

## NATURAL ENERGY RESOURCES COMPANY

P.O. Box 567 • Palmer Lake, Colorado 80133  
719-481-2003 • fax 719-481-3452  
centralcoloradoproject@comcast.net  
www.centralcoloradoproject.us

**October 15, 2012**

**Commissioner Michael Connor  
U. S. Bureau of Reclamation  
1849 C Street, NW  
Washington, D. C. 20240**

**Lt. General Thomas Bostick  
U. S. Army Corps of Engineers  
441 G Street, NW  
Washington, D. C. 20314**

**Subject: Evaluation of Central Colorado Project (CCP) for western water & energy needs**

**Dear Commissioner Connor and General Bostick:**

Natural Energy's September 12, 2012 letter to President Obama and Governor Hickenlooper describes how federal, state, and local leaders are violating national environmental laws by ignoring Central Colorado Project's innovative solutions for western water and energy needs.

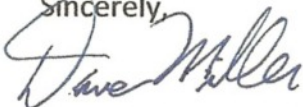
The enclosed Central Colorado Project White Paper, Professional References, and U. S. Patent Abstract provide good summaries of CCP's breakthrough high altitude pumped storage capabilities. CCP is designed to selectively integrate and multiply the reliability and productivity of limited water and energy resources throughout five Southwestern river basins and the western power grid. Modeling can confirm CCP's expected benefit-cost ratio is higher than 10 to 1. The industry's norm for water projects is 2 to 1. Public safety is also enhanced.

Several of your NEPA compliance officials have advised that the Bureau's Denver Office and the Corps' Sacramento Office have advanced planning functions that could preliminarily evaluate CCP's unprecedented solutions for our nation's clean water and energy shortage crises.

The Bureau's overlooked Upper Gunnison Aspinall Pool Transmountain Studies and Natural Energy's detailed Feasibility Level Geological, Geotechnical, and Stability Investigations for Union Park Dam provide good starting points for your vital CCP scoping evaluations.

Natural Energy is looking forward to working closely and sharing its proprietary rights with all stakeholders involved with the evaluation and development of Central Colorado Project's game changing solutions for western water and energy needs. Thank you, and please advise.

Sincerely,



Dave Miller, President

Encls: CCP White Paper & Prof. Refs., 4-19-07; U. S. Patent Abstract, 1-11-11; Profile, 2-12-08.  
cc: The White House; CEQ Chair Sudley; Secretary Salazar; Secretary Vilsack; Secretary Chu;  
EPA Administrator Jackson; Gov. Hickenlooper; Western Governors; selected leaders.

PATENT PENDING

SYSTEM AND METHOD FOR SELECTIVELY DIVERTING WATER AND  
PROVIDING PEAK HYDROELECTRIC POWER

# CENTRAL COLORADO PROJECT (CCP)

## Western Renewable Energy & Water Productivity Multiplier

### WHITE PAPER

by Dave Miller, President  
Natural Energy Resources Company  
P.O. Box 567  
Palmer Lake, Colorado 80133  
(719) 481-2003, Fax (719) 481-3452

April 19, 2007

### EXECUTIVE SUMMARY

Our Nation's growing Western Region has an escalating renewable energy and water shortage crisis. This paper, for the first time, fully reveals how the innovative Central Colorado Project (CCP) can soon solve a significant portion of this seemingly intractable crisis. CCP's unique concept employs a single high altitude regulating reservoir to multiply the productivity of renewable energy and water resources and systems throughout the Southwestern Region's major river basins on both sides of the Continental Divide. CCP's regional high storage concept for enhanced energy and water productivity has significant worldwide potential for human and environmental needs.

### HISTORICAL PERSPECTIVES

Naturalists understand that high-altitude beaver dams have protected and enhanced Western river valleys and environments for thousands of years. Hydrologists also recognize that headwater reservoirs have multiple use and reuse advantages for entire river systems over comparable down river storage facilities. Unfortunately, the latent economic and environmental advantages of headwater reservoirs have never been recognized and applied in Western water development doctrine or practice.

Institutional barriers and technical constraints have worked against regional water resources planning with high-altitude pumped-storage. As a result, most Western dams are located down-river in low and medium -altitude sites. These traditional dams on rivers, have limited socio-economic benefits, cause serious environmental impacts, and suffer excessive evaporation losses. They are also largely responsible for our Nation's thirty-year "green movement" against new water storage projects. Central Colorado Project's high-

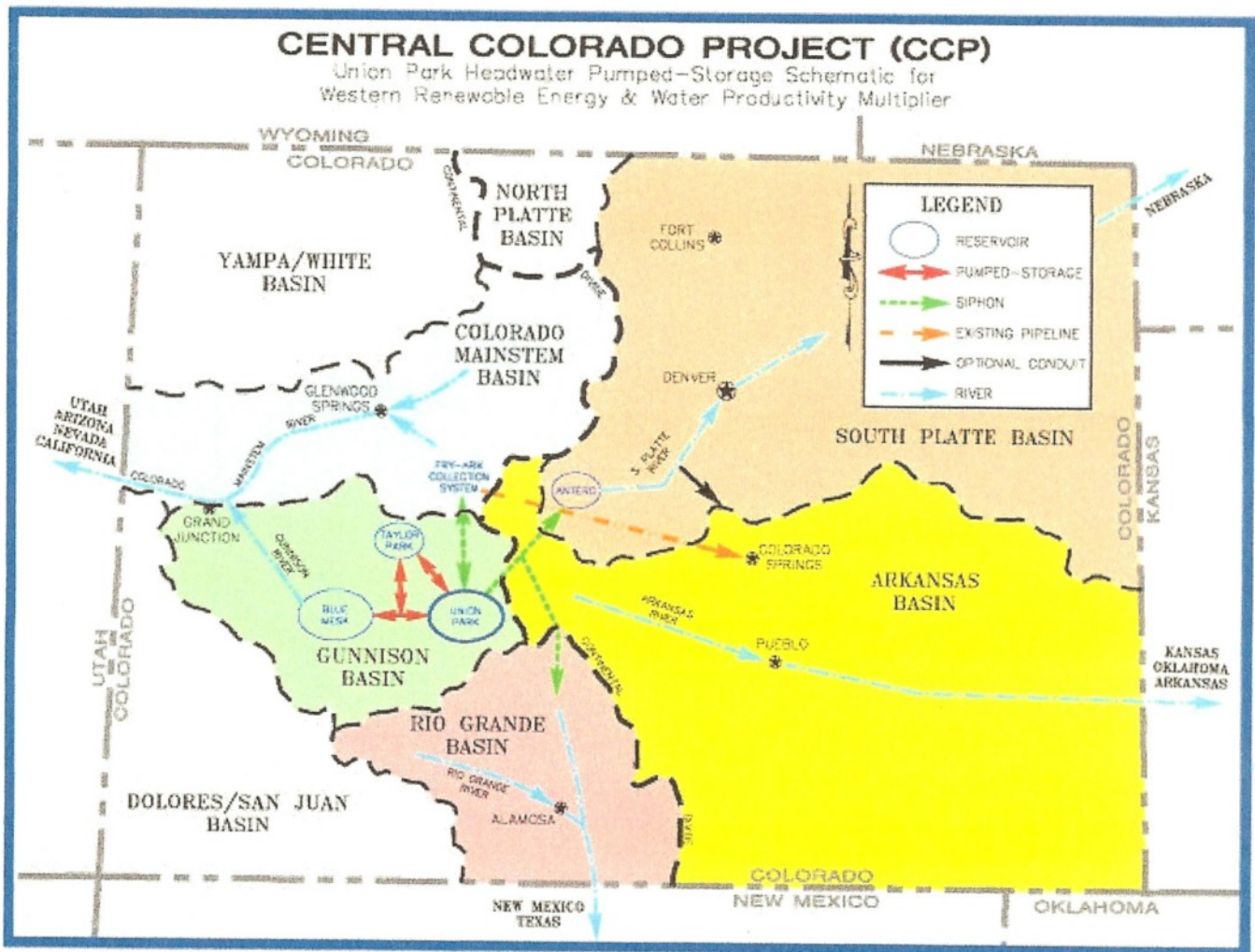


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altitude, off-river, pumped-storage concept is an environmental and economic breakthrough for the Western Region's vital renewable energy and water supply industries.

**KEY FEATURES**

Union Park Reservoir, to be located off-river near the Continental Divide in Gunnison National Forest, is a key feature of CCP's advanced Western energy and water conservation concept. Recent "Feasibility Level Geological and Geotechnical Investigations, and Preliminary Design Studies for Union Park Dam" [1, 2] confirmed that this 575-foot-high structure can safely store up to 1.2 million acre-feet of water (Colorado's largest reservoir) for the region's highest priority energy and water needs. Construction of Union Park's modern roller compacted concrete (RCC) dam can be completed in approximately 18 months. The dam's estimated construction cost is 395 million dollars, which is only 330 dollars per acre-foot of multi-purpose storage.



Union Park Reservoir will employ a 42- mile inverted gravity siphon to augment the South Platte and Arkansas River Basins, when necessary, for high priority human and environmental needs. A Poncha Pass Branch of this siphon will augment the Rio Grande Basin, when needed, for similar priority purposes. A reversible lateral siphon will



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interconnect Union Park Reservoir with the Bureau of Reclamation's existing Fryingpan-Arkansas Upper Colorado River Collection System, for enhanced flood and drought protection throughout east and west sides of the Continental Divide. An optional South Platte-Palmer Divide gravity conduit can efficiently serve central Front Range and Colorado Springs needs.

## ENERGY MULTIPLIER VALUES

CCP's large off-channel Union Park reservoir, located at 10,120 feet altitude, will be filled via high-capacity reversible pump generators from the Bureau's existing Blue Mesa and Taylor Park Reservoirs, located at 7,393 and 9,319 feet. This filling operation will occur during heavy spring snowmelt months, when surplus energy and flood waters are abundantly available for high-altitude pumped-storage. Union Park's large energy storage capability converts surplus, and currently wasted, base power from coal, nuclear, hydro, solar, and wind generation facilities into instantly available peaking power for the Western Power Grid. Back-up peaking power is essential to prevent regional brown and blackouts during high demand summer cooling and winter heating months. Reliable peaking power can have system-wide values up to ten times regular base power values.

Managed water releases and dependable river flows from Union Park's flexible high-altitude storage site can also substantially increase hydro-power yields from existing down-river dams throughout the Gunnison, Colorado, Platte, Arkansas, and Rio Grande River Basins. Some of the smaller down-river dams, that are not equipped with hydro-power, can be economically upgraded to provide clean renewable energy, after CCP's optimized multi-river regulating capabilities are implemented. Revenues from CCP's unique regional energy multiplier capabilities will cover a large portion of the project's construction and operating costs for regional water multiplier capabilities.

## WATER MULTIPLIER VALUES

CCP's single high-altitude Union Park Reservoir and advanced pumped-storage operation can regulate and multiply water resource benefits throughout the Southwestern Region's five largest river basins. Specifically, CCP's flexible river augmentation capabilities can assure the following real time benefits for Colorado and its eleven down river states (Utah, Arizona, Nevada, California, New Mexico, Texas, Kansas, Oklahoma, Arkansas, Nebraska, and Wyoming):

- Managed gravity augmentations from CCP's strategic high-altitude storage site will automatically integrate and substantially increase the reliability, productivity, and quality of existing developed water rights and storage systems throughout the Gunnison, Colorado, Platte, Arkansas, and Rio Grande River Basins;
- Captured snowmelt and timely releases from Union Park's high storage can balance, protect, and optimize regional river flows, reservoir levels, and water quality under unpredictable and highly variable flood and drought conditions;



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- CCP's newly developed Colorado River Compact entitlements can conserve and optimize use of damaging spring flood flows for Upper Gunnison Basin-of-origin needs. These local needs include flood control, and optimized river flows for droughts, growth, irrigation, and recreation;
- CCP will provide managed optimal flows for Black Canyon of the Gunnison National Park and the Colorado River Endangered Fish Recovery Program. Lake Union Park can also become a world destination Lake Trout fishery;
- Water productivity multipliers from CCP can reverse regional water shortages from urban growth, which are escalating loss of irrigated Western farms and green valleys;
- CCP's integrated regional capabilities obviate current local proposals to develop non-integrated Colorado conditional use and reuse water rights, that would excessively deplete West and East Slope rivers to less than 50% of historic native flows;
- During long wet cycles, CCP's pumped-storage infrastructure can be used to recharge declining Western ground water reserves, including the vital Ogallala, Denver, and San Luis aquifers;
- CCP's high-altitude pumped-storage concept can reduce regional evaporation losses. For example, projected annual evaporation from the largely frozen 7.8 square mile surface of Lake Union Park is about 1½ feet vs. up to 7 feet from hot desert storage sites. The West is losing a large portion of its finite renewable water supplies to evaporation from low-altitude reservoirs;
- CCP's high storage and responsive water regulation capabilities can be used by Colorado and down river states to assure equitable development and maximum productivity from their respective interstate compact entitlements. Snowmelt and rain from Colorado's high mountain terrain generates a large portion of all renewable waters that flow in the Southwestern Region's five major river systems. All down-river states can gain from CCP's flexible headwater storage in Colorado;
- Water conservation, productivity, and regulating advancements from CCP can offset potential adverse impacts from global warming, while reducing long-term renewable energy and water costs for Western consumers.

## FLOOD AND PUBLIC SAFETY BENEFITS

Recent Department of Interior and Bureau of Reclamation dam safety studies [3, 4, 5] predict Taylor Park, Blue Mesa, and Pueblo Dams could suddenly fail with floods above 55% of the projected Probable Maximum Flood (PMF). In addition to the high hydrologic or flood failure risk (inadequate spillway capacity and possible overtopping of the structure), Taylor Park Dam may also fail during a moderate seismic event that could liquefy materials in the embankment or foundation. Considering the hazards at all three dam locations, an estimated 16,000 lives are currently at risk. The above referenced "Feasibility Level Geological and Geotechnical Investigations, and Preliminary Design Studies for Union



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Park Dam” confirmed Union Park Dam will not require an emergency spillway for floods, because of the reservoir’s small 26-square mile-upstream drainage area and the dam’s large freeboard capacity. Furthermore, the seismic stability of Union Park Dam is considerably increased because the dam is designed as a massive concrete gravity structure resting on a foundation of competent granitic rock. These studies also indicate Union Park’s high-volume pumping capabilities and large storage capacity can be operated to greatly reduce catastrophic Flood-Failure risks from these major Bureau reservoirs. CCP’s flood protection and public safety values for vulnerable down stream federal dams are unique in the water development industry.

### CONGRESSIONAL MANDATE

Congress authorized construction of the Bureau’s Aspinall Reservoirs (Blue Mesa, Morrow Point, and Crystal) in 1956 to primarily help Colorado develop about a third of its remaining unused Colorado River Compact entitlements for local and statewide consumptive needs. Colorado subsequently granted the Bureau its 300,000 acre-feet Aspinall Marketable Pool Water Right for that specific purpose. Revenues from long-term Aspinall Pool water service contracts were intended as user repayments for Congress’s original Aspinall Project construction authorization. A recent Colorado Supreme Court ruling confirmed the Bureau’s unused Aspinall Pool Rights are still available for contracting and upstream development for local and statewide consumptive needs.

All Upper Colorado River trans-mountain diversions are from Colorado’s Main-Stem Basin tributaries. Colorado’s wetter untapped Gunnison Basin Branch of the Colorado River still has most of its original average annual native outflows at Grand Junction. The Gunnison River and the Bureau’s available Aspinall storage and Aspinall Pool Rights provide a large dependable water source for new high-altitude storage. CCP will finally fulfill Congress’s 1956 regional water development and repayment mandates for Colorado and the Bureau of Reclamation. CCP’s energy and water productivity multipliers for our Nation’s Western and Southwestern Regions are an unprecedented added bonus.

### OWNERSHIP AND CONTROL

Participating energy and water providers can cooperatively own, finance, and operate CCP with a Central Colorado Project Authority (CCPA), for mutual benefits of local and regional stakeholders. Farm and environmental associations, as well as down river states, may be represented on CCPA’s Board and operational management team. CCP’s complex energy/water storage and distribution decisions can be optimized with computers and real time flood, normal, and drought flow data from ground and satellite reporting stations.

### EXPECTED BENEFIT- COST RATIO

A farsighted team of energy, water, and environmental planning experts can employ advanced computer simulation techniques to quickly confirm CCP’s preliminary expected benefit-cost ratio of at least 10 to 1. Most traditional Western storage projects on rivers were built with 2 to 1 benefit-cost expectations. The National Environmental Policy Act



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(NEPA) requires objective economic and environmental comparisons of all reasonable alternatives. Preliminary quantification of CCP's unique regional energy and water multiplier values will greatly simplify NEPA scoping comparisons with those other non-integrated local alternatives, currently being considered.

## CONCLUSION

CCP's innovative high-altitude pumped-storage concept can substantially increase the productivity and quality of finite renewable Western energy and water resources throughout the new millennium. Western consumers and environments will realize unprecedented benefits from CCP. Historically competing stakeholders now have strong economic and environmental incentives, to unite behind emergency development of Central Colorado Project for current and future generations. Union Park is the world's only headwater conservation site that can provide epic enhancements for natural and human needs throughout five arid and semi-arid river basins.

### References to Professional Papers and Reports:

- [1] Feasibility Level Geological and Geotechnical Investigation for Union Park Dam by Horst Ueblacker, P.E., *UEBLACKER ASSOCIATES* ([www.ueblacker.us](http://www.ueblacker.us)): Proceedings 41<sup>st</sup> U.S. Symposium on Rock Mechanics, Paper ARMA/USRMS 06-960, June 17-21, 2006, Golden, Colorado, 28 pages, 30 references;
- [2] Feasibility Study and Preliminary Design of Union Park Dam by Horst Ueblacker, P.E., *UEBLACKER ASSOCIATES* ([www.ueblacker.us](http://www.ueblacker.us)): Proceedings 26th United States Society on Dams (USSD) Annual Meeting and Conference, May 1-5, 2006, San Antonio, Texas, 32 pages, 29 references;
- [3] Safety Evaluation of Existing Dams Analysis Summary (SEED Analysis Summary) TAYLOR PARK DAM. Prepared by Becky Morfitt, Lead Branch Coordinator, U.S. Department of the Interior Bureau of Reclamation, Denver, Colorado, November 27, 1989, (Library Document TC 557.C6 T39s 1999);
- [4] Report of Findings of the Issue Evaluation, TAYLOR PARK DAM Uncompahgre Project. U.S. Department of the Interior Bureau of Reclamation Technical Service Center, Denver, Colorado: Technical Memorandum No. TL-8312-4, March 2002 (Library Document TC 557.C6 T39 M35 2002);
- [5] PUEBLO DAM – RISK ANALYSIS Modified Dam Including Contraction Joint Leakage and Concrete Dam Tension Issues. Prepared by Mark Steers and John Trojanowski, U.S. Department of the Interior Bureau of Reclamation Technical Service Center, Denver, Colorado, July 2000.



US007866919B2

(12) **United States Patent**  
Miller

(10) **Patent No.:** US 7,866,919 B2  
(45) **Date of Patent:** Jan. 11, 2011

(54) **SYSTEM AND METHOD FOR CONTROLLING WATER FLOW BETWEEN MULTIPLE RESERVOIRS OF A RENEWABLE WATER AND ENERGY SYSTEM**

4,159,188 A 6/1979 Atencio  
4,192,627 A 3/1980 Casehow

(75) **Inventor:** Allen David Miller, Palmer Lake, CO (US)

(Continued)

**FOREIGN PATENT DOCUMENTS**

(73) **Assignee:** Natural Energy Resources Company, Palmer Lake, CO (US)

JP 57-131869 8/1982

(\* ) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 295 days.

(Continued)

**OTHER PUBLICATIONS**

(21) **Appl. No.:** 12/102,651

"Blenheim-Gilboa Pumped Storage Power Project," available at <http://www.nypa.gov/facilities/blengil.htm>, printed Jul. 13, 2010, copyright 1996-2010, 2 pages.

(22) **Filed:** Apr. 14, 2008

(65) **Prior Publication Data**  
US 2008/0253837 A1 Oct. 16, 2008

*Primary Examiner*—Tara Mayo-Pinnock  
(74) *Attorney, Agent, or Firm*—Sheridan Ross P.C.

**Related U.S. Application Data**

(57) **ABSTRACT**

(60) Provisional application No. 60/911,451, filed on Apr. 12, 2007.

(51) **Int. Cl.**  
E02B 9/02 (2006.01)  
E02B 13/00 (2006.01)

(52) **U.S. Cl.** ..... 405/80; 405/51; 405/53; 405/75

(58) **Field of Classification Search** ..... 405/36, 405/51-53, 55, 75, 80; 210/747, 170.01  
See application file for complete search history.

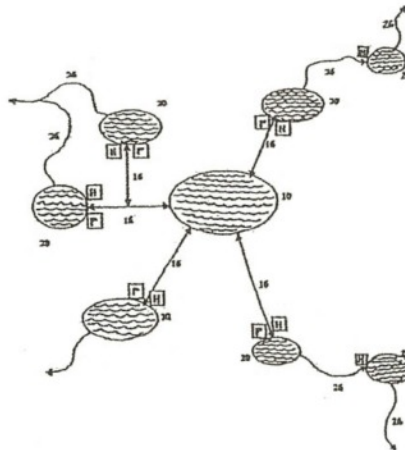
A high altitude pumped-storage system for selectively integrating, storing, and distributing water and energy to increase the regional productivity of existing and future water and energy resources throughout multiple river basins is disclosed. This system addresses in part the increased requirement of supplying energy demands from a renewable energy source, such as wind, solar, or water generated power. The system includes at least one primary reservoir connected to multiple secondary reservoirs by conduits. The system allows for selectively distributing water and energy between secondary reservoirs and at least one primary reservoir. The system may comprise one or more hydroelectric power generation facilities. A method for increasing the regional efficiency of existing and future systems for producing, storing, and delivering energy from sources such as hydroelectric, wind and solar power from the water collected by the system described herein is also disclosed.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

2,962,599 A 11/1960 Pirkey  
3,863,605 A \* 2/1975 Gallup ..... 119/229  
3,939,356 A 2/1976 Loane  
4,109,160 A 8/1978 Goto et al.  
4,117,685 A \* 10/1978 Skaike ..... 405/36  
4,132,901 A 1/1979 Crausbay

16 Claims, 4 Drawing Sheets





## WATER & ENERGY PROFILE

Dave Miller, President & Chairman  
Natural Energy Resources Company  
P.O. Box 567, Palmer Lake, CO 80133  
719-481-2003, Fax 719-481-3452  
[centralcoloradoproject@comcast.net](mailto:centralcoloradoproject@comcast.net)

**Preface** This personal background profile is for persons interested in Dave Miller's breakthrough Central Colorado Project (CCP) high altitude pumped-storage concept for regional water, energy, and climate change needs.

**Formal Education** BS Degree, Business Management, University of Colorado, 1954; MS Degree, Transportation Management, University of Tennessee, 1962; Distinguished Graduate, Air Force Command and Staff College, 1967.

**Military Innovations** During twenty-year Air Force career, was responsible for the following significant innovations for military logistics and international commerce;

- Key planner for development of universal cargo handling system to support rapid worldwide deployments and re-supply of military forces by air transportation;
- Conceived the Speed Load System used to re-supply troops by tactical airlift, while under fire in combat;
- Authored Master's Thesis at University of Tennessee, which warned against excessive deregulation of the airline industry, and the serious problems currently being experienced;
- Conceived and authored White Paper at Air Command and Staff College on an advanced shipment tracking and control concept that became the forerunner for today's global express industry;
- Served as a Department of Defense representative on the International Inter-Model Containerization Committee, which set international standards and procedures that have multiplied the global productivity of land, sea, and air transportation systems;
- Was promoted in advance of most contemporaries through all grades to Colonel, because of visionary leadership roles with major logistical innovations;
- Recipient of the Legion of Merit, Meritorious Service, and Commendation Medals. Also awarded six Air Medals for combat landings and re-supply work under fire at remote Viet Nam outposts;
- Voluntarily retired from military in 1974, after twenty years of service, to pursue public and private interests.



## Civilian Innovations

- After selling and then owning farms and ranches, became interested in innovative concepts to solve escalating regional water, energy, drought, growth, land use, and environmental problems. This regional outlook led to an ownership position in Natural Energy Resources Company in 1984. Subsequently, elected as company President and Chairman in 1986.
- After appointment as President, Natural Energy's objectives changed from development of peaking power for the western power grid to development of renewable water and energy resources for both sides of the Divide;
- During 1988, Natural Energy sold its proposed Union Park Transmountain Project to Arapahoe County;
- After a futile twelve year effort to obtain a new water right for Union Park, Arapahoe reassigned all of its original project rights back to Natural Energy during 2001;
- Since 2001, Natural Energy has been working on the breakthrough Central Colorado Project (CCP) concept. CCP will use the Bureau of Reclamation's existing Aspinall Marketable Pool Water Right for statewide consumptive needs as intended by Congress in the 1956 Colorado River Storage Project Act (CRSPA);
- CCP can pump-store currently wasted spring floodwaters at high altitude, as well as unused renewable and non-renewable energy from the western power grid. These conserved resources can then be selectively used to optimize and multiply the productivity of existing water and energy systems throughout the Gunnison, Colorado, Platte, Arkansas, and Rio Grande River Basins;
- Natural Energy's innovative water and energy productivity multiplier concept for regional droughts, growth, and climate change needs was first revealed in a Central Colorado Project White Paper dated April 2007. Natural Energy also simultaneously filed a U.S. Patent Application for CCP's unprecedented regional concept;
- Natural Energy's current objective is to have its breakthrough Central Colorado Project developed as a high priority regional model for solving some of the world's most pressing human and environmental problems.

*Natural Energy Resources Company is a private firm founded in 1982 by Marvin Greer, who was the retired Bureau of Reclamation's Chief Engineer for the Colorado Big Thompson Project (CBT). Natural Energy owners are primarily engineers, geologists, farmers, and their families who were and are familiar with CBT values for Colorado.*