



loam, resting on a clay subsoil, easy to break and cultivate.

The land lies very smooth, and is remarkable for its gentle and even slope south and southeast, of from ten to twenty feet per mile, rendering it susceptible of the most complete and economical irrigation.

The climate is uniform, and in that low altitude, 3,000 to 4,000 feet, the growing seasons are longer than in northern Colorado.

## RAILROADS AND MARKETS.

The main line of the Missouri Pacific and Santa Fe railways cross Otero County from east to west; the former line passing through the center of the Company land, and the other bounding it on the south. The products of these lands are, within two hours after shipment, placed by these roads in Pueblo, and within six hours, in Denver.

These lands may be reached from any part of the United States by either the Missouri Pacific or the Atchison, Topeka and Santa Fe Railways.

## THE WATER SUPPLY

Is abundant and reliable, being from the great Bob Creek Canal, and taken from the Arkansas River. This river has a supply *ten times greater than the South Platte River*, as shown by measurements of the State Engineer (see Report 1887-88), and its water is not yet all appropriated.

The priority of this canal dates back to April 10, 1889, prior to the construction of other large canals from that stream.

The Company has also an extensive system of storage reservoirs, thus securing the delivery of water outside of the ordinary irrigation season. No objection will be made to the interchange of water for irrigation, by parties owning full water rights for their land.

## LAND AND WATER. PRICES, TERMS.

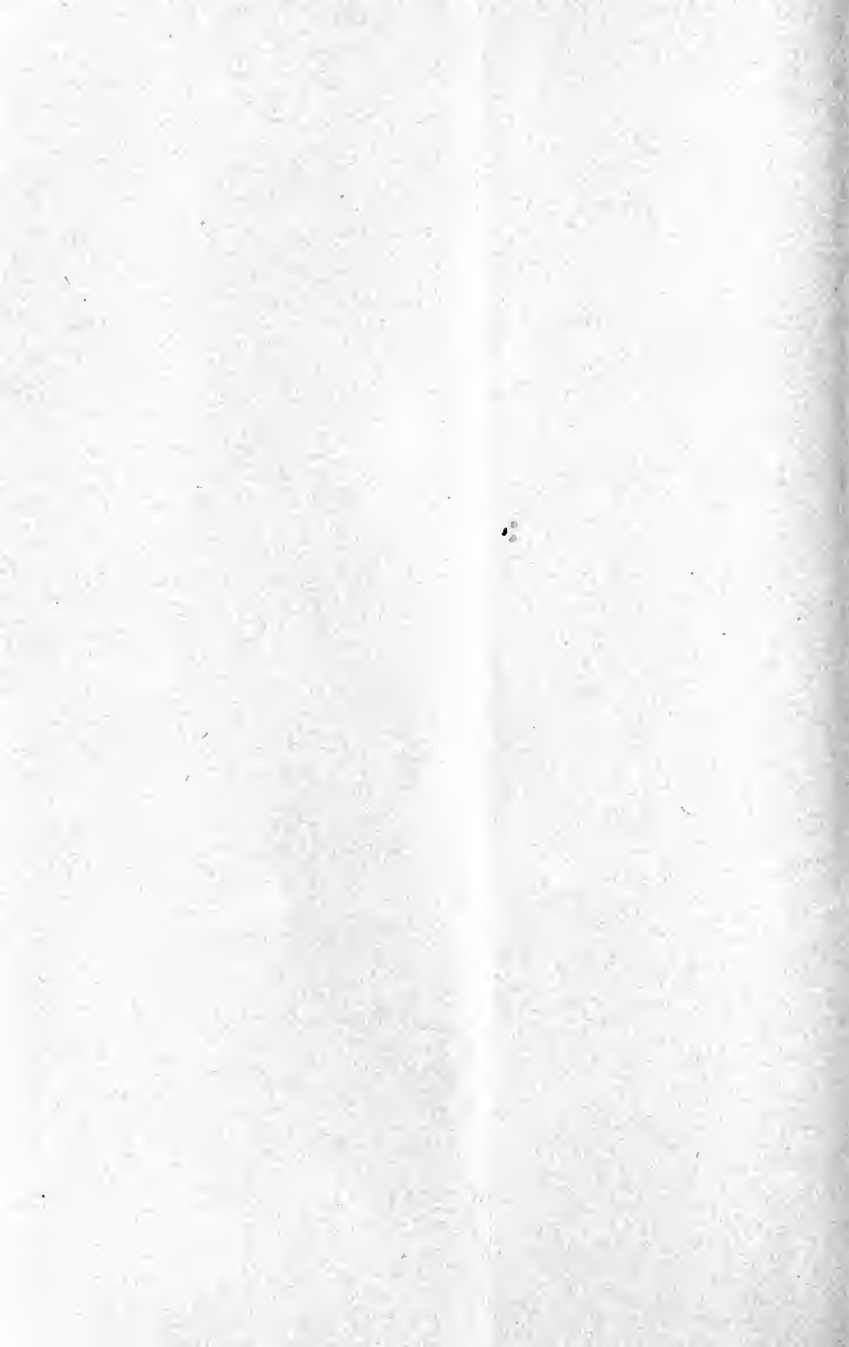
The Colorado Land and Water Company has limited its sales and leases for 1891, to 30,000 acres; of which amount over one-half has already been disposed of, and is now being rapidly improved. The balance is now offered to actual settlers on liberal terms, at the low price of from \$5.00 to \$10.00 per acre, with full paid, perpetual water rights, at \$800.00

# PROSPECTUS

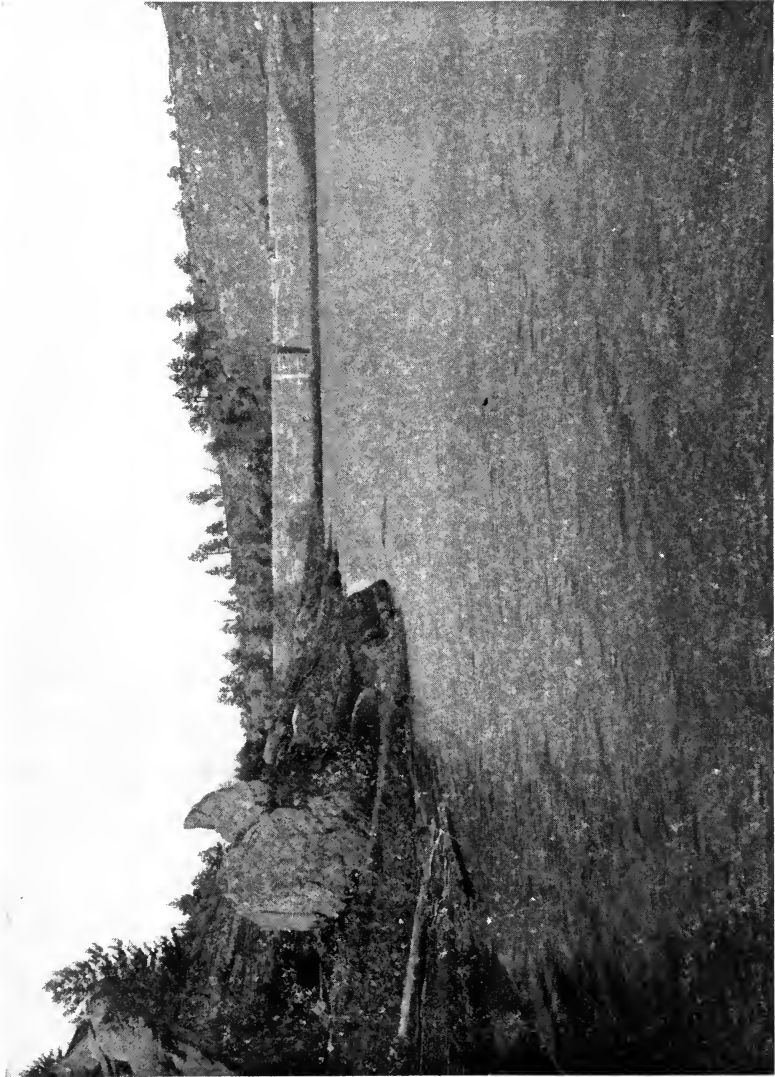
The Denver  
Land and Water Storage Company  
Denver, Colorado

Owners of

- Irrigated Land
- The Clark Colonies
- The Arapahoe Canal
- Reservoir Water Rights
- Castlewood Lake
- The Middletown Quarries



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CASTLEWOOD LAKE, SHOWING DAM.  
PROPERTY OF THE DENVER LAND AND WATER STORAGE CO.

# THE DENVER LAND AND WATER STORAGE CO.

INCORPORATED UNDER THE LAWS OF  
THE STATE OF COLORADO.

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CAPITAL STOCK, \$2,500,000

OF WHICH \$500,000 IS FOR THE PURPOSES OF MAKING ADDITIONS  
TO THE COMPANY'S PROPERTY, AND FOR PURCHASING  
AND RETIRING OUTSTANDING BONDS.

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GENERAL MORTGAGE THIRTY-YEAR SIX PER CENT.  
GOLD SINKING FUND BONDS.

AUTHORIZED ISSUE . . . . .	\$800,000
OUTSTANDING TO DATE . . . . .	600,000
REMAINING IN COMPANY'S TREASURY . . . . .	200,000

*DIRECTORS.*

RUFUS CLARK, Capitalist . . . . . DENVER, COLO.  
W. E. ALEXANDER, Secretary and General Manager . DENVER, COLO.  
F. C. FISCHER, Chicago Lumber Co., Treasurer . . DENVER, COLO.  
ALFRED P. BOLLER, C.E., 71 Broadway . . . . . NEW YORK CITY.  
CHARLES E. DUSTIN, Prest. Schuyler Electric Co.,  
Vice-President . . . . . HARTFORD, CONN.  
CHARLES E. JACKSON, Vice-President Middlesex  
Banking Co. . . . . MIDDLETOWN, CONN.  
CARLISLE N. GREIG President.

*TRUSTEE.*

THE STATE TRUST CO., 50 Wall Street . . . . . NEW YORK CITY.

*BANKERS.*

THE COLORADO NATIONAL BANK . . . . . DENVER, COLO.

*CHIEF ENGINEER.*

A. M. WELLES, C.E. . . . . DENVER, COLO.

*ASSOCIATE ENGINEER.*

H. A. WOODS, C.E. . . . . DENVER, COLO.

*CONSULTING ENGINEER.*

A. P. BOLLER, C.E. . . . . NEW YORK.

*COMPANY'S OFFICES.*

1650 CHAMPA STREET, DENVER, COLO.

45 BROADWAY, NEW YORK.





# THE DENVER LAND AND WATER STORAGE COMPANY.

DENVER, August 8, 1891.

**The Company.**—The Denver Land & Water Storage Company was formed April 8, 1891, to take over the property and assets of The Denver-Arapahoe Land Company and The Denver Water Storage Company. Its Articles of Incorporation are very comprehensive in their character, enabling the Company to buy and sell land; transact the general business of a water company; buy and sell mortgages, debentures, etc. In addition to the certificate of their own counsel, an opinion as to the legality of their organization can be furnished from Hon. A. B. Pattison, recently a member of the Supreme Court Commission of the State of Colorado.

**The Company's Property.**—This corporation owns 17,700 acres of land, much of which is immediately adjoining the platted additions to the city of Denver; Castlewood Lake (their main reservoir), the largest body of water of artificial creation in the State; Castlewood Dam; the Arapahoe Canal and Laterals therefrom—about eighty miles of construction; the Clark Reservoir, already (practically) completed; three other reservoirs, either surveyed or contemplated; stone quarries; fire clay, etc.

**Land.**—The Company owns one group of about twenty-six sections of land in the Counties of Arapahoe and Douglas, and another tract of 1,180 acres in Douglas County, some thirty miles south of Denver. In this great domain, almost every conceivable

variety of land and soil is included—upland; lowland; sunny slopes admirably adapted for vineyards; level tracts within three miles of the University Electric Line which are being purchased by fruit-growers and market gardeners; superb villa sites fringing the picturesque banks of Castlewood Lake; larger tracts, more remote from Denver, for dairy and farming purposes; deposits of clay, which make a perfect terra-cotta building material without artificial coloring or aid, and a very considerable acreage of the lava building stone with which many of Denver's finest residences are built.

This land is all fenced, much of it is cross-fenced, and there is absolutely "no waste land in the property." It has been appraised by many competent experts, but the Company's own operations are the best standard of value, and their *sales to date* prove that they will certainly realize an average price of \$200 per acre, or considerably over \$3,000,000 for their land alone, which is only one of their sources of income.

The nearest sections of this land are just seven miles from Colfax Avenue and the centre of the city, but only three miles from the built-up and occupied portions of this beautiful and growing city, and it extends thence, in alternate sections, southward for twelve miles more.

The Company has arranged to place four sections, or 2,560 acres, under immediate cultivation through their Clark Colony plan. This will give them from \$200 to \$300 an acre for their land (from the results of cultivation paid for by others) and add immensely to the value of their remaining land by demonstrating its productive value and large income-paying capacity.

The capabilities of Colorado soil, where properly cultivated, have been fully tested by annual experiments at the State Agricultural College. The maximum results have been as follows: Wheat, 91 bushels; field crop: largest yield of rye, 52 bushels; oats, 102 bushels; potatoes, over 400 bushels to the acre; barley, 72 bushels; corn (shelled) has been made to yield 67 bushels.

**The Company's Water Plant** is the finest reservoir, water storage, and distribution plant for irrigation, power, and domestic purposes in the United States.

This is a very strong statement, but is merely the *consensus* of

the reports from engineers and experts of repute, who have visited and thoroughly inspected the plant. At a most favorable natural location in Lake Gulch, near the head waters of Cherry Creek in Douglas County, Colorado, the Company has created Castlewood Lake, a most beautiful and imposing sheet of water, by the erection across the cañon of their Castlewood Dam. This substantial fabric has been designed and constructed in the most enduring manner of the most approved material, a non-porous sandstone laid in cement mortar.

Nature favored this enterprise by providing (1) a natural reservoir, "whose artificial duplication would cost a million of dollars," (2) quarries of finest building stone, situated on *each* side of the cañon, and (3) clean, fine-cut sand to mix with the cement. These advantages, especially the stone, contributed to make the cost of this structure *about one-half* the amount which it could be duplicated for under ordinary conditions.

Castlewood Dam is 625 feet long, 68 feet high, 85 feet wide at base, and 8 feet at top. The inner or receiving wall is built upon solid clay foundations of rock laid in cement mortar, and varies from five to twelve feet in thickness, having a batter of one foot in ten.

The outer or retaining wall is constructed in a similar manner to the inner wall, in a batter of "one in one," but laid in courses or steps suitable for bearing an additional height should it be found desirable by the Company in their future operations.

The interior "fill" is of hand-laid dry masonry, no earth being used.

Across the entire inner wall of this structure an earthen apron has been constructed having a slope of "three to one" to a height of forty-five feet, thus preventing the water from the lake (which it is designed never to keep above this level) from ever coming into actual contact with the masonry of the dam itself.

The "care of the water" is a point to which the Company's engineers have devoted much time and preparation. The water is conducted from the lake into the Company's Canal (through a mile or more of the bed of the natural stream) by a large cement conduit or pipe, three feet in the clear. This pipe is surrounded on all

sides with two feet of solid concrete and receives its supply from the main valve chamber in the inner or receiving wall of the dam. This valve chamber is built upon its own foundation and is perpendicular as against the inner wall's batter of "one in ten" so that it is clearly defined at the top of the dam, as shown in the plans thereof.

Eight iron pipes convey the water from the lake into this chamber thence through the conduit into the canal, thence over the Company's and other lands for distribution. Each of these pipes has its own separate valve, so that the supply can be nicely regulated by employing one, two, or more up to eight pipes for service, each one being worked independently.

The caring of surplus or "flood" waters beyond the capacity of these pipes is done by a paved "by-pass" to be cut into the cañon at the right end of the dam, to a depth of one foot below the line of the main waste-weir in the dam itself. This waste-weir is four feet deep and one hundred feet long and through these three avenues, the pipes, the by-pass, and the waste-weir, much more than ordinary precautions have been taken for the careful handling of no matter how large a volume of water.

**The Canal and Laterals.**—The Company have completed about forty-two miles of the main line alone, and eighty miles, altogether, of canal and laterals. This work is in keeping with the care and intelligence shown in the construction of the dam, and is remarkable above other canals (1) for the use of syphon pipe lines for the carriage of the canal across gullies or arroyas, (2) the heavy, substantial character of the (few) flumes employed, and (3) the fine character and finish of the earthwork. These same excavations of earth have been done on side hills (instead of the excavated earth being used for an outer bank) as on the level land, thus ensuring the canal against wash-outs, which frequently destroy constructions of the kind indicated in the above parenthesis.

The Company will ultimately have four or more lower reservoirs (one of which, the Clark Reservoir, is now in process of construction), as they design Castlewood Lake to be a great "catch basin," and the lower reservoirs, having the combined capacity of the lake, to act as storage and distributing centres and station.

The water rights of this Company are not surpassed in value by

those of any similar corporation, and the legal ownership is undisputed and fixed.

**Value of Property.**—Discounting the Company's own sales to date and the appraisals of informed and unprejudiced Eastern and other experts, it is perfectly conservative to estimate the Company's irrigated land at \$200 per acre; its water plant at cost, and its water rights at \$25 an acre. It will sell both land and water from the beginning at a high valuation. We then have this result:

14,000	<del>17,400</del>	acres irrigated land at \$200 per acre	·	\$2,800,000
		3,000 acres dry or pasture land at \$50 . . .		150,000
		Water plant, including land thereunder, <i>at cost</i> ,		425,000
		Water supply for 40,000 acres . . . . .		1,000,000
				<hr/>
				\$4,375,000

This does not take into any account

1. The possibility of furnishing more than 40,000 acres of water, while the present system is estimated by experienced engineers to have a capacity of from 43,000 to 60,000 acres;
2. The use of the lake for resort purposes;
3. The use of the water for motive power purposes;
4. The sale of building stone;
5. The sale of ice;
6. The sale of terra-cotta clay; or,
7. The Company's houses, live-stock, etc., all of which are present and developed values, with prospective and undeveloped incomes.

**Profits of Fruit Raising on Similar Land.**—The following shows results of Fruit Farming in Colorado upon land similar in location and character to the property of this Company. The Secretary of the Company addressed these landowners the following questions:

1. What kind of fruits are you raising?
2. What was your net profit last year?
3. What fruits do you consider best for the eastern slope?

1. C. K. Combs, P. O. address, Denver, Colo., has a five-year-old apple orchard, from which he raised last year seventy bushels

to the acre, worth \$3 a bushel in this market. He also has three acres of blackberries which yielded him \$2,500 one year. His usual average for blackberries, raspberries, and currants is \$500 an acre. His land is about six miles north of Denver.

2. W. A. Benedict, P. O. address, Denver, Colo., has a strawberry and blackberry tract, which averaged him \$500 an acre. His land lies about six miles north of Denver.

3. L. G. Morris and Frank Lawson (same P. O. address) report results equally as good as their neighbor, Mr. Benedict.

4. E. H. Sumner, P. O. address, Denver, Colo., has seven and one-half acres in small fruits. They yielded over 30,000 quarts last year, selling (in this market) for from twenty to twenty-five cents a quart. His apples averaged him \$420 an acre. Mr. Sumner's land lies about six miles north of Denver.

5. These five men are intelligent, thrifty, and know their business. Their land is held at \$1,000 to \$1,500 per acre, and is cheap at the price.

6. W. B. Felton, whose P. O. address is Cañon City, Colo., received for the product of his ten-acre fruit farm for 1889, \$6,023.89. The total expenses, counting labor, boxes, barrels, and everything, was \$2,406.78, leaving a clear profit of \$3,617.11, or over \$360 per acre.

7. Mr. J. J. Jones, whose P. O. address is Petersburg, Colo., six miles south of Denver, and three miles west of our land, realized \$6,000 for the apples raised on his twelve-acre tract last year, or \$676 per acre, gross.

8. Mr. B. F. Rockafellow, whose P. O. address is Cañon City, Colo., is the owner and manager of "Fruitmere," the most celebrated vineyard and orchard farm in Colorado. He has refused \$125,000 in cash for his place, and his results and profits only show what can be done with irrigated land under intelligent management.

9. Mr. Elwood Easley, Golden, Colo. (twelve miles from Denver), is a progressive fruit-grower and gardener, and says: "I have about forty acres in cultivation, about half in alfalfa hay, the balance in fruit and vegetables, and took \$4,500 net from it last year, one acre of cherries yielding \$550 on sixth year from setting out. Apples, pears, and plums are surely a success, and the hardy

varieties of grapes do well near the mountains, and so do all small fruits."

10. Mr. David Brothero, of Denver, who is a prominent fruit-grower and a pioneer, and came here in 1865, says: "A man can make money farming on irrigated land in Colorado if he can anywhere on earth. The resources of this State are wonderful enough when the truth is told. No need to exaggerate. I have a tract of about twenty-five acres of apples at my place, five miles west of Denver, from which I took about \$2,500 this year; but these are all young trees yet, and will increase, of course, as they grow older. Yes, I had rather raise fruit than farm. There will be more money in it."

11. James Ackerman, Esq., of Hygiene, Colo., who is a successful and prominent fruit-grower, was asked the usual questions by us, and his reply was:

"In answer to your first question would say, I raise all the tree fruits except the peach and apricot.

"To your second question, my net profits were about \$200 per acre.

"To your third question, the apple, pear, plum, cherry, raspberry, blackberry, strawberry, currant, gooseberry, and grape.

"I have derived the most profit from apples, pears, plums, raspberries, and currants."

Mr. C. F. Smith, whose P. O. address is Greeley, Colo., made affidavit that the yield for 1890 from his ten-acre tract under the Latham ditch was 1,750 bushels of potatoes.

Potatoes weigh about sixty-two pounds to the bushel, and sell in the Denver market at \$1.00 to \$1.65 per 100 pounds at wholesale.

Mr. H. M. Miller, whose P. O. address is Greeley, Colo., made affidavit that the yield from his twenty-five acres under No. 2 ditch, for 1890, was 5,000 bushels of potatoes.

J. C. Benton, also under the No. 2 ditch, made affidavit that he planted twenty-nine acres of potatoes, which returned to him 5,050 bushels, while he cut eighty tons of alfalfa hay from twelve acres.

These yields, as can be seen, are not from test acres, but are the results of the legitimate cultivation of a considerable number of acres; and we could quote more equally good showings were

further proof of the high value of our land, near so large a market, necessary.

### **The Company's Advantages:**

1. An unrivaled location (see accompanying map) adjoining the large, prosperous city of Denver.

2. The ownership of both the land *and* the water. Well-managed land companies owning no water have been uniformly successful. Irrigation securities and water company undertakings are universally "safe" and profitable, for water is an absolute necessity of life everywhere—in no country more so than Colorado, for farming is a failure without it. This Company owns both land and water: land, the basis of value, and the water, which enhances the value.

3. A practical control of the water supply. We create our own water supply by storage, and are not dependent upon any uncertain stream.

4. The ownership of a large, beautiful lake, whose value is very great, situated, as it is, in an otherwise "arid" region, and near enough to Denver to be utilized for fishing, shooting, boating, resort, and ice privileges.

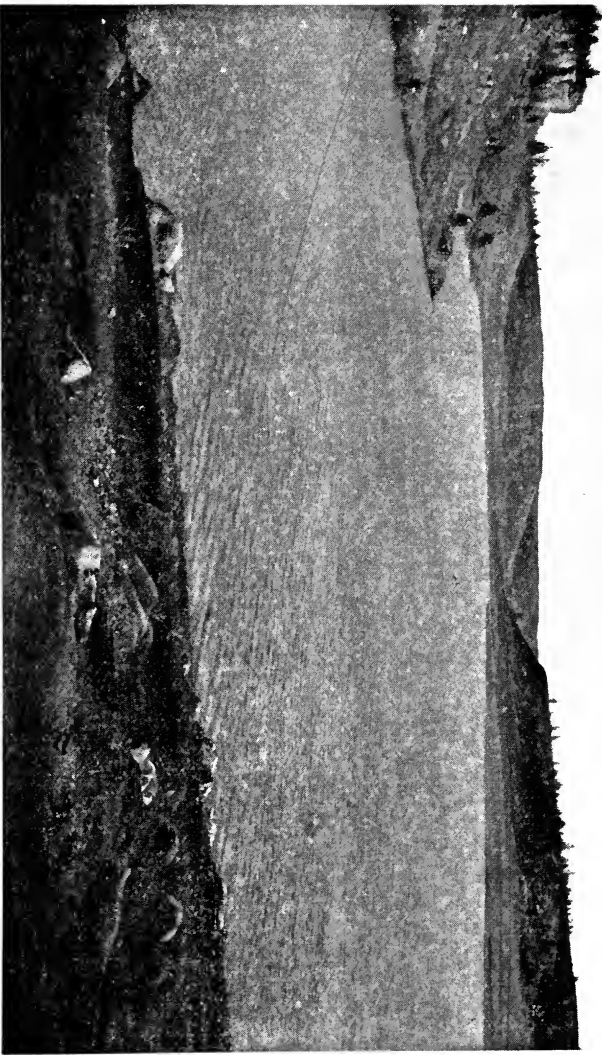
5. A variety of sources of income, such as sales of land, sales of water, rental of land, sales of building stone, clay, ice, and water-power for manufacturing purposes, besides the profits of the resort and sporting privileges of Castlewood Lake.

**Income.**—The Company's operations to date have been limited to the sale of land. They have sold seventy-three ten-acre tracts from June 1, 1891, to date, at prices which will net them \$250 an acre, and their plan for selling small tracts is meeting with much favor.

It is not too much to say, with perfect safety, that their operations from the sale or leasing of the diverse kinds of property owned by them, land, water for irrigation, domestic, and motive-power purposes, building stone, clay, etc., will pay their fixed charges, operating expenses, and a handsome dividend on their stock; as soon as their very extensive plant is in thorough working order.

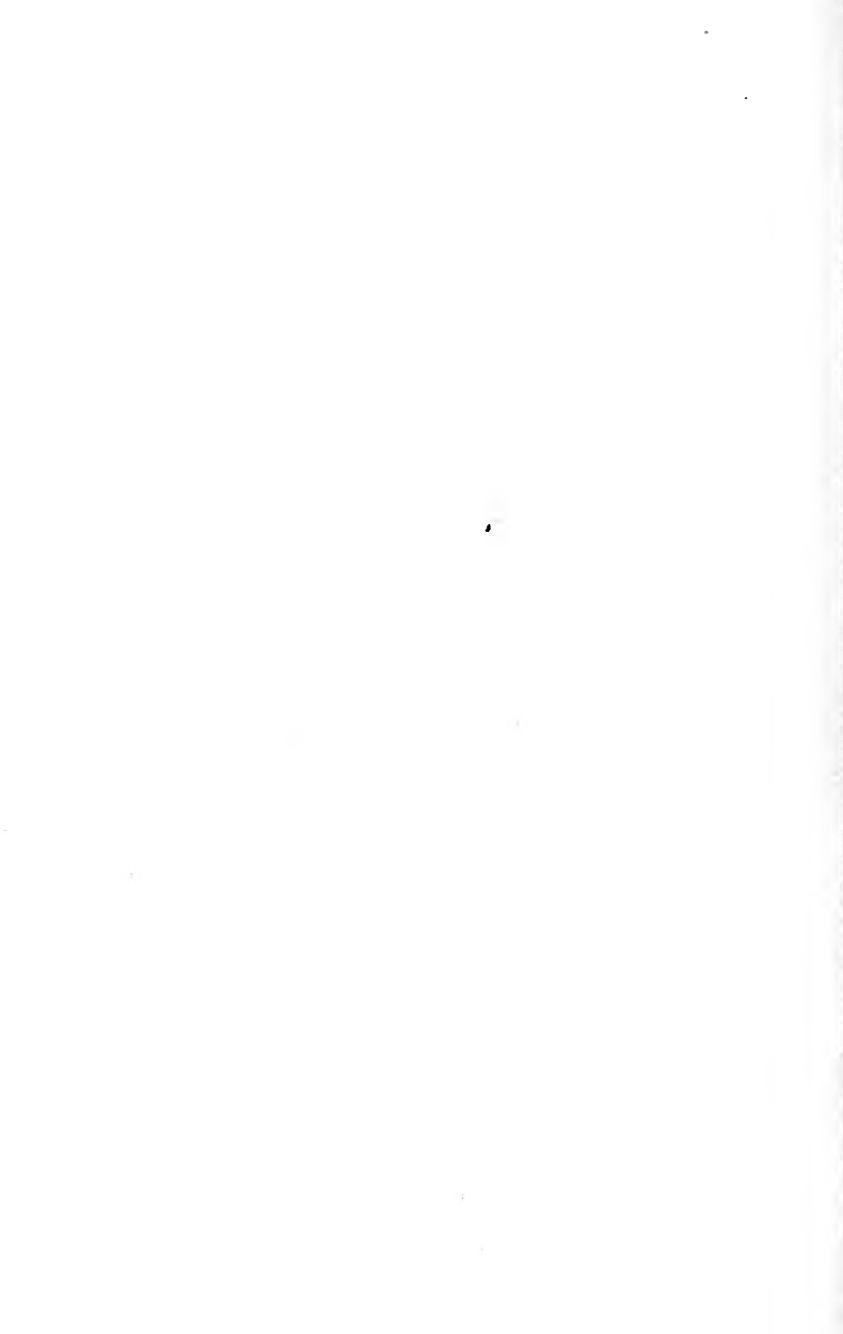
**Bonds.**—The General Mortgage Thirty Year 6 per cent. Gold Sinking Fund Bonds (through the operations of existing agreements between the Company and holders of the bonds of its predecessor





CASTLEWOOD LAKE, FROM TOP OF DAM.

MAIN RESERVOIR OF THE DENVER LAND AND WATER STORAGE CO.



companies), will become a first and only mortgage upon all of the property described in the beginning of this prospectus, and all property hereafter to be acquired. As the land alone (appraised at prices lower than those now being realized) is worth considerable over two millions of dollars, leaving the water plant and rights entirely out of consideration, the security to bondholders is evident and large.

These bonds may be redeemed by the Company at a not greater price than 110, through the operations of a Sinking Fund which receives 60 per cent. of a schedule selling price of each sale made.

The legal affairs of the Company have been from its incorporation, and are now under the charge of Hon. Charles H. Toll and Wm. R. Barbour, Esq., Denver, and Messrs. Bangs, Stetson, Tracy and MacVeagh, New York, to whom references regarding such matters may be made.

In this connection we append

## COUNSEL'S OPINION.

DENVER, June 5, 1891.

We are asked our opinion upon the regularity of the consolidation proceedings of The Denver Water Storage Company and The Denver-Arapahoe Land Company, resulting in the formation of The Denver Land and Water Storage Company, and upon the regularity of the \$800,000 mortgage of the latter Company to the State Trust Company as trustees, dated May 1, 1891, known as the General Mortgage of said Company.

With reference to these matters we have to advise that we attended the meetings of the stockholders of the constituent companies, and are of the opinion that their proceedings were regularly conducted and that the consolidation of these companies was duly and properly effected.

The certificate of incorporation of the consolidated Company, The Denver Land and Water Storage Company, was drawn in conformity with the statute and executed by the proper persons and in accordance with the requirements of the law.

We have examined the record of the proceedings of the Board of Directors of The Denver Land and Water Storage Company, and are of the opinion that the General Mortgage of that Company was duly and regularly authorized and executed.

The mortgage was prepared in New York. We have examined

it carefully, and consider it an especially well drawn instrument, and are of the opinion that it provides proper and sufficient remedies for the bondholders and that its terms are in conformity with law.

CHARLES H. TOLL.  
WILLIAM R. BARBOUR.

**Fruit Tracts For Sale.**—This Company is endeavoring to prove that “ten acres enough” is a fact as well as a theory. Reference to page 8 will convince the careful reader of the great profit of fruit raising near so large a market as Denver.

**We Have a Plan,** *whereby we plow the land, plant the trees, set out the small fruits, fence and thoroughly cultivate the land. You pay us in easy installments for the mere cost of doing this, and when it is finished and the tract is in a profitable condition YOU GET THE LAND without any further payment than the taxes and a small annual maintenance tax for the water-right.*

Send for our pamphlet, “The Golden Opportunity,” fully describing the Clark Colony plan.

**We also sell land outright** at prices that are attractive to any investor who believes in the safety of irrigated land as a permanent form of investment. We will quote prices, terms, and give full information to anyone writing to either our Denver or New York office. Land in and about Denver has made the fortune of many a non-resident, and we have the only land near Denver irrigated by the scientific reservoir system. *Write for terms.*

## Extracts from Reports.

HENRY R. WOLCOTT, Esq., Denver : “I have the greatest confidence in the future value of the property owned by your consolidated Company. I have visited the reservoirs and driven across the land from one end to the other. I know of no better land than that owned by the Company and the adjacent territory which it is proposed to irrigate with the water from your reservoirs and canals. . . . We have greater and more varied resources than any State in this Union and must grow rapidly, and with this growth must come an increased value to all of your lands, and there cer-

tainly can be no safer investment here than in well secured water-rights.

“I believe fully in the merit of your scheme. . . . It is of the greatest importance to the State that such enterprises should be built up, and I feel confident that your Company will have a prosperous future.”

H. A. WOODS, Esq., C.E., formerly Chief Engineer and General Superintendent of the Panama Railroad Company: “The general character of the work shows of itself that great care was taken in constructing both front and back walls above foundations, and equal care was taken in placing the interior mass of loose rock. I believe the foundations of the dam secure, and in proof of this would say that the back wall, which is 70 feet above the natural surface of the creek bed, shows neither settlement, crushing, change of alignment, nor crack, in its extreme length, and that the front wall is in equally good condition.”

R. D. HOBART, Esq., C.E., formerly Engineer-in-Charge, Sewer Department, City of Boston, and Engineer Fitchburg R.R.: “I will say that from the observations made, together with the reports of your engineers, I do not hesitate to say that if the statements of your engineers and gentlemen connected with the work were correct, that the structure now built is a good and substantial piece of work, and in my opinion perfectly safe to hold the amount of water which it was intended for. . . . One very satisfactory evidence of the stability of said dam is that no settlement has taken place since its construction.”

WALTER H. GRAVES, Esq., Superintendent of Irrigation, Indian Department: “The dam as constructed is an unusually substantial structure, and so constructed as to be fully able to meet all demands which could be made upon it.”

CHARLES W. GREENE, Esq., New York City, Irrigation Expert: “I personally rode over, or in plain view of all their lands; about 14,000 acres of them can be irrigated, and the balance is fine pasturage, and capable of producing same crops without irrigation. They are of high quality; the soil is a deep chocolate loam, with a very small percentage of clay, which prevents washing, resting upon a clay subsoil.

“The surface requires no leveling, and there is absolutely no waste land in the entire tract. . . . It can be made to realize \$300 an acre average.”

WALTER C. FROST, Esq., to the Globe Investment Co., Boston : “The enterprise seems, after due and deliberate consideration, well conceived, and we believe it will succeed. . . . The great piece of engineering at the head of this cañon seems well calculated to do its part. It consists of eighty thousand tons of rock, scientifically set in one-and-a-half million pounds of cement. . . . The land, if measured by the market price of land of the same kind, with a water-right on the high line ditch, at the same distance from Denver, is worth, with a water-right, from \$150 to \$300 an acre.”

THEO. ROSENBERG, Esq., Civil and Hydraulic Engineer : “According to your instructions I have made examination of dam at Castlewood, in Douglas County, and herewith hand you report on same, prepared from notes taken on the spot.

“I find that the site of the structure is all that can be desired for such purpose; the abutments of the dam resting against and being bonded into very hard rock, which extend on both sides of the dam, faces for a considerable distance, and also above the top of the dam, thus affording a configuration of the ground eminently adapted for a waterlock of the strongest kind.

“The artificial structure consists of quarry-faced rock of great density and structural hardness, laid up toward the reservoir side in courses with battering face (1 : 3); and on the discharged side in regular coursed steps, attaining a height of sixty-eight feet by a thickness of over eighty feet on line, respectively, above line of natural ground. The faces of the stonework are quarried and the work is done with considerable care and neatness; the joints are filled with cement mortar, which, from tests since made, is of a superior quality and well suited to the character and purpose of the work. The stone courses are laid with a sufficient number of headers and double-headers stoutly bonded and of large size. The joints show evidence of careful work, and are, in beds and on sides, full of mortar.

“The core of the dam consists of a filling with large size broken stone, grouted in layers, and its top is about eleven feet wide.

Four sets of tile pipe, two pipes in each set, form the discharge of the reservoir. These pipes are closed by valves, which are reached by a circular shaft of solid masonry extending vertically almost the full height of the dam above the natural ground line, and the valves allow the operator to gauge the quantity of discharge water to a nicety. On the discharge side the pipes enter a three-foot tile drain, which in turn empties into a paved ditch, from where the water takes its course into the natural bed of Cherry Creek. A by-pass of some forty-five feet in width at the maximum height of the water in the reservoir, resting on one side against the transversed end of the dam superstructure, and against the natural rock ledge on the other side, with a sufficient grade augmented by a somewhat narrower but similar water way on the opposite end of the dam, form the overflow discharge of the reservoir and allow spilling. The dam is further strengthened by an apron of earth on the side of the reservoir, and extends some three hundred feet horizontally on a line of the level of bottom of superstructure, and vertically to within about twelve feet of the top of the dam. The formation of the rock ledge on the side of the dam nearest to the bed of Cherry Creek, facing the reservoir, is of such a nature as to prevent any great or direct pressure resulting from spring floods or other sudden rise of the creek against the back of the dam, inasmuch as the creek has to turn around the ledge and pass the foot of the ledge on a curve of large radius, and for a considerable distance before it comes in contact with the dam. Before it can do that it has, furthermore, to overcome the rise of the earth apron, so that a direct impingement is conditioned by several stages of obstructions which the creek, even at its greatest velocity and discharge, would have to overcome.

“From what I could observe, as a result of my observation, covered by the within report, I conclude that the dam in its construction and location presents remarkable features of safety and strength, and that it is abundantly, even excessively, heavy, and therefore amply able to resist any hydrostatic and hydraulic pressure, either singly or combined, which, by the nature of its purpose, or by contemplation of any condition, with its location, can possibly ever be applied to it, considering such press-

ure on a line from the top of the natural ground to the top of the dam."

HERBERT I. REID, Esq., City Engineer, and G. P. D. TOWNSEND, Esq., C.E., Colorado Springs: "Generally speaking the dam is of enormous strength. The factor of safety is much larger than is usually employed in structures of this type. The plans show evidence of ability and labor; the work of construction is seemingly carried out in the most thorough manner that means, expense, and engineering skill can command. So far as we are able to judge, money and skilled labor are not spared in making the structure the best possible. . . . Near Denver there is a great demand for small tracts of land covered by irrigation ditches for market gardening, etc."

DONALD FLETCHER, Esq., Denver: "Relative to stocks and bonds in irrigating canals in this State, I know of several which pay promptly, and do not know of any that default. I know the Denver Water Storage Company only in a general way and that entirely favorable. There is no reason why it should fail to be a very excellent concern, and, if properly managed, as the character of its promoters warrants us in expecting, it should prove a profitable investment."

THE NEW YORK "SUN" of April 5, 1891, in an article on benefits of irrigation in California and Colorado, makes the following allusion to the property of this Company: "In 1880 there were 600 miles of irrigating ditches in Colorado. In 1889 there were 34,000 miles in operation, constructed at an expense of \$10,000,000. It may be safely stated that there are not more than 25,000,000 acres of irrigable land in Colorado, thoroughly to utilize which will require every drop of water which falls inside the State. The limited area of the irrigable arable land in Colorado in proportion to the total acreage of the State, and the demands of the cities, towns, and mines for its products, have given such land an excellent market value which is rapidly enhancing, especially near Denver, Pueblo, and Colorado Springs. Colorado farmers and nurserymen are fortunate in this respect. The State is largely mountainous and the products of the land find a ready sale in the large cities and mining camps, which consume but don't produce, and have hitherto depended for their support on far-away



Iowa and Illinois. Land with a water-right attached to it is worth from \$25 to \$250 an acre near Pueblo ; from \$25 to \$500 an acre near Colorado Springs, and from \$50 to \$1,500 an acre near Denver, and is cheap at those prices, considering the income-paying quality it has developed.

#### GREAT WORKS AROUND DENVER.

The Platte River runs through the city of Denver, and as a consequence intersects the most valuable land in the State ; but it doesn't water it, by any means. Its normal flow has been over-appropriated notoriously. The canals, especially the larger ones, taking water from this stream, will be obliged to supplement their present methods of delivery by the storage-reservoir system to furnish all the water they have contracted to deliver.

The storage-reservoir system, as adopted in California, is an absolute necessity. The land was there—the enormous water drainage was clearly and accurately indicated in Hayden's official surveys—the profits were sure to be large. This necessary and tempting combination induced the formation of the Denver Water Storage Company by a party of Denver, New England, and New York capitalists. This Company will have in operation this summer the first large irrigation system in the State depending upon the storage reservoir for their base of supply. The experience of California long ago proved that while it was true that by irrigation was the scientific way to farm, the reservoir system was equally the scientific way to irrigate. The relations of the seller and buyer of water under this plan have been harmonious and satisfactory, and the supply sure and accurately determined. The Company executed the plans of A. M. Welles, which included a large masonry dam, creating the main catchment basin, and a complete distributing system of canals, laterals, and reservoirs.

About one mile and a half down a picturesque cañon the diverting dam of stone, earth, and piling throws the water from the creek bed into the head gate of the Company's Arapahoe canal. Flumes have been practically dispensed with, and are used only in crossing short and deep gulches, where a wasteway is desired in the canal. In their place sunken or syphon pipe lines are employed as a form

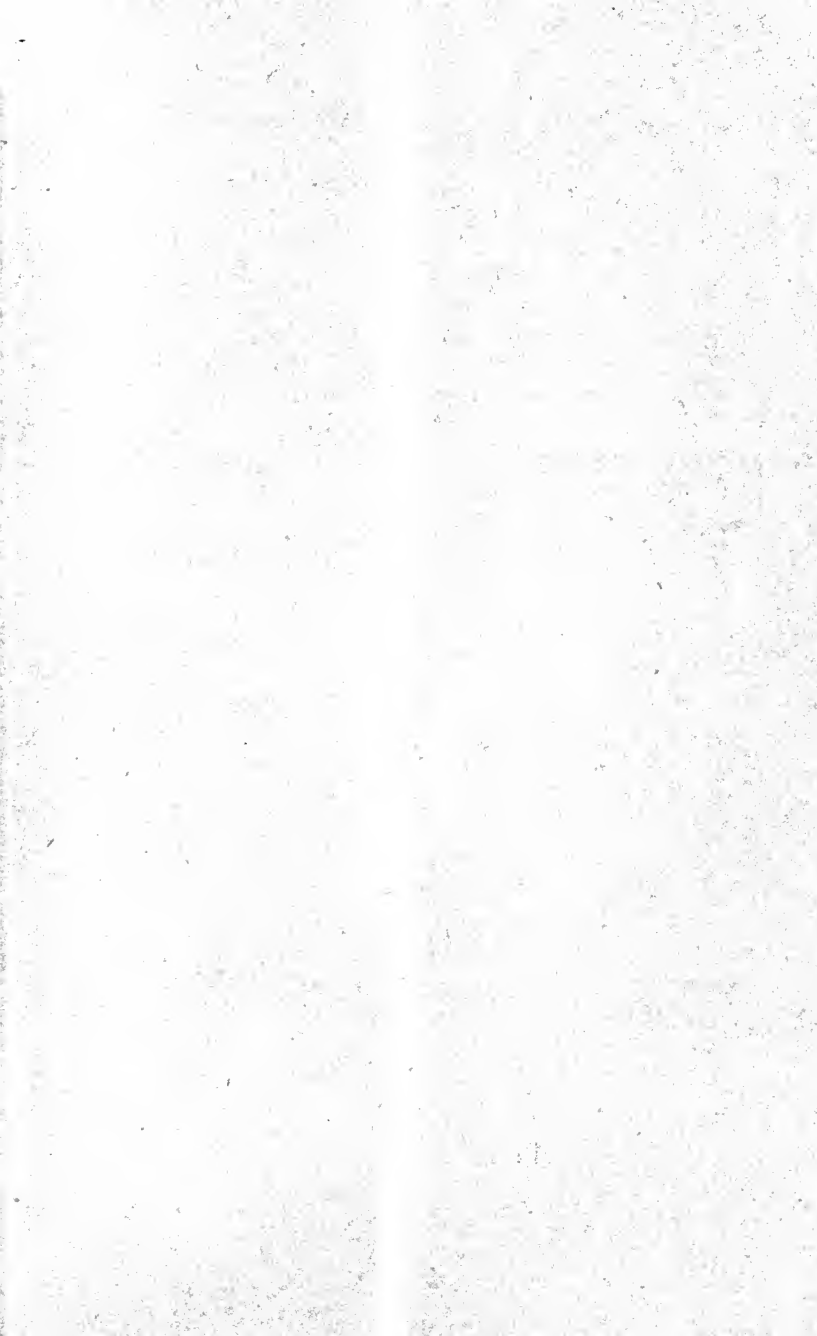
of construction, less expensive to maintain and much more permanent. This Company owns about 17,000 acres of land in Douglas and Arapahoe counties — some of it adjoining the platted additions to the city of Denver. Their enterprise and courage has converted the most valuable tract of “dry unproductive land in Colorado into a source of profit to themselves, and the cultivation of this land will prove to be of great aid to the additional development of Denver.” This idea was conceived by W. E. Alexander, and was carried through under the financial management of Carlisle N. Greig, with the aid of a number of Eastern capitalists.

The cut, “Castlewood Lake,” here shown, is a reproduction of a Kodak view taken from the top of the dam. The Denver company which will manage this property will cultivate about 3,000 acres, in fruit, berries, vegetables, and alfalfa, this year, build roads, and develop their holdings.”

## Denver.

POPULATION . . . 150,000

Building operations for 1890 . . . . .	\$16,541,625.00
Realty sales for 1890 . . . . .	65,500,000.00
Wholesale jobbers' sales for 1890 . . . . .	38,370,456.00
Value of manufacturers' output for 1890 . . . . .	44,075,802.00
Bank clearings for 1890 . . . . .	255,599,001.38
Product of the farm for 1890 in Colorado . . . . .	45,000,000.00
Mineral output for 1890 “ “ . . . . .	29,880,734.00
Coal output for 1890 “ “ . . . . .	5,751,710.47
Stone output for 1890 “ “ . . . . .	3,000,000.00



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