The Stanley Hotel

History:
The property of the Stanley hotel was a favorite of Mr. Windham Thomas Whydham-Quin the fourth Earl of Dunraven. He would come to the area for his summer hunting.
“Lord Dunraven” wanted to put a Hunting lodge and game preserve.

Wyndham Thomas Quinn the 4th Earl of Dunraven

Dunraven hired some local Agents and purchased 15,000 acres from the U.S. Government. Soon after the purchase there were claims filed by twenty-one different parties including Mr. R.Q. McGregor. They all claimed that Dunraven had no right to the land because he was not a U.S. citizen. Mr. Dunraven lost the property due to the claims of Mr. McGregor.

F.O. Stanley

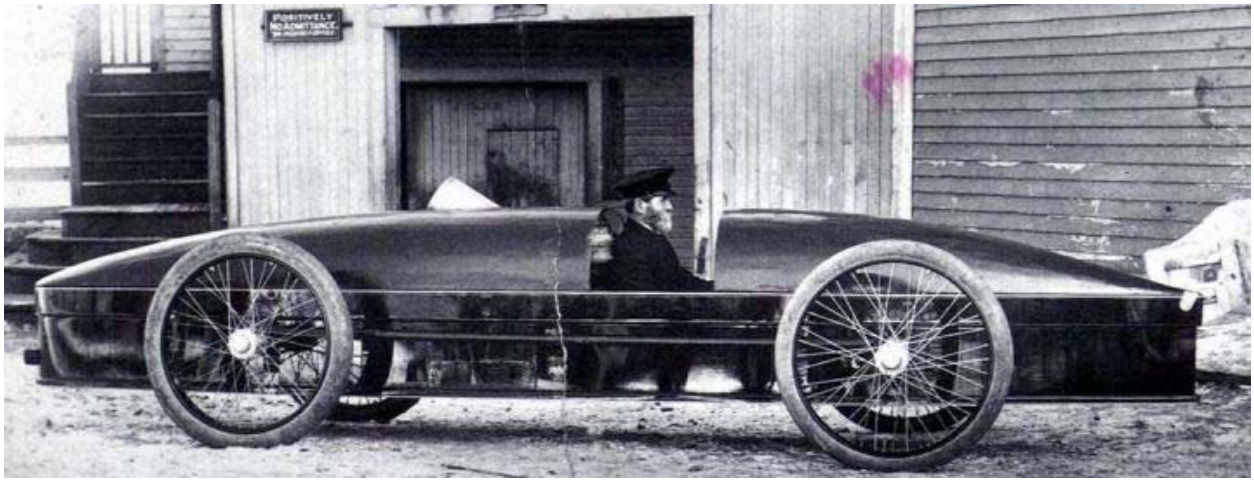
A local who wanted to purchase the land for himself had hired R.Q. McGregor. This was Mr. Freelan Oscar Stanley.

Freelan Oscar (F.O.) Stanley was born in 1849; he was diagnosed with tuberculosis in 1903 and was told to move to Colorado because the "fresh mountain air" would help his condition. Mr. Stanley and his wife moved to a home located at 1401 Gilpin St in Denver. After a month in Denver, he was showing no signs of change. Arrangements were made for him to visit a friend's cabin in Estes Park. Mr. & Mrs. Stanley fell in love with the area and in 1904 purchased 8.4 acres of their own.

F.O. Stanley's sister

Flora Jane Record Tileston, who would become Mrs. Stanley (1848-1949) was an active member of the community, she was known for dressing up as a Gypsy and doing fortune telling at fundraisers for the Estes Park Women's Club

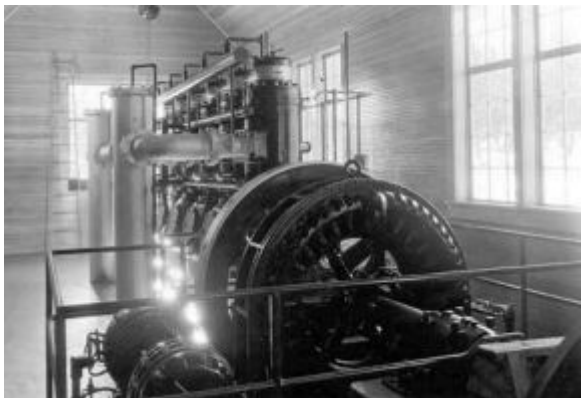
They purchased the property with the assistance of Mr. R.Q. McGovern and had headed the movement to grab the land from “Lord Dunraven.”



A Stanley Steamer

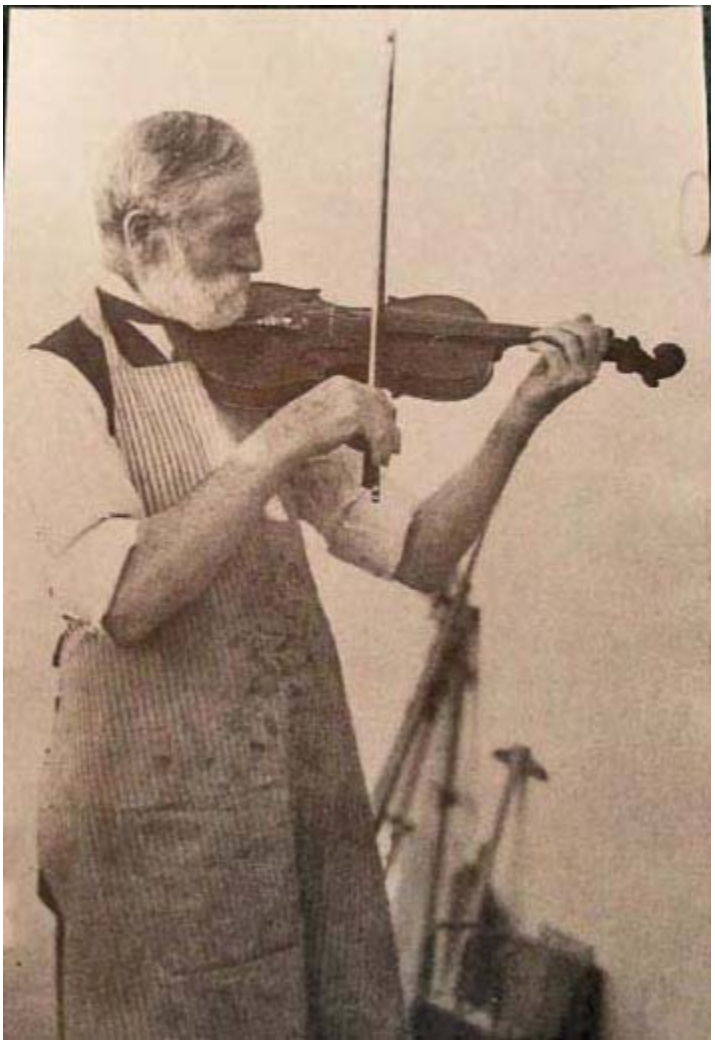
Mr. Stanley was co-owner of the Stanley Steamer Motor Company. His brother (Francis Edgar Stanley) and F.O. had patented the Steam powered car and they were mass-producing them. The first steamer was built for the Stanley’s, however interest grew because in 1898 one of the cars won the hill climbing contest at Charles River Park, and a Steamer that was driven by F.O. with his wife as a passenger was the first car to climb Mount Washington.
Some of the records held by the Stanley Steamer:
1899 – First car to climb Mount Washington

- 1899 – First car to be ridden by a U.S. President (McKinley). F.O. drove the car.
- 1903 – World one-mile track speed record
- 1906 – World one mile, five miles and one kilometer speed records
- 1906 – Broke the two miles in one-minute barrier
- 1906 – World land speed record at 127.659 mph



Inside the Hydro-Power Plant

The initial orders for the car exceeded 200 requests. One of the main advantages to the Steamer was the start time (the average start time for a Steamer was 20 minutes), however when electronic ignitions became available this was no longer an issue. Production of the Stanley Steamer lasted over 25 years, with approximately 10,500 cars produced.

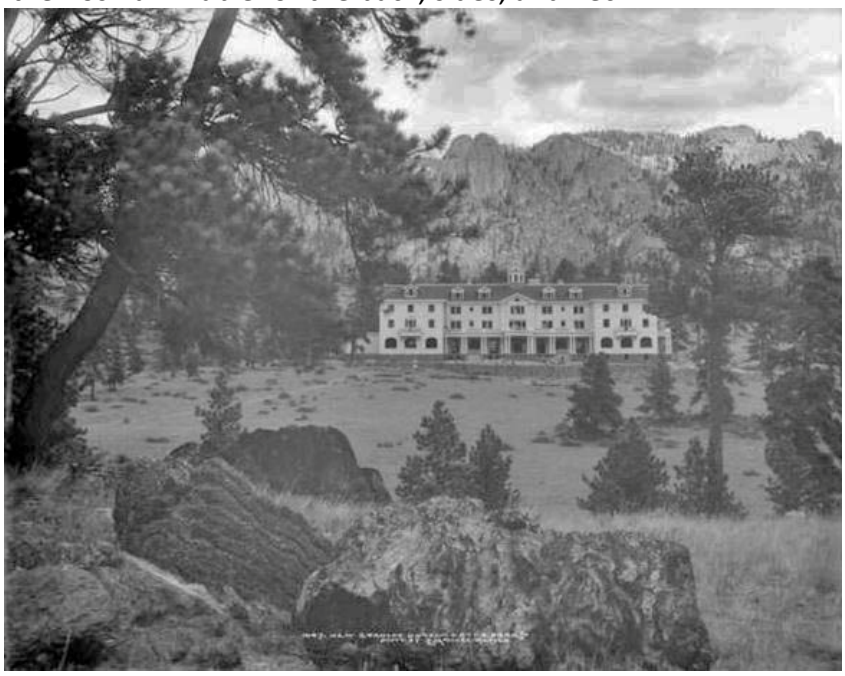


Mr. Stanley with one of his violins

- Mr. Stanley was a very creative man; he held patents on several different inventions:
- The Steam Powered Car
- The airbrush (which would later become the first fuel injector)
- A technical Drawing set for Drafters
- A photographic dry plate process (he later sold this process to George Eastman)

F.O. Stanley

Another project that F.O. had was making violins. In the plant that was manufacturing the Stanley Steamer, they were also fabricating Stanley violins. They closed part of the car production are for this purpose. F.O. traveled to Cremona to purchase spruce violin tops and to Germany for the Bosnian Mable for the back, sides, and neck.



A classic view of the Hotel

F. E. Stanley was killed on July 21, 1918 in a car accident in Ipswich, IA.

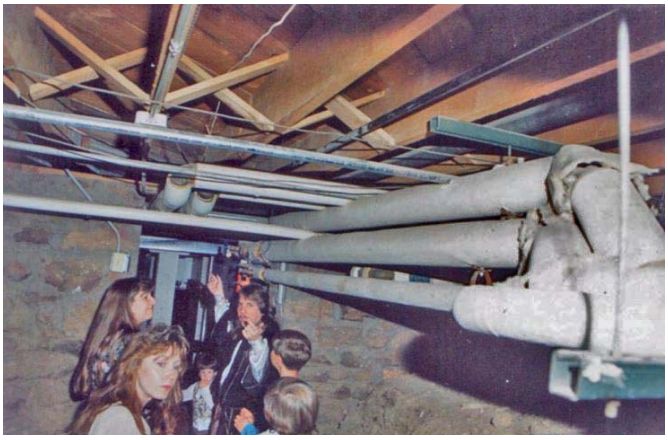
Because of the death of his brother, Mr. Stanley sold the Stanley Steamer Motor Company to Abner Doble in 1918.

A view of the Hotel and the Mountains

After purchasing the land in Estes Park, Mr. Stanley collaborated with B.D. Sanborn and formed the Estes Park Development Company. In 1914 Mr. Sanborn died.

Old photo of the front desk

In 1908, Mr. Stanley with the assistance of four partners formed the Estes Park Water Company



Inside the “Tunnel”

On October 30, 1908, Mr. Stanley started the Estes Park Power and Light Company. The company had no way to monitor the use of the electricity so they charged by the number of light bulbs that were being used. They built a hydroelectric power generating plant; it provided power for the hotel and the village. The plant was in operation until 1982. The plant was re-opened as a museum in 2002 with a grant from the Colorado State Historic Fund.

The Hotel:

Mr. Stanley hired architect T. Robert Wieger and Contractor Frank Kirchoff to design and construct Mr. Stanley's new Hotel. The Hotel ground would include the Main Lodge, two dormitory residence halls, one warehouse, one auditorium, and a house. It would have a Bowling alley, billiards rooms, and even a Casino. The Manor House is the second building to the ease of the main Hotel. It includes dining rooms, a pool hall, kitchen, and its own heat, so unlike the main Hotel it could be used in the winter. The Auditorium is the third building to the east of the main Hotel it features a main hall and had two bowling lanes in the basement. The Carriage House is the fourth building to the east of the main Hotel and it was constructed specifically to store Stanley Steamers. The total cost would be $500,000.

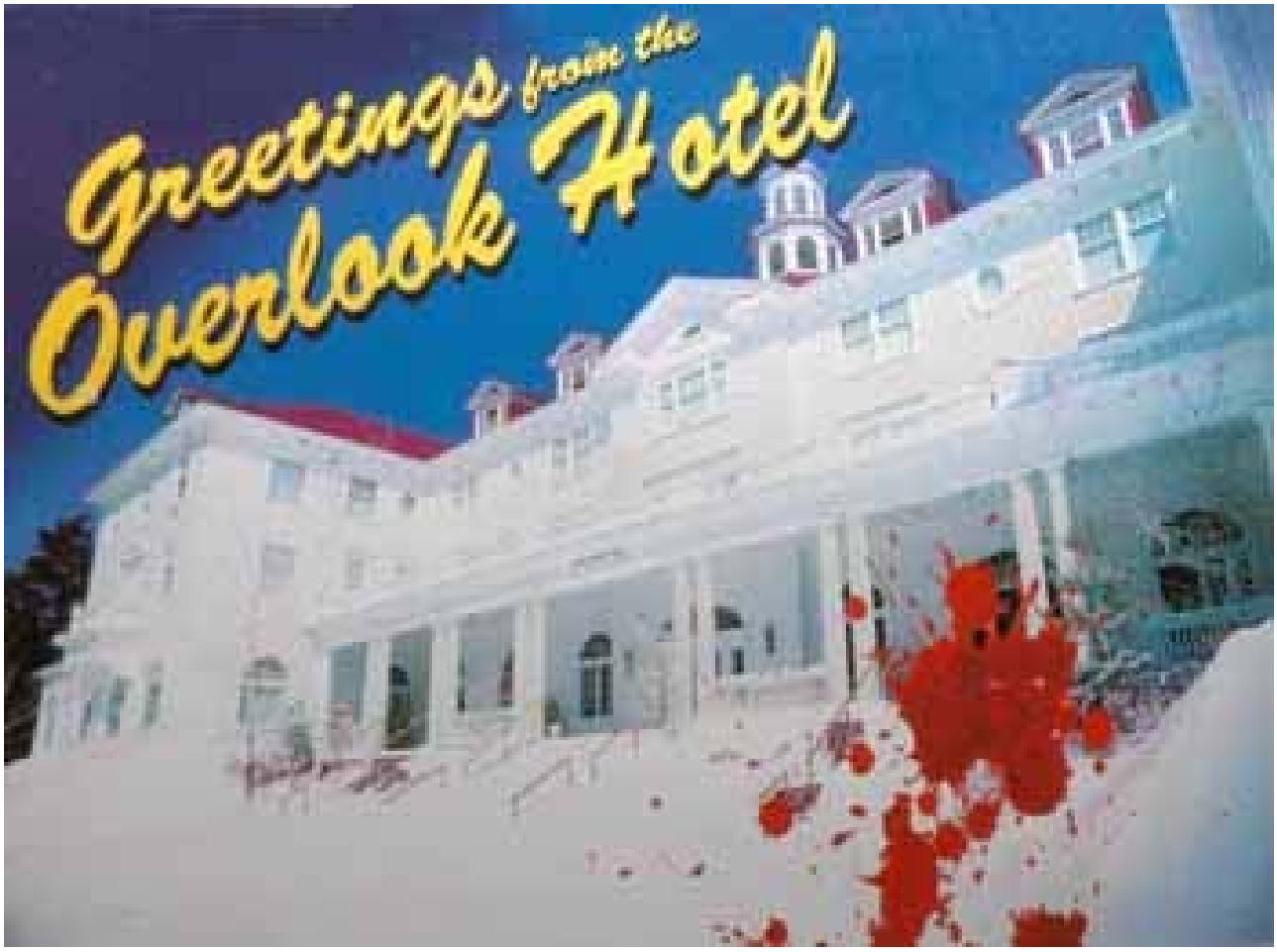
Baxter and Stu in the Music Room

Mr. Stanley wanted to name the Hotel the “Hotel Dunraven” in honor of the first owner of the land (who he had stolen the property from). However, the locals did not like the name, so they convinced the local newspaper to hold a contest. This was a contest to “help” name the new Hotel. A $10.00 prize was offered to the person with the winning name. The winning suggestion was submitted on October 5, 1908 and signed by 132 residents (written on deerskin). Mr. Stanley relented and named it the “Stanley Hotel” per the suggestion of the locals.

The sign during the filming of the Shining series

Construction was completed in 1909.

The hotel opened on June 19, 1909 however, the construction was not completed until 1910.



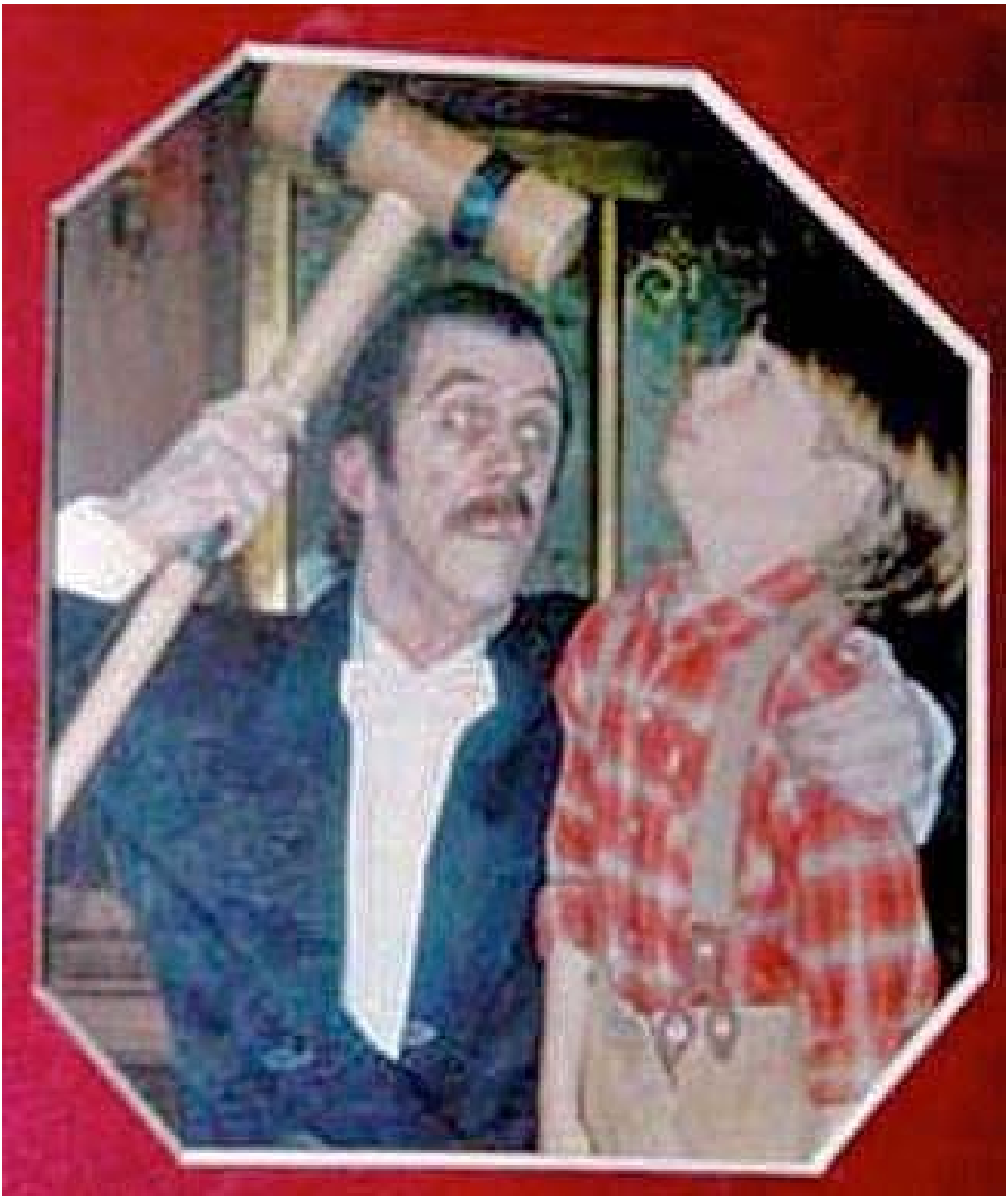
Promotion for the Shining series

The Hotel hosted a convention of Pharmacists on opening day; they had 125 members and their wives. The guests were escorted in style from the Loveland train station to the Hotel with the assistance of twenty-two Stanley Steamers.

Stephen King as the Conductor

The Hotel was considerably more expensive than most others were. The range was $5-8 per day or $84 per week

Mr. Stanley sold the Hotel in 1926 and it was intermittently open until 1980, however it was closed for the duration of World War II.



Production shot from the Shining series

Mr. Stanley died of “heart complications” on October 2, 1940 in Newton MA.

In 1979. the addition of heat to the main Hotel was added. This meant that they could stay open for the winter months.

Miniature of Hotel for Shining series

In 1995, the Hotel changed ownership due to bankruptcy

Baxter and Bryan "levitating" the table in the Manor House

On March 25, 2002 the Concert Hall was re-dedicated after a major remodel

Base location during investigation in Billiards room

During the filming of the Shining TV mini-series, the interior was modified extensively. The plaster accents and were stained to look like wood. Doors were removed from some of the main lobby area and replaced with swinging doors, the carpet on the main staircase was replaced, and a new “Bandstand” was constructed in the McGregor room. They also constructed a recreation of a portion of the roof in the front of the hotel so actors could safely be on the roof for extended shots. They also constructed several miniatures of the Hotel for the finale of the show (one is still in the basement of the Hotel near the “ghost tour” office)

Lobby of main Hotel

Throughout its life, the Stanley has had many famous guests; Molly Brown (stayed in Rm. 217), John Philip Sousa, Theodore Roosevelt, The Emperor and Empress of Japan, Jim Carey, Stephen King, and many more.

Stories from the Hotel:

In June 1911, Elizabeth Wilson (a Chambermaid) went to room 217 to light a lamp. However, the gas had had been left on, so when she tried to light it the gas was ignited and there was a large explosion. The explosion blew out part of the front wall of the Hotel and the floor of the room. Elizabeth fell to the floor below breaking both ankles. Four busboys sustained minor injuries as well. When Mr. Stanley found out about Elizabeth's injuries, he not only covered the medical costs but also offered her "lifetime employment" which she completed. The total cost of the repairs was $60,000

Lobby of Hotel near Gift Shop

In 1974, Stephen King and his wife Tabitha were leaving the area and needed a place to spend the night. They stopped at the Stanley and were told that they were closing for the winter and they would need to find another place to stay. Mr. King convinced the Hotel staff that they needed to stay at the Hotel for the night. They were given the keys to room 218. During the stay, Mr. King reported that they unpacked their suitcases and went outside for a walk. When they returned, they discovered that all of their belongings had been placed back into their suitcases. This seemed odd because the housekeeping staff had already left for the season. One other experience that Mr. King has was late on the night of their stay, he says that he encountered a small girl crying and looking for her Mother. Mr. King says that the Hotel did inspire his writing of the book The Shining, but it was not based directly on the location. Stephen King did return to the Hotel in 1995 to film the TV mini-series of The Shining.

While the mini-series was being filmed, Bryan (of Rocky Mountain Paranormal) got to photographs a wedding at the Hotel. They stopped the production long enough for the wedding to happen. This allowed access to locations in the Hotel that were normally not accessible to guests such as the “tunnel”

There is an unverified story that in the mid 1990’s there was the body of a homeless person found in the crawlspace of the Concert Hall. They had apparently crawled in and frozen to death.

Main Stairs

In 1994, the movie Dumb & Dumber was filmed at the Hotel. There is an unconfirmed story that Jim Carrey who was staying at the Hotel, came down in the middle of the night complaining about some kind of paranormal experience. He returned his keys and went to another Hotel.

Reported Activity:

Front desk

The Music Room has a piano (Mrs. Stanley's) that has been reported to play by itself by many guests and Hotel staff

Bandstand added by Stephen King in the McGregor Room

On December 30, 1970 Arty Roberts a housekeeper was clearing the floor of the McGregor room and claims “I felt like I had entered another time: she says that she saw “a room full of people in period clothing attending a party” she saw “a woman in a green dress and broad brimmed hat” and at that later when she was cleaning the Concert Hall, something locked her in the women’s room grabbed my hand and made me write “Mary Donovan August 18 1927” on the mirror. She thought it was the name of the woman in green.

Room 401

In 1983, Mark Lorenz a Bellman reported that he was working late one evening and witnessed the elevator moving by itself. He claimed that he could even see the controls moving.

Balcony of room 401

In 2003, Carissa Delisse a Night Clerk, reported that she was having the feeling of being watched and eventually saw what she thought was Mr. Stanley looking at her from the other side of the lobby counter. She said that just as she recognized him he just vanished.

Entrance to room 401

In February 2004, Mark Lorenz a Bellman was behind the front desk around 10:30 p.m. ad says that he heard footsteps coming from the bar. When he went to investigate, he says that he was the reflection of a woman in the window of the bar but upon further inspection could not find anyone.

The fourth floor was once the staff housing and it seems to have the majority of the paranormal.

There are reports of children running throughout the halls of the fourth floor, some claim that they originate from room 418. When checking out there was a couple who complained about

the children that were playing in the halls all night, when there were none staying on the fourth floor.

Billiards Room

Room 407 is claimed to be a favorite of the ghost of Lord Dunraven, he has been seen standing by the bathroom door. The lights in the room are said to turn on and off by themselves. Many people have also reported seeing a man looking out of the window in room 407 when nobody was on the fourth floor.

Bill in Manor House room

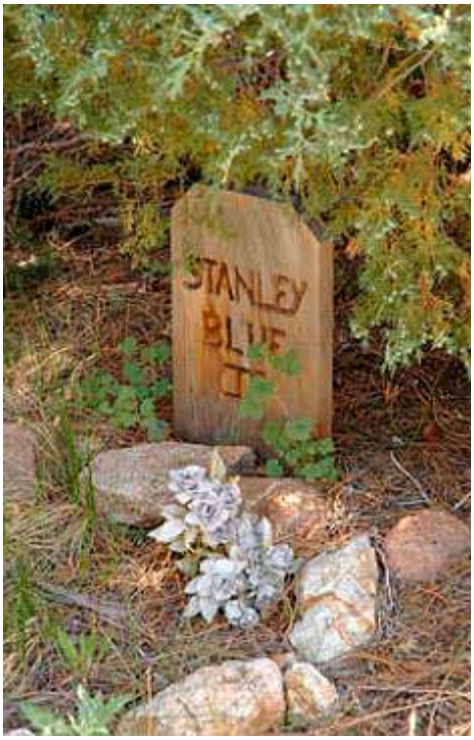
There have been multiple reports of seeing Mrs. Stanley in the Music room. Some claim that she has been seen playing the piano.

Room 217 has reports of people having their luggage packed/un-packed when they return to the room.

Bill in Manor House room

Rooms 219 and 222 have had reports of unusual noises and doors opening and closing on their own

In 2003 a housekeeper reported seeing a “see-through person) in room 318. Another guest reported that mattress started moving on its own in 318



Grave in the Pet Sematary

Guests reported that in room 340 the bathroom door slammed shut and locked by itself

“Casper” the Raccoon

The Reverend Kimberly Henry and her husband were staying in room 401 and reported seeing a man standing by the closet that “had a distinct bald spot” they also claim that they witnessed things moving around the room by themselves.

There have been reports of seeing Mrs. Stanley in the Managers residence.

Investigations:

A production company that said they were producing a new documentary about the Ghosts of the Stanley and would like us to be the local paranormal team contacted us; we agreed and set up the investigation.

April 4, 2007
We arrived in the late afternoon and started our strategy for the setup.

Areas monitored:

- Room 401
- Room 418
- Room 1302 (in the Manor House)
- The Concert Hall

We determine that the setup would be:

- Room 401 – two video cameras one looking at the bed and one towards the closet in the room one in the hall and one looking at the stairs to the attic. One microphone in the room and one in the hallway near the attic stairs. One thermometer in the room and one in the hallway
- Room 418 – two video cameras and EMF meter and a digital audio recorder (locked in the room alone)
- Room 1302 – No monitoring equipment just investigators in the room
- Concert Hall – two video cameras in the main hall, one video camera in the hallway and one at the front door. One microphone in the main hall and one at the front door

Room 401 – The investigation and the hallway were reasonably quiet. On a few occasions, the production company would stop by but it was not too much to hinder the investigation.

EMF readings were taken hourly through the night and were stable

There was a slight drop in temperature in the main room as the night progressed, but this was due to the normal cooling of the room from outside temperatures

At 3:30, there was the sound of a woman on the audio. She was seen on camera leaving the location and came back about three minutes later. Eventually we heard a very loud noise and notice that people were exiting the room next door and attempting to steal the television from the room. Security was notified.

During the evening, we noticed that the door to the closet would occasionally open/close. We set up a seismometer in the room and discovered that the cause of the vibrations making the door move was coming from the antique elevator that is directly behind the closet. We had previously noted that the dresser in the slowly “walks” into the room due to the same vibration.

Room 418 – We left the equipment in the room and locked the door for the duration of the investigation. There were reports of a “hypnotist” that had been in the room on the previous night, seated in the chair at the foot of the bed near the bathroom door. He claimed that he was “sensing” something and “collapsed” when he stood up. The production company concluded that he had retained some “energy” because their EMF meters were off the charts when they measured him in that location. We followed up and discovered that there is a large power bus that enters the building and goes through that wall. When the “psychic” was being measured for EMF, he was simply reflecting the EMF coming from the wall and did not have any residual or stored energy.

The recording from our investigation of the room had no usual results.

The Concert Hall – There was a report of activity in one of the rooms from the production company, they stated that on the previous night Grant Wilson from the Ghost Hunters TV show had been in the room with them and a table that was leaning against a wall “suddenly fell.” Bill Murphy of the production team claimed to feel so bad that he had to leave the room. We examined the room and discovered that the tables had been stacked unevenly as this was a storage room and it most likely fell due to the large group of people going in and out of the room. We also discovered that there was a major rewire of the electrical in the building because it was in such bad condition. This room was where the main breaker panel for the building was located and there was exposed “Hot” wiring throughout the room. This could account for some of the reported activity in the room, but it is inconclusive.

It was a difficult place for an investigation due to the electrician working on the power panel until after 2:00 a.m. We were able to spend a little time getting used to the normal sounds of the theater such as the heat turning on and off, pops and cracks due to the building cooling for the night, and the rare care that would drive by. Around 4:00 a.m., we heard what sounded like someone moving around on the floor of the main hall. This sound continued to escalate as time went on. We had the only key to the Hall with us and had verified that there was nobody else in the building, after a while the noises got much louder. One of our investigators was ready to go check out the source of the sounds when another investigator told him to wait. It was just about that time that the sound of a door creaking and slamming shut was heard. We immediately checked to see if we could figure out what had made the sound but the only thing that made that sound was the front door slamming shut. The door had been on camera and did not move.

EMF readings were consistent throughout the evening and other than the bad wiring and the construction there were no unusual readings.

When one of our investigators was going to room 1302, the upstairs of the building was completely dark; apparently, we had forgotten to turn them on earlier. When they were approaching the room, they heard movement and saw what they described as “glowing eyes” in the main lobby of the second floor. When they turned on the lights, they discovered that a raccoon that had decided to relax on the sofa in the room was watching them. He was rather friendly and eventually wandered out a window and joined several others.

Animals for Maze during filming of Shining series

We discovered that the “documentary” that we were filming for was based on a “theory” about the geology of the area. This “theory” was that “large deposits of quartz, magnetite, and Limestone” were under the hotel and creating the environment allowing ghosts to manifest. We contacted many different groups who made this claim and they all referred us to “data on-line” or the episode of Ghost Hunters when they visited the Hotel. We contacted the Ghost Hunters and were told that the information came from “someone at the gift shop.” We decided that the facts about the “theory” needed to be examined, so we contacted the U.S. Department of Agriculture who said “-Apparently, ghost hunters are interested in our data now. It is the most unique and interesting request I have received in my 30-year career!” He replied, “I reviewed the Aeromagnetic data for Colorado. Aeromagnetic surveys detect changes in the earth’s magnetic field. The magnetic field is strengthened by the presence of metallic components in bedrock and more so by the presence of minerals with magnetic properties such as magnetite. There is nothing unusual about the aeromagnetic data in the area of Estes Park as compared to the general area of the Rockies. I hope this helps. So at this point it looks link the magnetite (or anything magnetic) in nature is slowly getting ruled out, but I will continue working. At this point, we started working with the scientists to see if a soil survey had been conducted at the Stanley. After working with several different divisions of the Government, we

discovered that there had never been a survey of the property or anywhere near it. We worked with the USDA schedule and conduct a soil survey at the Stanley and surrounding areas.

The Concert Hall

The known details to the area were basic but provided some good initial data. “Granitic Rocks of 1,400 M.Y. Age Group – Botanic Genesis & Schist, Granite bedrock at approximately 20 inches deep, and water table within 37 inches. Elevation 7,500 – 8,700 feet. Mean annual precipitation 16-22 inches. Mean annual air temperature 42-46 degrees. Frost free period 70-100 days. Vegetative classification, Ponderosa Pine/Antelope bitter-brush”

After getting the approval from the owners of the Stanley Hotel, we scheduled a time for the soil survey to be completed. The survey would include several different modes of study. The team was being assembled and we would meet them at the Hotel on July 30 to start a two-day study into the geology of the property.

Monitoring location in the Concert Hall

The different types of equipment used:

- Ground Penetrating Radar – Used to “look” at different types of underground formations

- Electromagnetic Soil Analysis – By using electromagnetic induction the soil salinity and electromagnetic properties are recorded

- Soil Analysis – Used to determine the soil content of the area (scientists digging)

The Concert Hall

The first day of the survey started with a general mapping of the land using GPS and continued with the collecting of samples at several different locations on the property.

The first of the digging allowed the team to determine the average depth of the bedrock (27 inches)

The first day also included the use of the electromagnetic induction. This technique determines the salinity and electromagnetic properties of the samples.

The studies were conducted on the main property of the Stanley Hotel as well as the area near the old “Ice pond” a pet cemetery and a ranch located on the other side of the mountain. This allowed for a baseline for adjacent areas.

Concert Hall

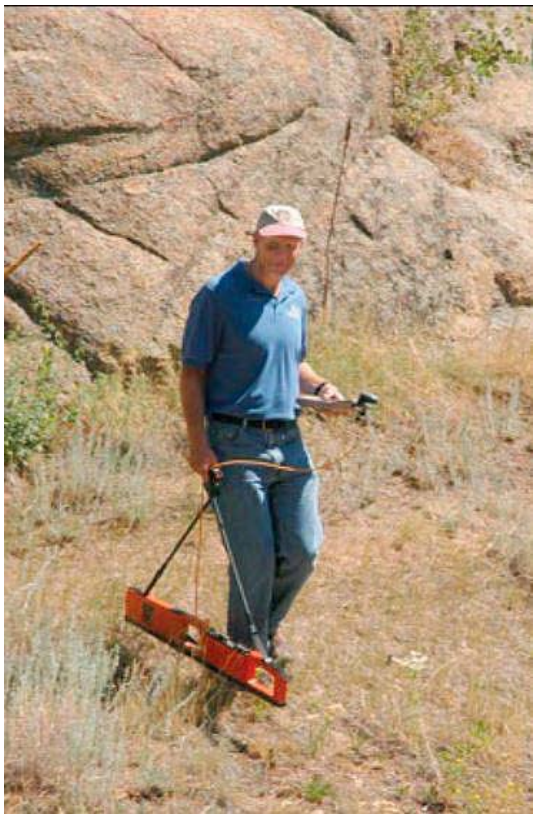
The second day the team continued with the previous studies and added the Ground Penetrating Radar. The Ground Penetrating Radar allows the team to look for underground objects as well as the distance to bedrock in large areas.

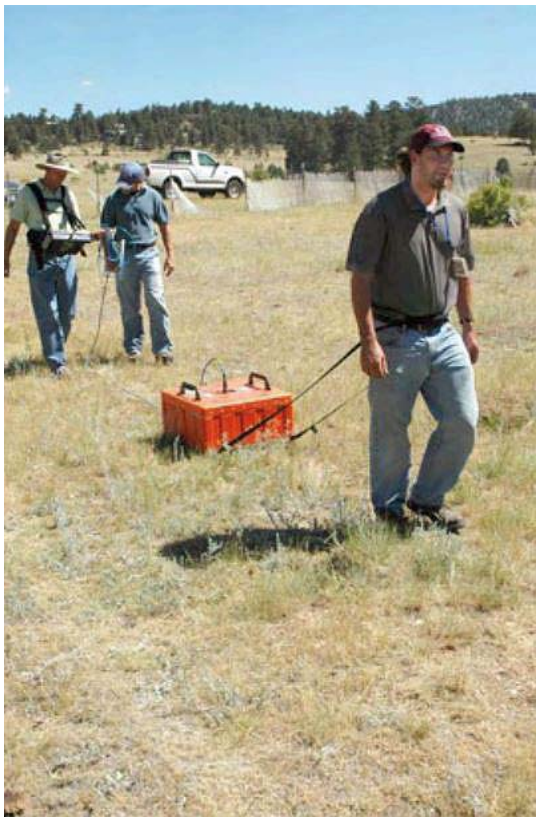
After the team concluded the study, the visit was concluded with a “ghost tour” of the Stanley. The tour did have one unusual moment when the scientists entered the “tunnel.” When they were being told the stories of the tunnel we noticed that they were no longer listening to the tour guide and instead were looking at the walls of the room. The conversation immediately went to the dirt that the tunnel was made of.

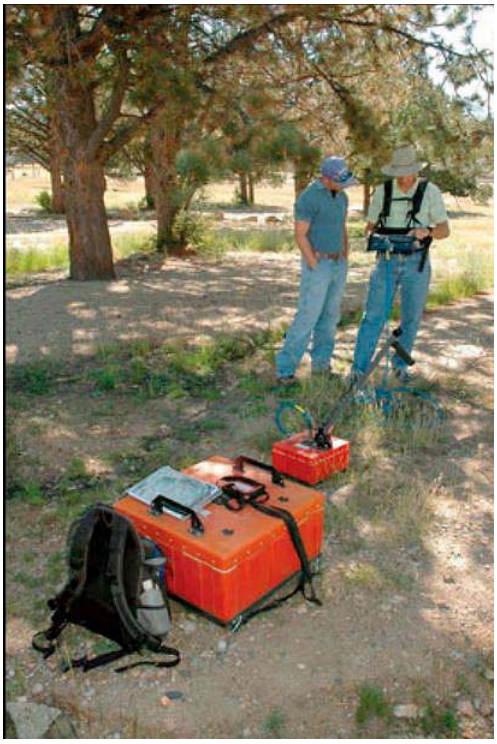
Study Results:

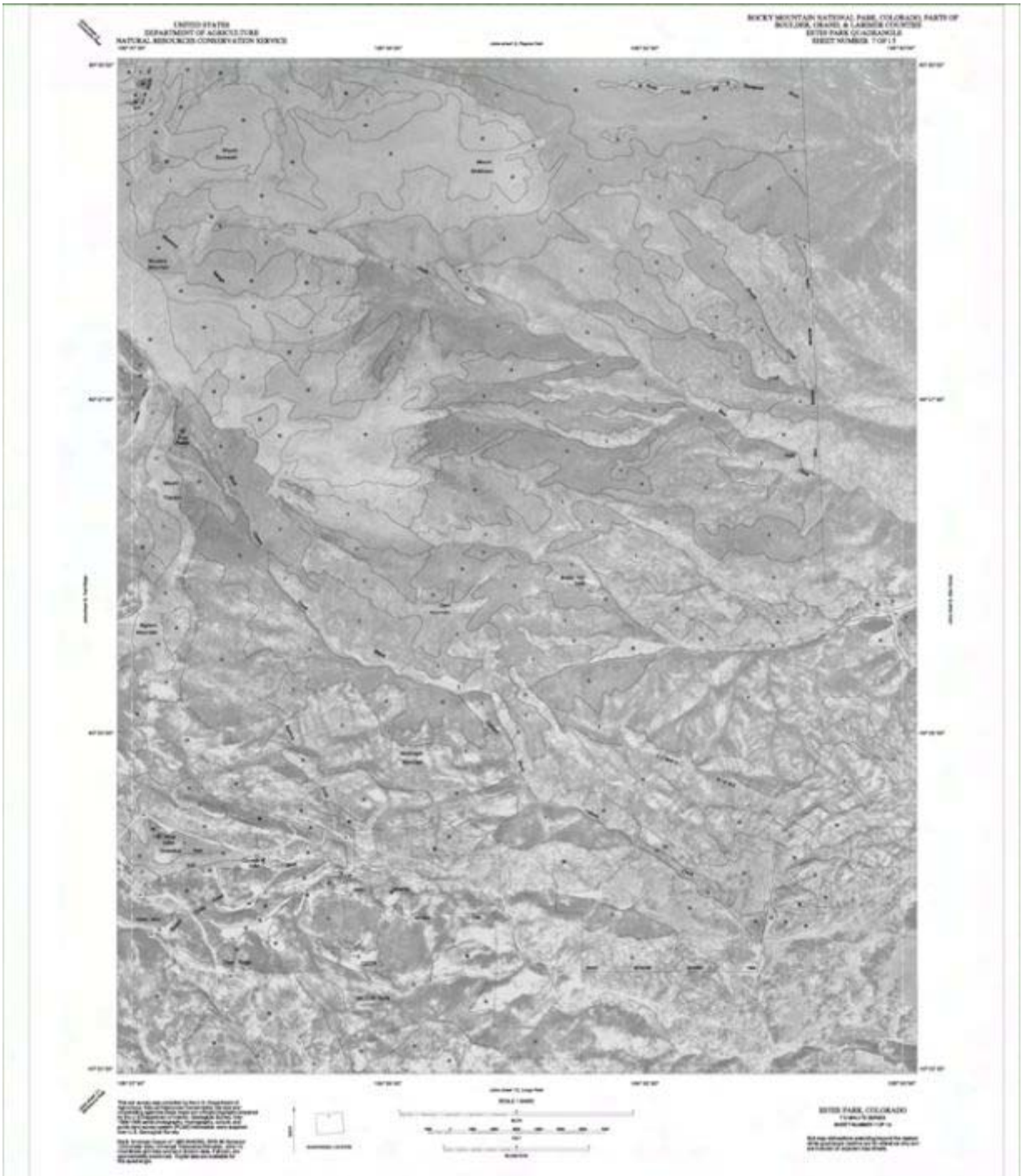
The conclusions of the soil survey were consistent with the data collected from the rest of the Estes Park region.
The soil is primarily crumbled Schist. Schist is a rock formed by dynamic-high-temperature, high-pressure metamorphism that involves a lot of strain. The high strain aligns the flat or elongated grains of mica, hornblende, and other minerals into thin layers, or foliation. At least 50 percent of the mineral grains in schist are aligned this way (less than 50 percent makes it genesis) However the content of one specific mineral is not noted. The distance to bedrock in the area ranges from surface level to approximately 27 inches. The rumors of large deposits of quartz and magnetite have been confirmed as false, so the reported paranormal activity needs to be looked at again without the inclusion of this claim.

Photos from Soil Survey









United States Department of Agriculture

NRCS

Natural Resources Conservation Service
National Soil Survey Center
207 W. Main Street, Room G-08
Wilkesboro, NC 28697

Phone: (402) 437-5499
FAX: (402) 437-5336

SUBJECT: MGT – Trip Reports, Geophysical Field Assistance October 15, 2008

TO: Allen Green, STC
USDA NRCS
655 Parfet Street, Suite 201, Room E200C,
Lakewood, CO 80215-5517

File Code: 330-7

Purpose: To provide site assessment assistance using electromagnetic induction (EMI) techniques and ground-penetrating radar (GPR) in Estes Park, CO.

Participants:
Matt Baxter, Researcher/Investigator, Rocky Mountain Paranormal Research Society, Denver, CO
Bryan Bonner, Researcher/Investigator, Rocky Mountain Paranormal Research Society, Denver, CO
Chris Fabian, MLRA Soil Survey Leader, USDA-NRCS, Fort Collins, CO
Mike Moore, Soil Scientist, USDA-NRCS, Fort Morgan, CO
Steve Park, MLRA Office Leader/State Soil Scientist, USDA-NRCS, Lakewood, CO
Jason Peel, Irrigation Water Management Specialist, USDA-NRCS, Lakewood, CO
David Smithey, NRCS Earth Team Volunteer, Wilkesboro, NC
Andy Steinert, MLRA Soil Survey Leader, USDA-NRCS, Fort Morgan, CO
Wes Tuttle, Soil Scientist (Geophysical), USDA-NRCS-NSSC, Wilkesboro, NC

Activities:
All field activities were completed on July 30 and 31, 2008.

Summary of Results:

1. An EMI survey was completed with the Geonics EM38 meter near the Stanley Hotel located in Estes Park, Colorado. Apparent conductivity remained fairly constant across the survey area (except in areas with anomalous spikes in conductivity) with only minor variations suggesting similar soil characteristics. Soil borings across the area revealed similar soil profiles containing dominantly shallow depths to bedrock (<50 cm). A small narrow drainageway was located in the most western portion of the survey area. Increased moisture in this area is thought to contribute to slightly higher apparent conductivity. Several anomalous features resulting in higher and lower apparent conductivity were observed in the EMI survey. These anomalous features were thought to be associated with metallic objects either on the surface or beneath the soil surface. Many of these objects were thought to be underground utilities/utility lines or man-made concrete structures thought to contain metal reinforcement (concrete pads with rebar/wire).

2. Overall spatial patterns resulting from the Dualem-2 meter (mobile survey) were similar to spatial patterns observed with the EM38 meter during the pedestrian survey completed near the Stanley Hotel, Estes Park, Colorado. Changes in apparent conductivity were thought to be associated with changes in soil characteristics. While comparing the Dualem-2 meter and the EM38 meter, both instruments recorded anomalous spikes in conductivity thought to be associated with metal debris and underground utilities. The survey conducted with the Dualem-2 meter resulted in slightly higher apparent conductivity as compared to the survey completed with the EM38 meter. This is thought to be attributed to differences in manufacturer and field calibration of the two different instruments. Also, metal used in the construction of the EMI cart (metal bearings and metal nuts and bolts) is within the electromagnetic field of the EMI meter and is thought to contribute to the slightly higher apparent conductivity, especially in the near-surface geometry (PRP-shallower sensing) of the Dualem-2 meter while comparing geometries. The PRP geometry is more sensitive to

near-surface contributions to apparent conductivity as compared to the HCP geometry. The HCP and the PRP geometries resulted in similar interpretations.

3. There did not appear to be any "unexplainable" spatial patterns of apparent conductivity or "mysterious" anomalous features resulting from the EMI **pedestrian** survey or the EMI **mobile** survey completed near the Stanley Hotel. All observable features associated with changes in apparent conductivity were thought to have reasonable explanations.

4. The majority of the radar records obtained with the 200 and 400 MHz antennas near the Stanley Hotel and at the MacGregor Ranch were of marginal to poor interpretative quality. High rates of signal attenuation (signal scatter) significantly limited observation depths and overall effectiveness of GPR at the sites. Radar records with meaningful interpretations were achieved in only a few areas. Even though interpretations were limited at the two sites surveyed (Stanley Hotel and MacGregor Ranch) with GPR, a combination of soil borings and radar records did reveal shallower depths to bedrock than originally thought. The dominant soils at the two sites were originally thought to be moderately deep to bedrock (50 cm to 100 cm). A significant component of soils containing shallow depths to bedrock (< 50 cm) was observed within the map unit.

5. Geophysical interpretations are considered preliminary estimates of site conditions. The results of all geophysical investigations are interpretive and do not substitute for direct soil borings. The use of geophysical methods can reduce the number of soil observations, direct their placement, and supplement their interpretations. Interpretations should be verified by ground-truth observations.

I would also like to give a special thanks to Jason Peel for providing assistance to our investigative efforts in Estes Park, Colorado. Jason did an excellent job while independently conducting the mobile EMI survey with the Dualem-2 meter. Jason provided the conductivity data for the mobile survey (Dualem-2 meter) contained in this report.

It was my pleasure to work again in Colorado and with members of your fine staff.

Sincerely,

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Equipment:
The radar unit is the TerraSIRch SIR (Subsurface Interface Radar) System-3000, manufactured by Geophysical Survey Systems, Inc.[1] Morey (1974), Doolittle (1987), and Daniels (1996) have discussed the use and operation of GPR. The SIR System-3000 consists of a digital control unit (DC-3000) with keypad, color SVGA video screen, and connector panel. A 10.8-volt Lithium-Ion rechargeable battery powers the system. This unit is backpack portable and, with an antenna, requires two people to operate. The antennas used in this study have center frequencies of 200 and 400 MHz.

[1] Manufacturer's names are provided for specific information; use does not constitute endorsement.

The RADAN for Windows (version 5.0) software program was used to process the radar records (Geophysical Survey Systems, Inc, 2003).[1] Processing included color transformation, marker editing, surface normalization, and range gain adjustments.

Geonics Limited manufactures the EM38 meter.[1] This meter is portable and requires only one person to operate. No ground contact is required with this meter. McNeill (1980) and Geonics Limited (1998) have described principles of operation for the EM38 meter. Lateral resolution is approximately equal to its intercoil spacing. The EM38 meter has a 1 m intercoil spacing and operates at a frequency of 14,600 Hz. When placed on the soil surface, this instrument has a theoretical penetration depth of about 0.75 and 1.5 m in the horizontal and vertical dipole orientations, respectively (Geonics Limited, 1998). Values of apparent conductivity are expressed in millisiemens per meter (mS/m).

Dualem Inc. manufactures the Dualem-2/4 meters.[1] Taylor (2002) describes the principles of operation for these meters. The meters consist of one transmitter and two receiver coils. One receiver coil and the transmitter coil provide perpendicular (PRP) geometry. The other receiver coil provides a horizontal co-planar (HCP) geometry with the transmitter coil. This dual system permits two depths to be simultaneously measured without rotating the coils. The depth of penetration is "geometry limited" and is dependent upon the intercoil spacing and coil geometry. The Dualem-2/4 meters operate at a frequency of about 9 kHz. The Dualem-2 meter has a 2-m intercoil spacing and provides penetration depths of 1.3 and 3.0 m in the PRP and HCP geometries, respectively. The Dualem-4 meter has a 4-m intercoil spacing and provides penetration depths of 2.5 and 6.0 m in the PRP and HCP geometries, respectively. The meter is keypad operated and measurements can either be automatically or manually triggered.

An Allegro field computer (with the EM38 meter) and a Hewlett Packard Tablet PC (with the Dualem-2 meter) were used to collect EMI data. A Garmin GPS Map 76 receiver (with a CSI Radio Beacon receiver, antenna, and accessories) was used in combination with the Dualem-2 meter and an Allegro field computer was used in combination with the EM38 meter to record and store EMI data. The Allegro field computer is keypad operated and measurements can either be automatically or manually triggered. EMI data was geo-referenced with a GM-210 GPS receiver manufactured by HOLUX Technology, Inc.[1]

An EMI cart was towed by a 4x4 ATV. The Dualem-2 meter was mounted to the EMI cart for the purposes of data acquisition during the mobile survey. A pedestrian survey was conducted with the EM38 meter.

To help summarize the results of this study, SURFER for Windows (version 8.0) program, developed by Golden Software, Inc.,[1] was used to construct two-dimensional simulations. Grids were created using kriging methods with an octant search.

Ground-Penetrating Radar:
Ground-penetrating radar is a time scaled system. The system measures the time it takes electromagnetic energy to travel from an antenna to an interface (i.e., soil horizon, stratigraphic layer) and back. To convert travel time into a depth scale requires knowledge of the velocity of pulse propagation. Several methods are available to determine the velocity of propagation. These methods include use of table values, common midpoint calibration, and calibration over a target of known depth. The last method is considered the most direct and accurate method to estimate propagation velocity (Conyers and Goodman, 1997). The procedure involves measuring the two-way travel time to a known reflector that appears on a radar record and calculating the propagation velocity by using the following equation (after Morey, 1974):

$$V = 2D/T \quad [1]$$

Equation [1] describes the relationship between the propagation velocity (V), depth (D), and two-way pulse travel time (T) to a subsurface reflector. During this study, the two-way radar pulse travel time was compared with measured depths to known subsurface interfaces within each study site. Computed propagation velocities were used to scale the radar records.

Electromagnetic Induction:
Electromagnetic induction is a noninvasive geophysical tool that is used for high intensity surveys and detailed site assessments. Advantages of EMI are its portability, speed of operation, flexible observation depths, and moderate resolution of subsurface features. Results of EMI surveys are interpretable in the field. This geophysical method can provide in a relatively short time the large number of observations that are needed to comprehensively cover sites. Maps prepared from correctly interpreted EMI data provide the basis for characterizing site conditions, planning further investigations, and locating sampling or monitoring sites.

Electromagnetic induction uses electromagnetic energy to measure the apparent conductivity (ECa) of earthen materials. Current flow is induced into the soil. This induced current flow is proportional to the electrical conductivity of the conducting body (ECa) for a given strength of EM field. The current flow creates a secondary electromagnetic field, the strength of which is proportional of the current flow, and hence, to ECa. ECa may be inferred from the magnitude of the induced secondary EM field generated upon imposition of a primary EM field on the conductor (soil) (Corwin and Rhoades, 1990).

Apparent conductivity is a weighted, average conductivity measurement for a column of earthen materials to a specific depth (Greenhouse and Slaine, 1983). Variations in apparent conductivity are caused by changes in the electrical conductivity of earthen materials. Electrical conductivity is influenced by the volumetric water content, phase of the soil water, temperature, type and concentration of ions in solution, and amount and type of clays in the soil matrix (McNeill, 1980). Apparent conductivity is principally a measure of the combined interaction of the soil's soluble salt content, clay content and mineralogy, and water content. The apparent conductivity of soils increases with increased soluble salts, clay, and water contents (Kachanoski et al., 1988; Rhoades et al., 1976). In any soil-landscape, variations in one or more of these factors may dominate the EMI response.

Though seldom diagnostic in itself, lateral and vertical variations in apparent conductivity have been used to infer changes in soils and soil properties. As EMI measurements integrate the bulk physical and chemical properties for a defined observation depth into a single value, responses can be associated with changes in soils and soil map units (Doolittle et al., 1996; Jaynes et al., 1993). For each soil, the inherent variability in physical and chemical properties, as well as temporal variations in soil water and temperature, will establish a unique and characteristic range of observable apparent conductivity values. Recently, EMI has been used as a soil-mapping tool to assist precision farming (Jaynes et al., 1993; Sudduth et al., 1995).

Electromagnetic induction is not suitable for use in all soil investigations. Generally, the use of EMI has been most successful in areas where subsurface properties are reasonably homogeneous. The effects of one property (e.g. clay, water, or salt content) dominates over the other properties, and variations in EMI response can be related to changes in the dominant property (Cook et al., 1992). Within a given geographic area, most similar soils should have comparable EMI responses. Dissimilar soils should have disparate EMI responses. However, the conductivities of some similar and dissimilar soils will overlap. This occurs where contrasts in EMI responses caused by differences in one property are offset by differences in another property. Some soil properties and soils can be inferred or predicted with EMI, provided one is cognizant of changes in parent materials, topography, drainage, and vegetation.

Discussion: The Stanley Hotel has a history of reported paranormal activity over the past years. The hotel was built in the early 1900's by F.O. Stanley. There have been many unexplainable reports of ghostly apparitions, children playing, lights turning on and off, music playing, strange noises coming from empty rooms, and other haunting activities. The Rocky Mountain Paranormal Society is interested in any paranormal activity and measurable electromagnetic energy that may be present near the hotel. An EMI (electromagnetic induction) survey was completed near the hotel to assess the area for patterns of electromagnetic energy, explained or unexplained.

USDA, Natural Resources Conservation Service is currently completing a soil survey of the Estes Park area and is interested in depth to bedrock patterns of the area. An EMI survey and GPR survey will hopefully aid the soil survey team in decision making in the soils mapping project of the Estes Park area. This gained information will aid in map unit composition and naming of map units within the soil survey area.

Site 1: Estes Park - Stanley Hotel

Study site 1 is located in Estes Park, CO on property encompassing the Stanley Hotel. An EMI survey was conducted in an area of Cathedral-Ratake complex, 5 to 15 % slopes (USDA/NRCS update soil survey in progress). The shallow, well or somewhat excessively drained Cathedral soils formed in slope alluvium, colluvium, and residuum from granite or gneiss. These soils are on mountain slopes, ridges, and hills. Cathedral is a member of the loamy-skeletal, paramicaceous, frigid Lithic Haplustolls family. The shallow, well drained Ratake soils formed in materials weathered from igneous and metamorphic rocks on upland hills and ridges. Ratake is a member of the loamy-skeletal, paramicaceous, frigid, shallow Typic Haplustolls family. The site was dominantly grassed with a few sparse trees. Portions of the survey area are used for recreation. An old tennis court is within the survey area but is no longer used and is covered with a thin layer of sand and fine gravel. Underground utilities/utility lines are located within the survey area.

Pedestrian EMI Survey

Survey Design:

A wildcat EMI survey was completed at the site (refer to *Figure 1*). A grid system survey was not feasible due to the irregular shape of the survey area. A pedestrian survey was completed with the EM38 meter by walking at a fairly uniform pace across the survey area while providing representative areal coverage to accurately capture representative apparent conductivity and spatial patterns. The survey lines were spaced approximately 10 m apart. The EM38 meter was carried at a height of approximately 3 inches above the surface and was operated in the continuous mode with measurements recorded at a 1-sec interval. Measurements of apparent conductivity were collected in the vertical dipole orientation. Apparent conductivity measurements were geo-referenced with a GM-210 GPS receiver manufactured by HOLUX Technology, Inc. and were recorded with the Allegro field computer.

Results:

A total of 2376 measurements were recorded with the EM38 meter in the vertical dipole orientation. Apparent conductivity averaged -6.8 mS/m and ranged from -1023.5 to 177.5 mS/m. One-half of the observations had an apparent conductivity between -0.25 and 2.63 mS/m.

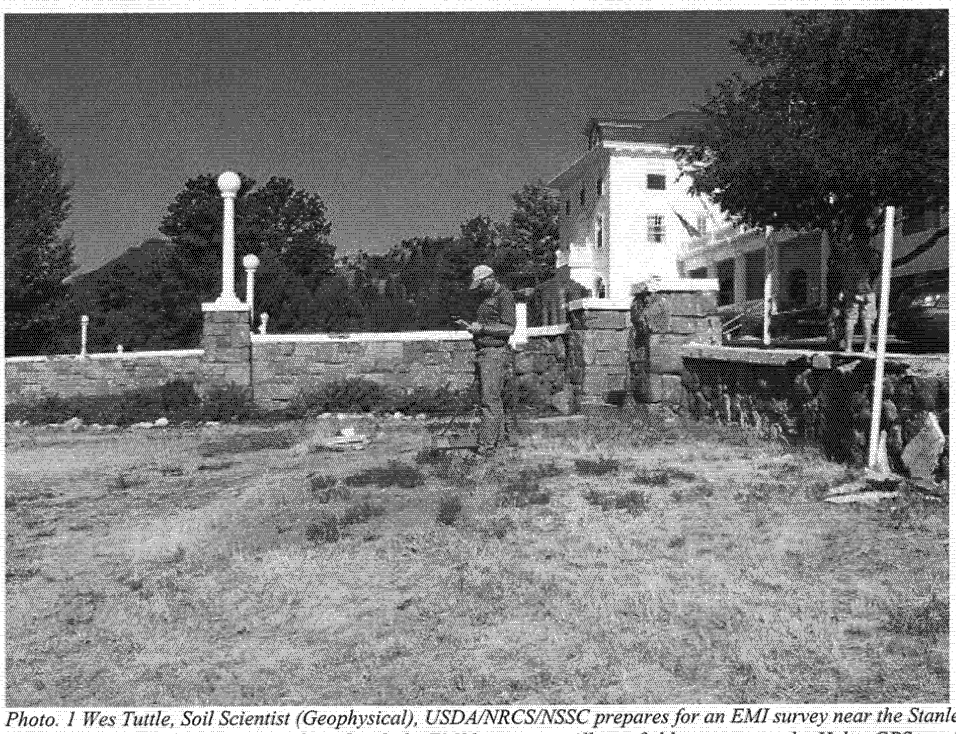

Photo. 1 Wes Tuttle, Soil Scientist (Geophysical), USDA/NRCS/NSSC prepares for an EMI survey near the Stanley Hotel, Estes Park, CO. The survey is being conducted with the EM38 meter, an Allegro field computer and a Holux GPS receiver. This data collection system allows for the collection of much larger data sets in combination with geo-referencing of apparent conductivity measurements.

Overall spatial patterns observed in *Figure 1* were thought to be associated with changes in soil characteristics. Apparent conductivity remained fairly constant across the survey area (except in areas with anomalous spikes in conductivity) with only minor variations suggesting similar soil characteristics. Soil borings across the survey area revealed similar soil profiles containing dominantly shallow depths to bedrock (<50 cm). Moisture contents appeared to be relatively similar across the survey area, as observed in soil borings. A small drainage area was located in the most western portion (left-hand portion) of the survey area near point **C**. Higher soil moisture content in this area is thought to result in higher apparent conductivity.

Several anomalous features (points **A**) resulting in higher and lower apparent conductivity can be observed in *Figure 1*. These anomalous features were thought to be associated with metallic objects either on the surface or beneath the soil surface. Many of these objects were associated with utilities. Very contrasting anomalous features can be observed near the "tennis court" area (underlain with a concrete pad) and the "concrete pad /utilities" area (shuffle board pad)). The concrete pads are thought to contain rebar or wire reinforcement resulting in the very high and low conductivity measurements in these areas. A linear feature containing higher apparent conductivity can be observed along the southern portions of the survey area in *Figure 1* (along points **B**). Higher conductivity in this area is thought to be attributed to an underground utility (electric) line connecting a series of lamp posts along the roadway.

There did not appear to be any "unexplainable" spatial patterns of apparent conductivity or "mysterious" anomalous features resulting from the EMI **pedestrian** survey completed near the Stanley Hotel. All observable features associated with changes in apparent conductivity were thought to have reasonable explanations.

the slightly higher apparent conductivity, especially in the near surface geometry (PRP-shallower sensing) of the Dualem-2 meter while comparing geometries. The PRP geometry is more sensitive to near-surface contributions to apparent conductivity as compared to the HCP geometry. Interpretations were similar while comparing the HCP and the PRP geometries.

Photo 2. Jason Peel, Irrigation Water Management Specialist, (USDA-NRCS) completes a mobile EMI survey with the Dulaem-2 meter at the Stanley Hotel, Estes Park, CO. The EMI mobile acquisition system observed in the photo consists of an ATV, an EMI cart, a Dualem-2 meter, a Garmin Map 76 GPS receiver, and a Hewlett Packard tablet PC. Mobile conductivity surveys are much more efficient than pedestrian surveys in survey areas containing large acreage.

The mobile survey (Dualem-2 meter) encompassed a larger area in comparison with the EM38 meter. Higher apparent conductivity associated with the depressional area (point **C**) observed in the pedestrian survey (*Figure 1* - EM38 meter) was not observed in the mobile survey (*Figure 2* – western portion) at the same location. This may have resulted from the relatively small and narrow size of the depressional area (2-3 m in width). The EM38 meter was also positioned in closer proximity to the soil surface (8 cm or 3 inches) as compared to the Dualem-2 meter height of approximately 35 cm (14 inches) and may have been more sensitive to small changes in apparent conductivity. Irrigation water from the nearby lawn was observed flowing through the depressional area.

Anomalous features observed in the mobile survey were also thought to be associated with underground utilities. A linear feature (*Figure 2* - yellow dashed line highlights the feature) thought to be associated with an underground utility line can be observed in the mobile survey below (south - southeast) the pool area. The feature is more pronounced in the shallower sensing PRP geometry.

The EMI survey conducted with the EM38 meter (*Figure 1*) resulted in a very large anomalous feature near the "tennis court" area. Anomalously high and low spikes in conductivity in this area were thought to be attributed to metal rebar/reinforcement wire within the underlying concrete pad of the tennis court. This feature was not observed in the mobile survey (Dualem-2 meter) in either the HCP or the PRP geometry. The absence of the feature is unknown.
There did not appear to be any "unexplainable" spatial patterns of apparent conductivity or "mysterious" anomalous features resulting from the EMI **mobile** survey completed near the Stanley Hotel. All observable features associated with changes in apparent conductivity were thought to have reasonable explanations.

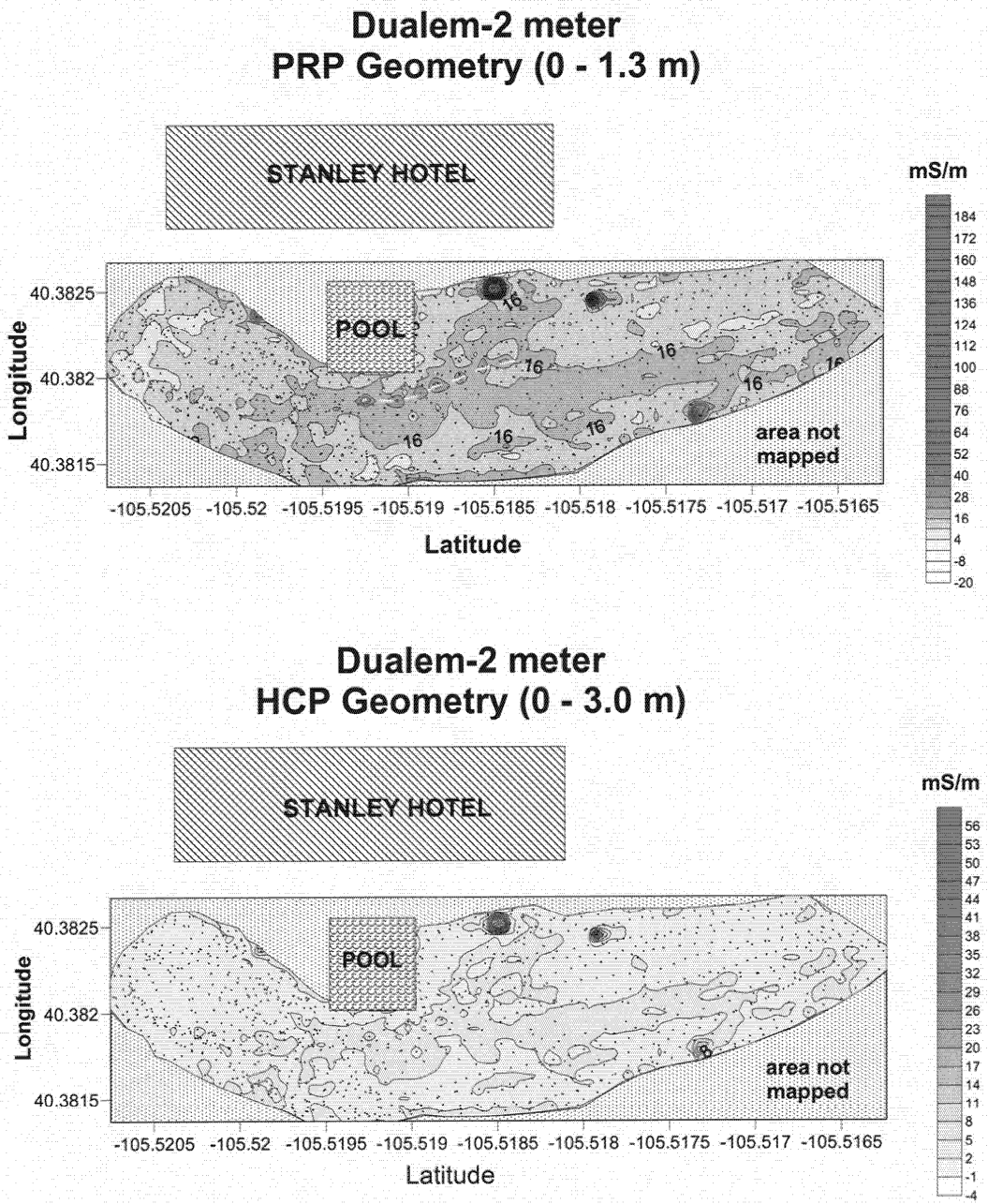

Figure 2 – Spatial pattern of apparent conductivity measured with the Dualem-2 meter in the PRP and HCP geometries in an area of Cathedral-Ratake complex, 5 to 15 % slopes near the Stanley Hotel, located in Estes Park, CO.

GPR Survey

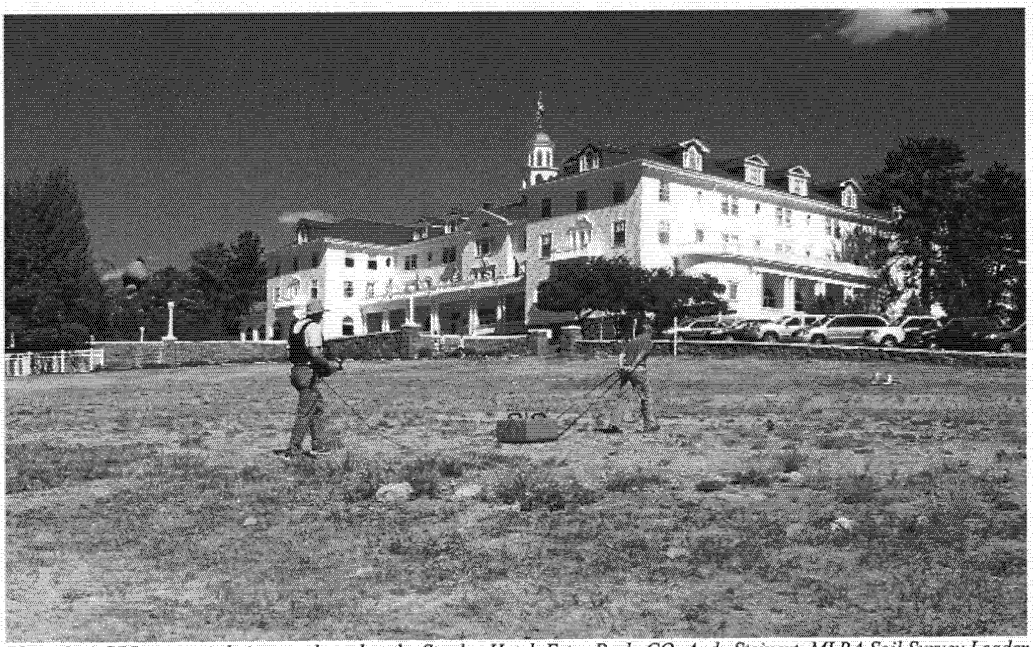

Photo 3. A GPR survey is being conducted at the Stanley Hotel, Estes Park, CO. Andy Steinert, MLRA Soil Survey Leader (USDA/NRCS) pulls the 200 MHz antenna at a consistent pace across the survey area while Wes Tuttle, Soil Scientist (Geophysical), (USDA-NRCS-NSSC) reviews ground penetrating radar (GPR) survey data. GPR surveys usually require at least two people, one person to pull the antenna and another person to collect and record the data.

Results: Stanley Hotel

A GPR survey was conducted in an area of Cathedral-Ratake complex, 5 to 15 % slopes. The majority of the radar records obtained with the 200 and 400 MHz antenna near the Stanley Hotel were of marginal to poor interpretative quality (Refer to *Figures 3 and 4*.). High rates of signal attenuation (signal scatter) significantly limited observation depths and overall effectiveness of GPR at the site. The 400 MHz antenna appeared to experience more scattering loss than the 200 MHz antenna. Poor resolution and inconsistency of intelligible subsurface features in radar records resulted in very little interpretive information concerning subsurface soil features. The high amplitude signal (hyperbolic feature) observed below **A** in *Figure 3* is thought to be associated with an underground utility line. The object was contrasting to the surrounding soil material and produced a good reflection. A subtle feature associated with soil/bedrock stratigraphy can be observed below **B** (*Figure 3*). Parallel bands of noise (high rates of signal attenuation) can be observed before and after the subtle feature (below **B)** and make interpretations in this area difficult.

Results: MacGregor Ranch

A GPR survey was conducted in an area of Cathedral-Ratake complex, 5 to 15 % slopes, Cathedral-Ratake complex, 15 to 35 % slopes and Lobe-Breezebasin complex, 0 to 5 % slopes at the MacGregor Ranch located approximately 3 miles north-northeast of Estes Park, CO. The very deep, poorly drained Lobe soils formed in alluvium derived from mixed sources on flood plains. Lobe is a member of the fine-loamy, mixed, superactive, frigid Cumulic Endoaquolls family. The very deep, moderately well drained Breezebasin soils formed in mixed alluvium on flood plains and flood plain steps. Breezebasin is a member of the fine-loamy, mixed, superactive, frigid Cumulic Haplustolls family.

The results of the GPR survey conducted at the MacGregor Ranch were similar to the results observed at the Stanley Hotel. The inconsistent occurrence pattern and poor resolution of subsurface features in radar records made interpretations less than desired and unreliable in most areas (refer to *Figure 4*). The majority of the radar records obtained were of poor interpretative quality. High rates of signal attenuation and signal scatter significantly limited observation depths and overall effectiveness of GPR at the site. Interpretations improved slightly near small drainageways containing coarser textured soil material and near rock outcrops.

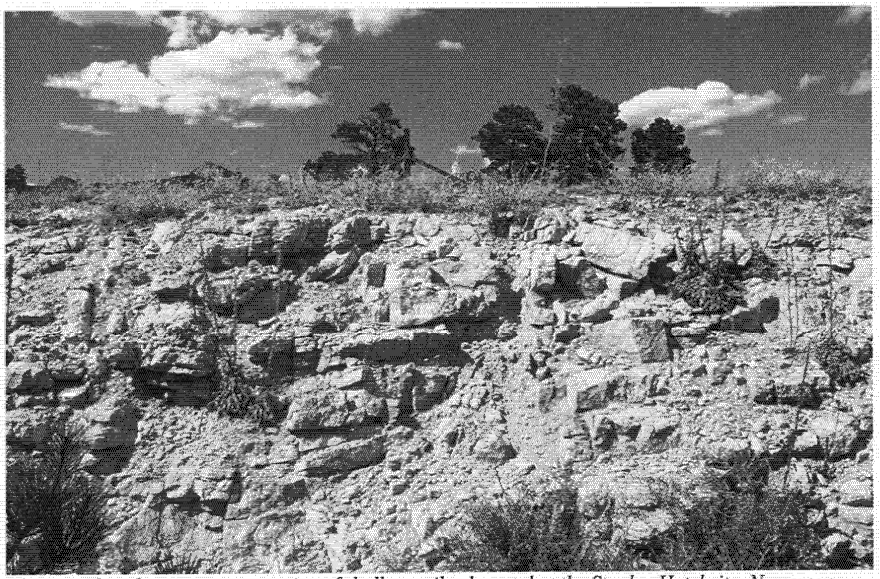

Photo 4. This photo is representative of shallow soils observed at the Stanley Hotel site. Numerous soil borings revealed depth to bedrock dominantly at depths less than 50 cm in the area in front of the Stanley Hotel.

GPR summary:

Even though interpretations were limited at the two sites surveyed with GPR, a combination of soil borings and radar records did reveal shallower depths to bedrock than originally thought. The dominant soils at the two sites were originally thought to be moderately deep to bedrock (50 cm to 100 cm). A significant component of soils containing shallow depths to bedrock (< 50 cm) was observed within the map unit.

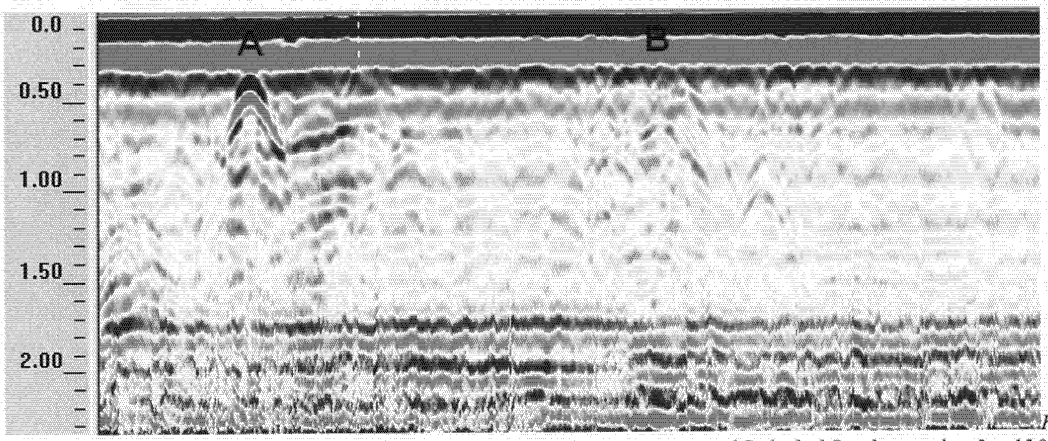

Figure 3. A representative radar record collected with the 400 MHz antenna in an area of Cathedral-Ratake complex, 5 to 15 % slopes near the Stanley Hotel.

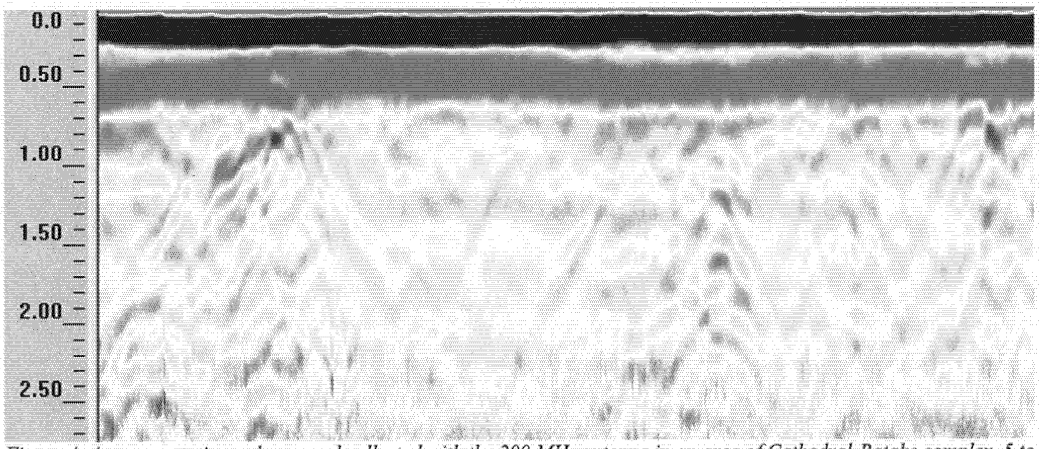

Figure 4. A representative radar record collected with the 200 MHz antenna in an area of Cathedral-Ratake complex, 5 to 15 % slopes at the MacGregor Ranch.

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