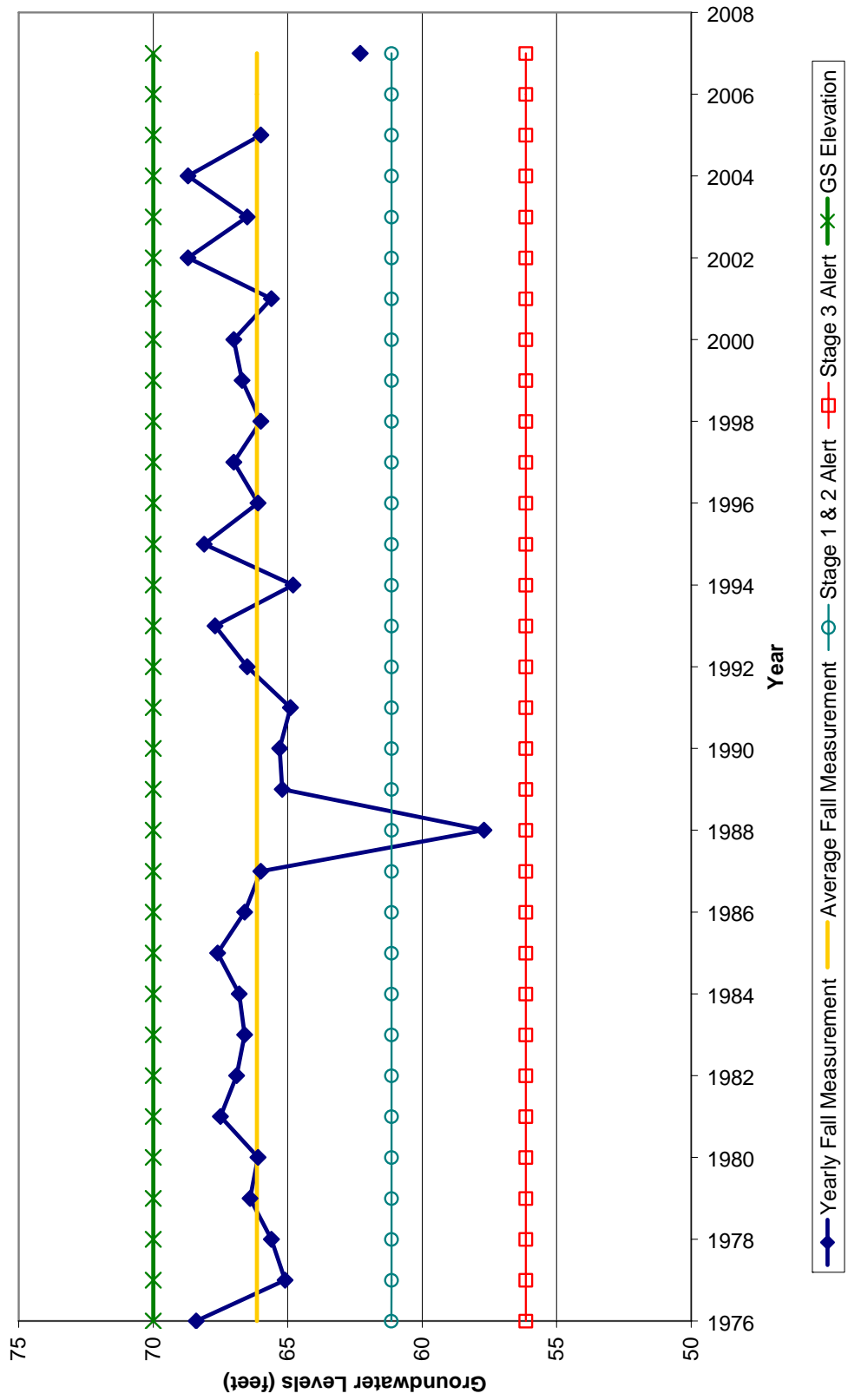
Fall Groundwater Levels
Richvale - 18N01E13A02



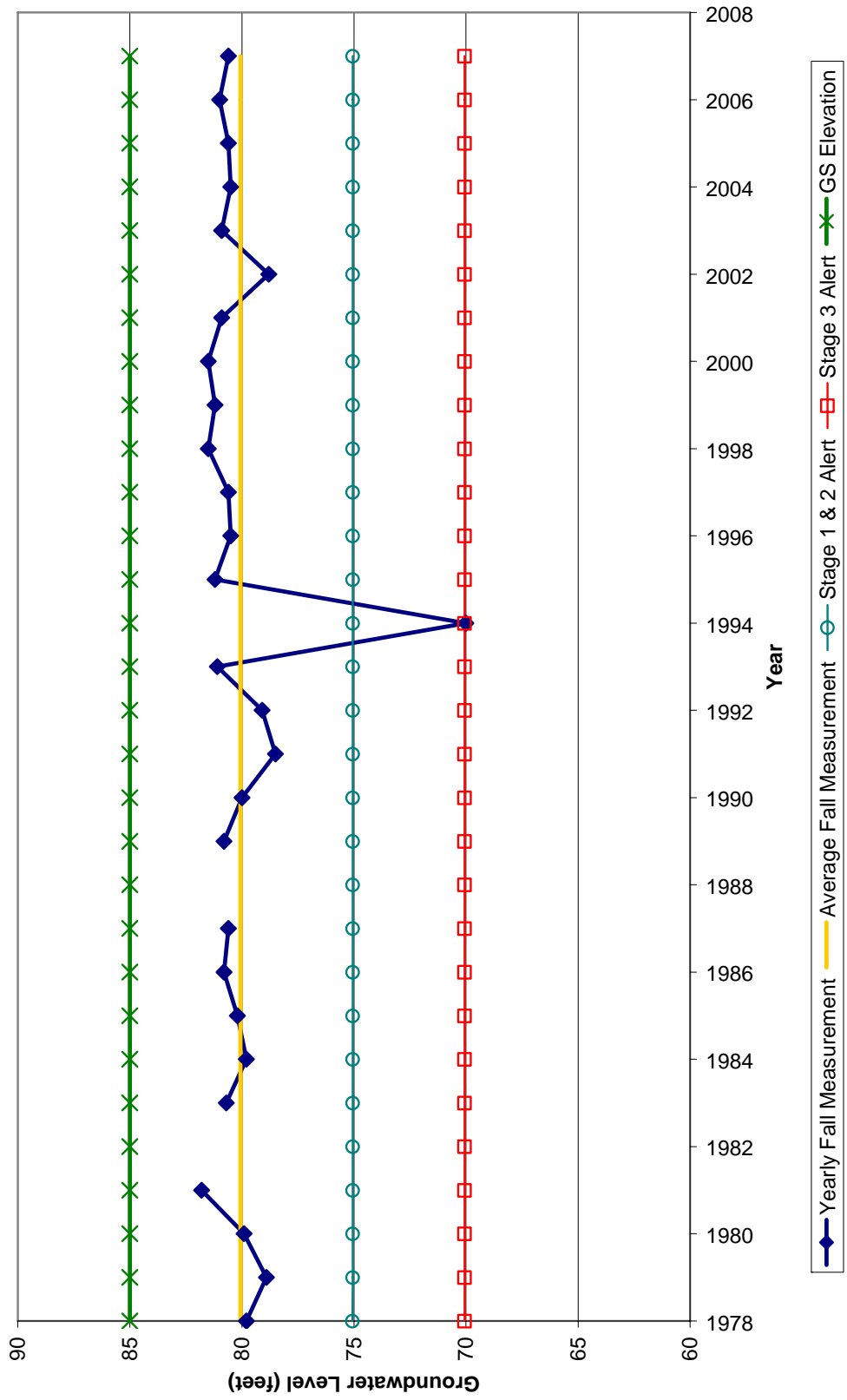
Spring Groundwater Levels
Richvale - 18N01E15D02



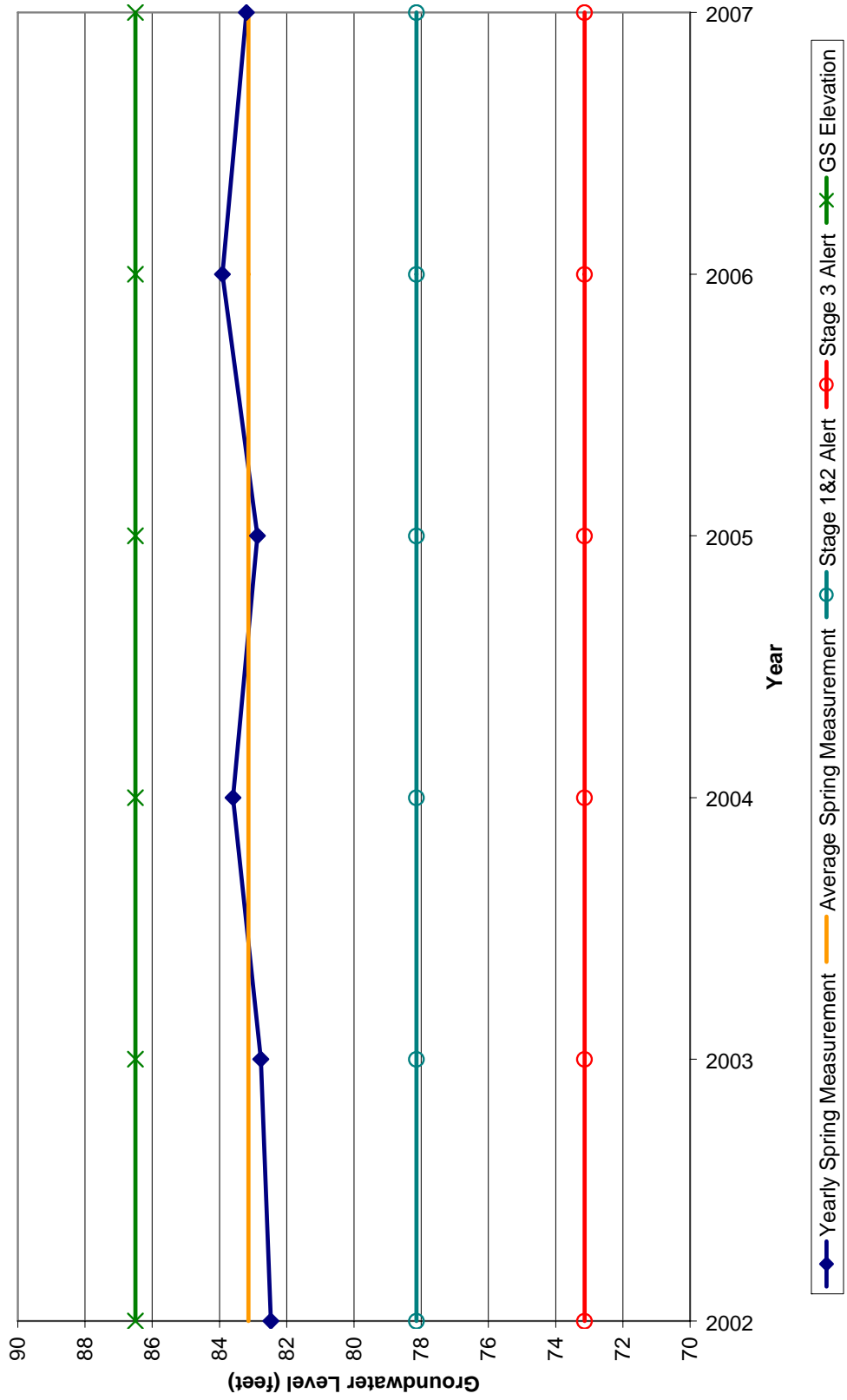
Fall Groundwater Levels
Richvale - 18N01E15D02



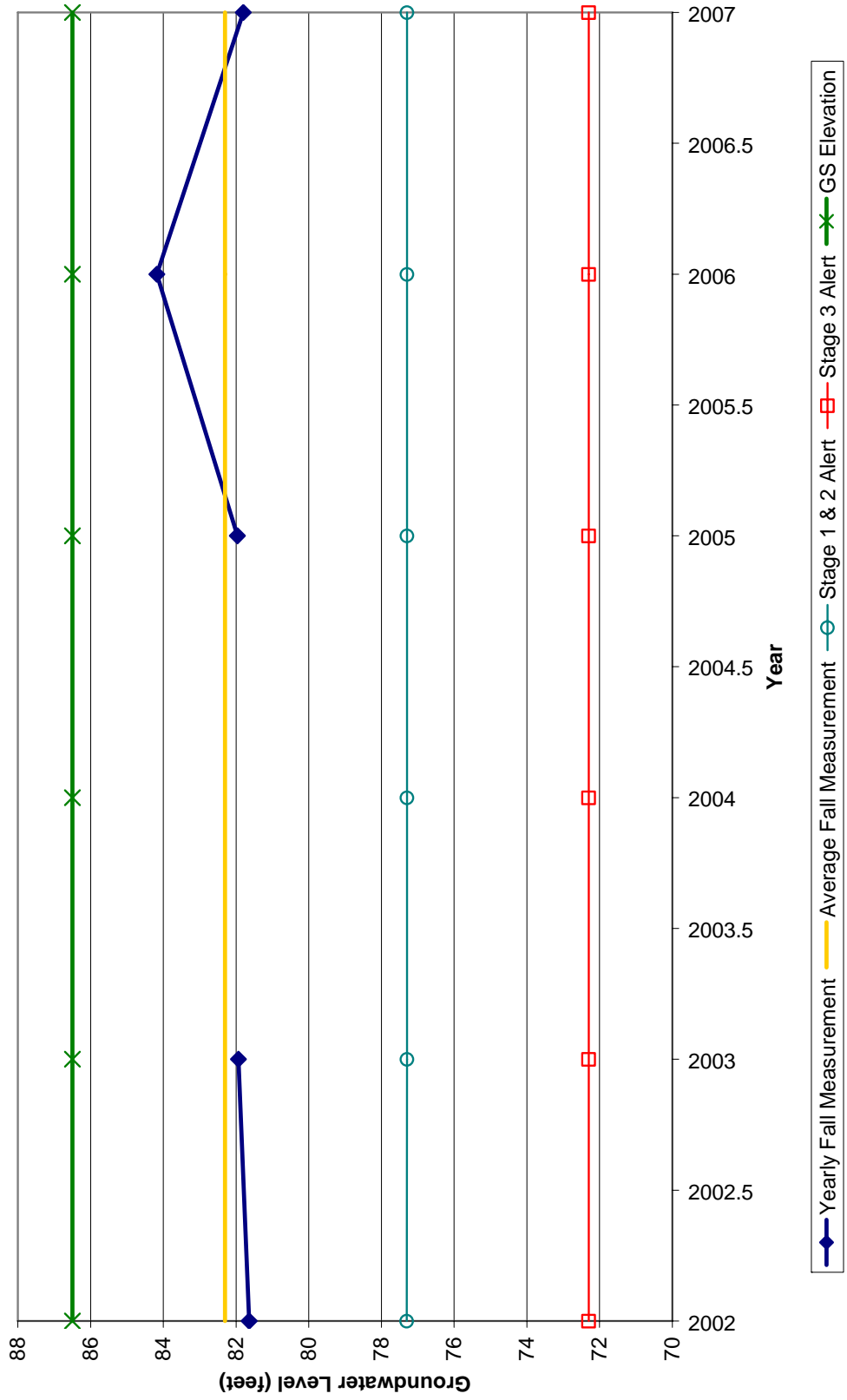
Fall Groundwater Levels
Richvale - 19N01E27Q01



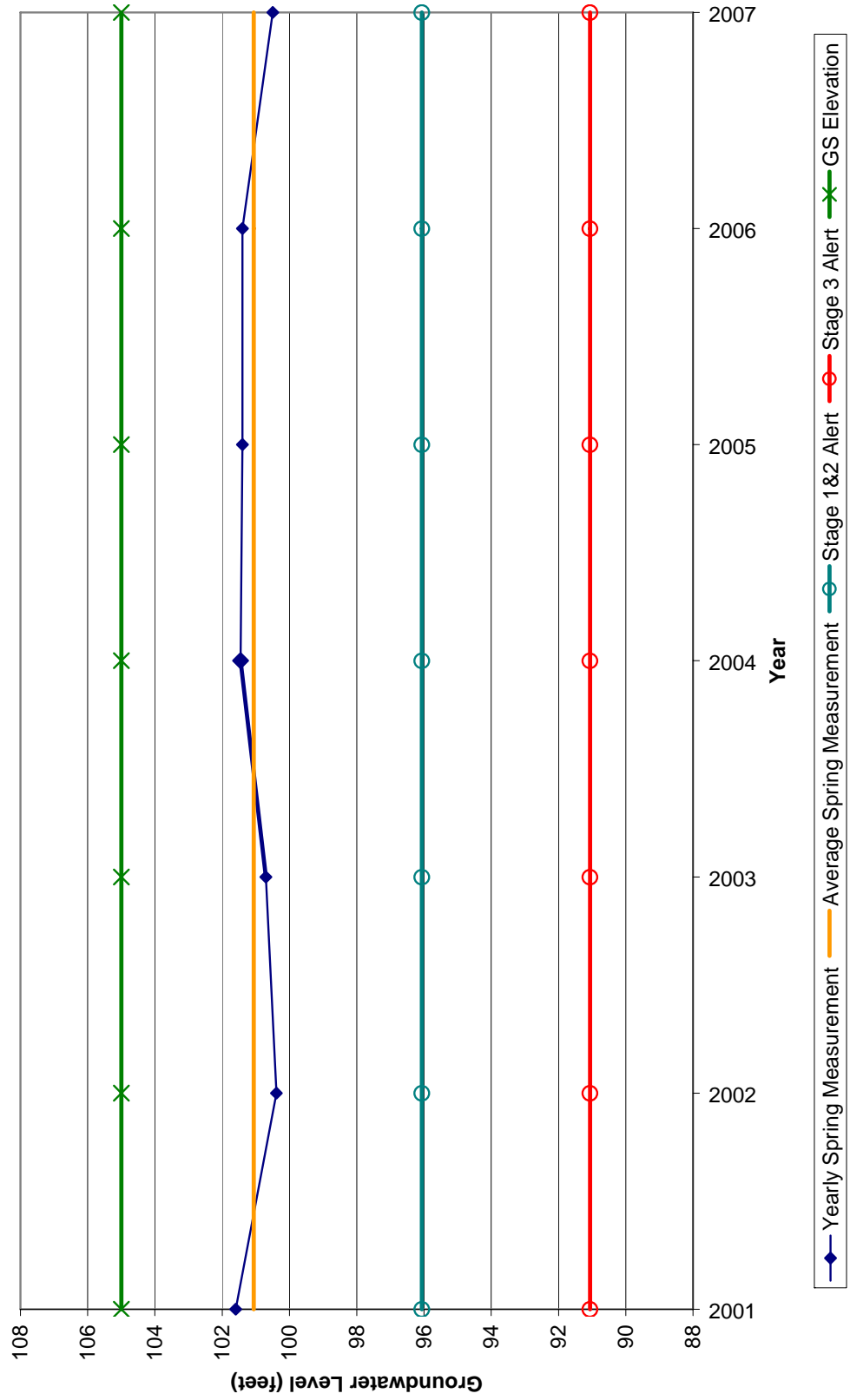
**Spring Groundwater Levels
Richvale - 19N01E35B01**



**Fall Groundwater Levels
Richvale - 19N01E35B01**



**Spring Groundwater Levels
Richvale - 19N02E15N02**



**Fall Groundwater Levels
Richvale - 19N02E15N02**

