SAN JUAN COUNTY
CONTROL NETWORK

PROJECT OVERVIEW: *To establish a **U**ser **D**ensification **N**etwork to facilitate current and future survey field work by establishing a consistent network of physical points that are the basis for controlling the horizontal and vertical positions of survey projects.*
To document, record and make available to the general public these findings in a detailed coordinate data base.

***PROJECT AREA*:** When this project was started the only control in the county was that of the National Spatial Reference System (NSRS), so it was necessary to first establish a User Densification Network (UDN). It was decided that due to the size of the county and the size of our office and staff that this would be done in phases, covering for the most part, only those areas of the county where the populous is. This control network amounted to what we call the 191 corridor, a stretch of the county that follows U.S. highway 191 and goes from Spanish Valley (Moab) in the north to Monument Valley (Arizona state line) in the south and everything east to the Colorado state line. The remaining area in the western part of the county will eventually be tied in, but is not of high priority at this time. A total of five UDN's have been established thus far, two in 2003 (La Sal and Monticello), two in 2004 (Spanish Valley and Blanding) and one in 2005 (Bluff). All of the networks overlap by using common monuments tied to the NSRS, either vertical or horizontal or both. Because we were familiar with the constraints of our GPS equipment, mainly radio link in extreme topography, we tried to keep each UDN station within five to seven miles of each other in order to minimize radio communication problems when using the network.

PROJECT CONTROL: The coordinates for the monuments in the **S**an **J**uan **C**ounty **U**ser **D**ensification **N**etwork **(UDN)** were established using **G**lobal **P**ositioning **S**ystem **(GPS)** static survey methods.
All primary control was part of the **N**ational **S**patial **R**eference **S**ystem **(NSRS)** and were either **1st or 2nd** order vertical benchmarks and **A or B** order horizontal stations. A fully constrained horizontal and vertical least squares adjustment was performed in order to obtain the vertical and horizontal control coordinates. Although the **UDN's** were not submitted for inclusion in the **N**ational **G**eodetic **S**urvey **(NGS)** Data Base (Blue Booked), this secondary control is comparable to **GPS Order B** standards.
The **U**tah **R**eference **N**etwork is a system consisting of a distributed network of state-wide reference stations communicating with a control center to calculate GNSS error corrections over a wide area. Real-time correction data is transmitted by radio or cellular modem to the rover receiver within the network area.

COORDINATE & MEASUREMENT UNITS: The Horizontal Control Datum is the **N**orth **A**merican **D**atum of 1983 **(NAD 83)** and the Vertical Control Datum is the **N**orth **A**merican **V**ertical Datum of 1988 (**NAVD 88).**
Coordinates are available in various formats but are kept on record as State Plane Coordinates, **Utah Coordinate System of 1983, Zone 4303, Utah South.** Coordinate and measurement units are in **U.S. Survey Feet** but are available in meters for publication as required by *Utah Code 57-10*.

MONUMENT DETAILS: Presently the San Juan County **UDN** consists of 49 **NSRS** monuments, 51 monuments set by the San Juan County Survey Office and 5 monuments set by other agencies. All control network monuments are either aluminum or brass caps set in concrete or drilled into bedrock.