

DEPARTMENT OF THE INTERIOR

GENERAL LAND OFFICE

WASHINGTON, July 20, 1910.

Annual Instructions

U. S. Surveyor General,

Phoenix, Arizona.

Sir:

By the Act of Congress approved June 25, 1910, (Public-No. 266), making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1911, and for other purposes, there was appropriated:

"For surveys and resurveys of public lands, under the supervision of the Commissioner of the General Land Office and direction of the Secretary of the Interior, four hundred and fifty thousand dollars: Provided, That in expending this appropriation preference shall be given first, in favor of surveying townships occupied, in whole or in part, by actual settlers and of lands granted to the States by the Act approved February 22, 1889, and the Acts approved July 3 and July 10, 1890; and, second, to surveying under such other Acts as provide for land grants to the several States and Territories, except railroad land grants and such indemnity lands as the several States and Territories may be entitled to in lieu of lands granted them for educational and other purposes which may have been sold or included in some reservation or otherwise disposed of, and other surveys shall include lands adapted to agriculture and lands deemed advisable to survey on account of availability for irrigation or dry farming, lines of reservations, and lands within boundaries of forest reservations. The surveys and resurveys to be made by such competent surveyors as the Secretary of the Interior may select, at such compensation not exceeding two hundred dollars per month as he may prescribe, except in the District of Alaska, where a compensation not exceeding ten dollars per day may be allowed such surveyors and such per diem allowance, in lieu of subsistence, not exceeding three dollars, as he may prescribe, said per diem allowance to be also made to such clerks who are competent surveyors who may be detailed to make surveys, resurveys, or examinations of surveys heretofore made and reported to be defective or fraudulent, and inspecting mineral deposits, coal fields, and timber districts, and for making,

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by such competent surveyors, fragmentary surveys and such other surveys or examinations as may be required for identification of lands for purposes of evidence in any suit or proceeding in behalf of the United States, the sum hereby appropriated to be immediately available: Provided further, That the sum of not exceeding ten per centum of the amount hereby appropriated may be expended by the Commissioner of the General Land Office with the approval of the Secretary of the Interior, for the purchase of metal or other equally durable monuments, to be used for public land survey corners wherever practicable".

Deducting from the regular appropriation of \$450,000 the sums of \$85,000 for the examination of contract surveys, \$45,000 for the general purchase of iron posts, \$35,000 for the inspection of coal fields, and \$10,000 for the purchase of instruments, there remains available for apportionment among the several surveying districts the sum of \$275,000.

From the total of \$275,000 there is hereby apportioned to the district of Arizona the sum of \$20,000.

Selection and grouping of townships  
to be surveyed.

The law requires that in expending this appropriation preference shall be given in favor of surveying townships occupied in whole or in part by actual settlers and of lands granted to the States by the act approved February 22, 1889, and the acts approved July 3 and July 10, 1890; hence in taking measures for the assignment of surveyors, it will be your first duty to attend to the surveys applied for by bona fide settlers and the funds should be so applied as to benefit the greatest possible number of settlers.

Applications by settlers for the survey of lands including their claims will be required to be submitted to you upon the regular blanks

supplied for that purpose and upon receipt of such applications, you will transmit the same to the Chief of the Field Division covering the lands so applied for, after making proper notation thereof upon your records and you will advise this office of such disposal of the applications. The bona fides of all applicants for survey will be examined under the direction of the Chief of Field Division and a report thereon will be submitted to this office for consideration and action. In cases where the evidences of survey are satisfactory and the authorization of a survey is deemed proper the necessary instructions will be promptly issued to you in order that proper provision for the survey may be made.

The applications or petitions for survey must be signed by actual settlers on the lands together with the affidavits of the settlers setting forth the length of residence on their claims and the nature, extent and value of improvements made thereon; also a description of the character of the lands. You will advise applicants that bona fide settlement is a prerequisite for a survey and that settlers must be known to be actual residents upon the land they wish to enter. The erection of a log cabin and the clearing of a portion of the land, even the cultivation of a small tract of land around the cabin, will not entitle an applicant to a survey if it should be found that the region is heavily timbered and the applicant living elsewhere, with no apparent intention of residing upon the land and maintaining himself there.

When not less than three settlers in a township make application for survey and submit individual affidavits as to settlement and cultivation of the lands, the same will be forwarded to the Chief of Field Division for investigation, and if the settlement and cultivation are found to be satis-

factory and the lands adapted to agriculture, the survey of a full township will be authorized; should there be but two settlers in a township, the survey of two-thirds of the same or twenty-four sections will be allowed; and if but one settler in a township the survey of one-third or twelve sections will be allowed if the settlers prove upon examination to be bona fide.

The Act further provides for other surveys to include lands adapted to agriculture and lands deemed advisable to survey on account of availability for irrigation or dry farming, lines of reservations, and lands within boundaries of forest reservations.

You are to be governed by the above provisions in the selection of townships to be surveyed, such selections to be made in groups of suitable size when practicable to be completed by double parties operating from a joint camp during the surveying months of the season of 1910, and other groups as far as possible to be completed during the remaining surveying months of the fiscal year. The arrangement of the groups must be logical and consistent in such a manner that the survey of the necessary standard lines and township boundaries may be executed in advance in ample time to avoid interference and delay to parties engaged in subdivisional surveys. The interpretation of the provision for other surveys to "include lands adapted to agriculture and lands deemed advisable to survey on account of availability for irrigation or dry farming, lines of reservations, and lands within boundaries of forest reservations" must be made broadly in the interest of the public good, in such manner as to avoid needless fragmentary surveys in the immediate vicinity of lands promising early settlement, in order to complete the public surveys over such areas.

Such selections or grouping of surveys will be subject to the approval of this office, or when expedient, subject to the approval of a designated supervising surveyor, the assignment of surveys to be known by group numbers.

By the terms of the appropriation act other surveys are required to be confined to lands adapted to agriculture and lines of reservations and lands within boundaries of forest reservations. With regard to the survey of public lands this restriction is construed as pertaining to the extension of township lines and subdivisional surveys. It will, in some instances, be desirable and necessary to extend the standard lines over mountainous or inarable regions, in order to insure correct connections and form bases for succeeding lines, but it is not deemed necessary to extend township exterior lines over lands that are clearly non-agricultural in character and unsurveyable under existing law and instructions, for the sole purpose of making proper closures.

It is the present policy of this office to carry forward the exterior lines at the same time as the subdivisional lines, as the same shall be called for by actual or prospective occupation of the land by settlers.

In order to reach agricultural land it is not imperative that the survey of exterior lines be completed, and occasions may arise where it will be found necessary to run section lines as offsets to township exteriors in order to avoid non-agricultural and unsurveyable land and insurmountable objects, and, so far as the closing of surveys is concerned, section lines may be considered as important as exterior lines. Cases will arise especially in mountainous regions where a considerable area within a given township

is not adapted to agriculture, while the arable portion of the township is occupied by settlers, and as preference is to be given, under the law to occupied lands, you will, in arranging for surveys in mountainous regions, or in a tract of country where you know, or have reason to believe, that a portion of the lands is unfit for agricultural purposes, especially instruct your surveyors as to the legal requirement to confine the surveys to lands adapted to agriculture, and direct them in surveying townships containing both classes of lands, to extend the subdivisional lines over all the lands in the township that can be properly classed as agricultural.

The appropriation act of June 25, 1910, besides providing that in expending the appropriations for surveys and resurveys of public lands preference shall be given first in favor of surveying townships occupied in whole or in part by actual settlers and of lands granted to the States by the several acts, also provides that preference shall be given in the second place

"to surveying under such other acts as provide for land grants to the several States and Territories, except railroad land grants and such indemnity lands as the several States and Territories may be entitled to in lieu of lands granted them for educational and other purposes which may have been sold or included in some reservation or otherwise disposed of . . . "

When an application shall be made by the State for surveys under any act providing for a land grant thereto, not covered by the exceptions made by the appropriation act, such application will be forwarded for the consideration of this office, whereupon the question of authorizing the survey will be determined.

Surveys within the limits of R. R. land grants, surveys within Indian Reservation, and surveys payable from special deposits by individuals.

The survey of lands within the limits of railroad grants will be executed in accordance with the principles heretofore obtaining, viz: the company will be required to deposit the funds necessary for the survey of township exteriors and subdivisional work, and the office work and regular appropriation will be available for the survey of standard lines, retracements and resurveys in connection therewith. In order that a proper accounting may be made, such division of these two funds will be administrative work, and perhaps one party may be assigned to each class of work. The funds will be available as soon as deposits are made by the company and can be drawn against by the disbursing officer in charge of the expenditures of funds in your district.

Precisely similar to this will be the work where special deposits are made by individuals or others coming within the provisions of Sec. 2401, as amended by the act of August 20, 1894.

For the survey of Indian Reservations under special acts, special provisions will be made in each case, depending upon the availability of parties to be assigned and can be worked along precisely similar lines, except that all the work will be paid for out of the special funds applicable thereto.

#### Examination of contract surveys.

All contracts entered into under the appropriation for the fiscal year ended June 30, 1910, should be executed in the field and the returns forwarded to this office at the earliest practicable date. When returns of surveys, under any given contract or contracts, shall have been filed in your office, it will be your duty to cause an examination of such returns

at the earliest possible time with a view to determining, as far as practicable, from the face of the returns, whether the surveys are in proper condition for inspection in the field and if, from such office examination of the returns, the surveys appear to have been correctly executed you will promptly advise this office that the surveys are ready for examination in the field. If such office examination shall develop errors which necessitate the return of the deputy to the field for the purpose of correcting his work you will issue the necessary instructions therefor, and upon/filing of the field notes of the corrective survey, if the same be found satisfactory to your office, the same may be reported as ready for examination in the field. It is the intention of this office to have the examiners extend their examination<sup>s</sup> into each and every township surveyed under any given contract, as usual, but to complete the examination of contract surveys at the earliest practicable date.

The sum set aside for examinations will be retained under the control of this office and expended for the maintenance of a corps of competent U. S. surveyors who will be detailed according to the exigencies of the service in the several surveying districts. Employees of this office who are competent and experienced public land surveyors will also be detailed to make examinations in the several surveying districts whenever such a course is necessary in order to expedite and complete the work in this branch of the service. It is the intention of this office to have all examinations in the field made by regular U. S. surveyors or office employees detailed for the purpose, except where exigencies arise making this course impracticable.



### Special Instructions.

The provision of the Manual of 1902 in regard to the preparation of special instructions to accompany every assignment of surveys under group numbers will continue in full force and effect as heretofore provided for the assignment of surveys under contract. The special instructions are required to be complete in setting forth the survey to be executed under any assignment, the initial and closing lines, the nature of the survey, method and order of procedure, the reports required, the preparation of the returns, and the accounting system.

The special instructions will be prepared as usual subject to the approval of this office, or when expedient, subject to the approval of a designated supervising surveyor. The special instructions to accompany surveys may be prepared simultaneously with your selections of the surveys to be made under a given group, in order that both may be advantageously forwarded together to this office for consideration and suitable action at one review. This may be done in advance of the designation of the surveyors who will execute the survey.

### Supervision.

Two Supervising Surveyors have been designated from the roll of U. S. surveyors to act in the capacity of technical administrative field assistants to this office. Their duties will be to supervise the proper organization of parties, their equipment, instruments, camping outfit, and subsistence, and in general exercising their judgment and experience to promote efficiency in the field work, economy in expenses, and as far as possible uniformity in proper field methods in the execution of surveys and in

the preparation of the returns thereof. Not a small part of their duties will be to secure uniformity and correctness in the preparation of the accounts of the surveys to conform with the requirements of this office and the views of the Auditor.

A number of Assistant Supervising Surveyors have been designated from the roll of U. S. surveyors who will assist in the proper organization of the necessary surveying parties under the new plan, acting as supervisors in the absence of the principal, as well as engaging in contract examination work or employed in original surveys after the completion of the examinations of the present outstanding contracts.

#### U. S. Surveyors.

The appropriation act provides for "The surveys and resurveys to be made by such competent surveyors as the Secretary of the Interior may select"; the selection of U. S. surveyors will be made guardedly, and the appointees will be required to qualify under the Civil Service regulations as to eligibility. The nucleus of the roll of U. S. surveyors has been organized from the former roll of Examiners of Surveys.

#### Transitmen.

Bearing in mind that the new system cannot reach its full organization until all outstanding contracts are completed and examined, owing to the fact that most of the former Examiners of Surveys and many of the practicing Deputy Surveyors are now busily engaged with contract surveys, also bearing in mind the advisability of utilizing under the new plan the valuable services of the qualified practicing Deputy Surveyors many of whom will doubtless be available as transitmen in each district, but who for business and other personal reasons may be unwilling to engage in the regular duties

of U. S. surveyors, provision is made for the employment under salary, under the limitations of the appropriation, of qualified transitmen, who will be recommended by you from your list of eligible surveyors. The salaries of transitmen are limited to a range of from \$100 to \$150 per month dependent upon the responsibilities under an assignment as well as upon the qualifications and experience of the men employed.

#### Surveying Instruments.

Provision is made to continue the practice of purchasing surveying instruments and the smaller sundry tools including tapes, clinometers, rods, steel punches, etc., at this office for distribution to the surveyors. However, during the period of organization it will be expedient in many instances to engage the use of surveying instruments and smaller tools from the personal outfit of transitmen engaged to execute surveys, discretion in this particular and rates of compensation resting with the Supervising Surveyors subject to the approval of this office.

#### Camp Outfit.

The Supervising Surveyors and their assistants will be charged with the responsibility of the purchase of all of the heavier and more expensive of the camp equipment, principally tents and cooking outfits necessary to be provided for the field work in the several districts. Provision for engaging camp outfit from the personal outfit of transitmen engaged to execute surveys is made corresponding to the provision for the hire of instruments by Supervising Surveyors, also subject to the approval of this office.

#### Horses and Wagons.

In instances where especial economy will result from the purchase

rather than the hire of horses, mules, or wagons, the Supervising Surveyor is charged with the responsibility of recommendation as to purchase, contingent upon the approval of this office.

Iron Posts.

The purchase of iron posts for use in monumenting all surveys wherever practicable is arranged for by this office, and you will be required to make requisition to this office for shipment of the estimated number of iron posts necessary for any assignment. The 3-inch iron posts weigh 30 lbs. each and are to be used for all standard section and township corners, closing township corners, corners common to one, two or four townships, all section corners on township boundaries, and mile corners on boundary surveys. The 2-inch iron posts weigh 13 lbs. each and are to be used for all section corners in subdivisional surveys including closing section corners on standard lines or township boundaries. The 1-inch iron posts weigh 5 lbs. each and are to be used for all  $\frac{1}{4}$  section corners, meander corners, and corners of private claims surveyed under any assignment. All witness corners are required to be of the same size as would be used for the true corner.

Requisitions must be explicit as to the number of each size of the iron posts required, the railroad destination of the shipment, the consignee, and for the purpose of record the designated survey by group number.

Requisitions should be ample to cover possible inaccuracies in estimates and unavoidable loss by occasional damage. Requisitions may be made for assorted sizes in carload lots to be shipped to a central point convenient to extensive surveys, and surplus iron posts left over from completed surveys should be received and stored by the designated supervising

surveyor subject to future disposal, and in all cases the facts should be reported to this office to complete the open account of all iron posts.

Accounts.

In order to afford a check upon expenditures and expedite the payment of accounts for salaries, subsistence, and other miscellaneous expenses of or connected with the inauguration and execution of surveys, you will be charged with the duty of a preliminary auditing of the accounts of the surveyor in charge of each camp who will be required to render monthly accounts to you of all expenses, duly certified by the surveyor in charge and submitted to you for review and payment or other suitable action. In case of doubt as to the propriety of payment you will submit the questionable account to the designated Supervisor for consideration and report. You will be required to make requisition to this office for all regular blanks necessary in the return of accounts.

U. S. Surveyors engaged in original surveys acting as Special Disbursing Agents and rendering accounts direct to this office will be required to transmit a monthly abstract of expenditures to you to complete the account you will be required to keep of all funds disbursed in your district payable from your apportionment under the appropriation act.

An abstract of total disbursements under any assignment will be rendered monthly by you in connection with your monthly progress report as hereinafter provided, in the letter of transmittal of which reports you are directed to show an abstract of the month's expenditures under each group as well as the total expenditures to date in your district for the fiscal year payable from the appropriation for the survey of the public lands.

Your accounts as Disbursing Officer will be rendered quarterly to this office, as required in the accounting system. Requisitions for the advance of funds under your bond to meet the quarterly expenses of your district in the disbursements of funds payable from the appropriation for the survey of the public lands are required to be made in the usual manner.

Progress reports by all surveyors.

All U. S. surveyors and transitmen rendering accounts to you and engaged in the execution of surveys or in the preparation of the returns thereof, will be required to report weekly to you their daily progress or nature of employment, such reports constituting a basis of settlement for time employed.

U. S. Surveyors acting as Special Disbursing Agents will be required to transmit weekly reports to this office, as heretofore required of Examiners of Surveys, by reason of their accounts being rendered directly to this office for settlement, but coincident with the assignment of original survey work to such U. S. Surveyors who are now engaged in examination work, these surveyors also will be required to file with you a modified weekly diagram report showing the miles of survey executed each day.

For the present at least all weekly reports by U. S. Surveyors or transitmen will be made on regular blanks furnished upon requisition made to this office. But it is desired to devise at the earliest practicable date a suitable system of diagram report by surveyors in the field to the surveyor general's offices, and your own method in this regard may well be exercised in your district until a uniform system may be decided upon.

A general classification report is required of every surveyor to be rendered weekly to the Surveyors General to cover the survey of the subdivisional and other lines within each township as completed, the scope and nature of classification to include the following items in reference to the difficulty and cost of survey:

- A. Minimum.
  - B. Intermediate.
  - C. Maximum.
1. Surface.
    - A. Level or rolling land.
    - B. Rolling mountainous land.
    - C. Rough mountainous land.
  2. Timber.
    - A. No timber.
    - B. Scattering timber.
    - C. Heavy timber.
  3. Undergrowth.
    - A. Little or no undergrowth.
    - B. Considerable short undergrowth.
    - C. Considerable undergrowth exceeding 4 ft. in height.
  4. Transportation.
    - A. Wagon haul less than 25 miles to supplies.
    - B. Wagon haul more than 25 miles to supplies, or pack train transportation less than 25 miles.
    - C. Pack train transportation more than 25 miles to supplies.
  5. Water.
    - A. Abundant.
    - B. Scarce.
    - C. No water within one day's haul.
  6. General complications of survey.
    - A. Original surveys.
    - B. Boundaries requiring reestablishment, and resurvey of subdivisional lines.
    - C. Retracement-restoration surveys, or metes and bounds survey of private claims within townships being resurveyed.

The general average classification of standard lines and township boundaries are required to be made only upon the completion of such lines from week to week when included in an assignment separate from subdivisional surveys.

The required classifications as to difficulty and cost of survey are separate and distinct from the classifications of land, soil, and timber, which will be required as usual at the end of each mile of field notes.

Monthly progress and expense reports by Surveyors General.

In order to meet the requirements of this office in the administrative direction of the public surveys you are directed to prepare a diagram report showing the status of all assigned, but uncompleted surveys, at the close of every month, and it is urged that these reports be prepared and forwarded promptly at the close of every month, this work taking precedence over all but the most urgent work of your office.

The following general information as to the status of all assigned, but uncompleted surveys, in your district is required to be shown on your monthly diagram reports:

1. The completed miles of survey included in every group.
2. The uncompleted miles of survey included in every group.
3. The dates of survey of every standard or township boundary line.
4. The dates of commencing and completing the subdivisional and other surveys within every township.
5. Cost reports, based on time employed; to be tabulated:
  - a. Aggregate mileage and estimated cost of all standard lines included in a group when completed, based on average per day operating field expenses.
  - b. Aggregate mileage and estimated cost of all township boundary lines included in a group when completed, based on average per day operating field expenses.
  - c. Aggregate mileage and estimated cost of all subdivisional and other surveys within each township as completed, based on average per day operating field expenses.
6. Diagram classification report of surveys in each township as completed.



Final report.

The final diagram report of completed surveys may show in addition to the above tabulated cost and mileage account:

- a. Proper totals of "a", "b", and "c", as indicated above.
- b. Total cost of hire of instruments when not furnished by this office, such cost not to be included in the average per day operating field expenses.
- c. Aggregate cost of hire or estimated depreciation on purchase price of camp outfit, such cost not to be included in the average per day operating field expenses.
- d. Estimated depreciation in value of stock, wagons, or other transportation equipment purchased rather than hired.
- e. Total cost of the preparation of returns of surveys by the surveyors.
- f. Traveling and other total incidental expenses to balance entire field cost of survey as returned in the accounts independent of the disbursements made by this office and the supervising surveyors.

The reports may be greatly simplified by the following scheme:

Three suitable diagrams and a tabulated cost report may be prepared on tracing linen to include:

- a. Diagram of survey to be executed showing the initial and closing lines, heavy, and new work shown in dots or faint dash lines, all with explanatory notes.
- b. Diagram date report.
- c. Diagram classification report.

All may be prepared at a suitable scale, which for small surveys may be shown on the sheet the size of township plats; for the larger surveys it may be necessary to use two sheets in order not to increase the size of sheets over the size of regular township plats. It is desired for the purposes of convenient filing to have all sheets the size of regular township plats, and it will be better to arrange all of the diagrams on one sheet when possible.

Your tracing linen sheet of each group may be kept current with the weekly reports from each camp, and when each sheet is complete in showing the status of a group at the close of a month, four blue prints may be taken for filing, as follows:

1. Commissioner General Land Office.
2. Surveyor General's Office.
3. Supervising Surveyor of Division.
4. Assistant Supervising Surveyor of District.

#### Returns of Surveys.

Upon completion of assignments the supervising surveyor will direct transitmen to proceed to their homes within your district, to prepare the proper sketch plats and field notes of surveys. U. S. Surveyors will be subject to the direction of this office as to the time and place of preparing their returns of surveys.

The returns of surveys will be filed with you when completed and must conform with the requirements of the Manual of 1902 in every particular except as hereinafter modified.

All surveyors are to be cautioned to maintain complete field notes in every particular and to compute all doubtful closings in the field as the work progresses in order that the entire record of survey may always be kept complete to avoid the necessity of returning to the field excepting under the most unusual circumstances. Surveyors will necessarily be placed upon honor and the slightest departure from this trust will be the first cause for immediate dismissal.

#### Modifications to the Manual of 1902.

"Standard Field Tables": This office will have ready for distribution at a very early date a supplement to the Manual entitled "Standard

Field Tables", arranged for pocket use in the field, which volume contains every standard table and formula necessary in the execution of public surveys. These tables are to be distributed to every U. S. surveyor and transitman, and upon requisition to you the tables may be supplied to principal assistants in parties. The "Standard Field Tables" should also be distributed to the Deputy Surveyors engaged in executing outstanding contracts.

"Ephemeris of the Sun and Polaris, and Tables of Azimuths of Polaris": This office will have ready for distribution also at a very early date a new annual, a supplement to the Manual bearing the foregoing title, containing every function of the Sun or Polaris necessary in the determination of the true meridian by approved methods.

Measurements: In addition to the method of measurement prescribed by the Manual this office hereby approves the use of long steel tapes in measurements on the slope with/proper reduction to true horizontal distances for the use of clinometers in the determination of slope angles with entry in the official field notes, the fact of the use of the long steel tape and clinometer method to be stated in the field notes. This office hereby approves a restricted use of the stadia method of measurements over surfaces that can not be accurately measured with the steel tape, the record of the test of the stadia wire interval to distinctly appear in the field notes as often as once a week when used, and the essential part of the record of every stadia measurement to appear in the field notes.

Instruments: The measurements used in the surveys must conform to the requirements of the Manual and the certificate of the approval of every instrument by a designated supervising surveyor must appear in the field notes as heretofore required in regard to your approval of instruments used in the execution of contract surveys.

Approved methods of observation to determine the true meridian:

1. Polaris at elongation.
2. Polaris by the hour-angle method, with record of independent time observation.
3. A series of three altitude observations of the sun for azimuth, taking the resulting mean.
4. A series of three equal-altitude observations of the sun for meridian, taking the resulting mean.
5. The solar attachment properly adjusted to hold the true meridian at all approved hours of solar work within 1'30" of the true meridian as determined by other approved methods as outlined above.

Approved methods of observation from which to determine correct local mean time for use within 24 hours in hour angle observations of Polaris:

1. Altitude observation of the sun.
2. Meridian observation of the sun.
3. Comparison with the standard telegraphic clock.

The essential elements of all azimuth and time determinations must appear in the field notes but the field notes do not need to be unnecessarily elaborated to show the detailed process of reductions.

Approved corner monuments. Iron post corners are hereby required to be witnessed by bearing trees excepting only the absence of sound trees of suitable size within a distance of 3 chains.

When impracticable to use iron posts the best native stone if of proper quality may be used as prescribed in the Manual.

When impracticable to use iron posts or suitable native stone, wooden posts, witnessed by bearing trees, may be used as prescribed in the Manual.

The usual accessories provided in the Manual are required at all corners.

Blazing of trees: The provisions of the Manual in regard to the blazing of tree trunks must be strictly complied with, excepting only the blazing of trees having branches growing to the ground, the expense of blazing such trees being prohibitive.

Cutting of undergrowth: All undergrowth must be sufficiently removed to permit the proper projecting of all lines, and within distances of 5 chains of all corners and within 2 chains of lines of travel the undergrowth must be sufficiently removed to enable the settler and other interested people to immediately identify the true line of survey. It is obvious that the same requirement must apply to the true line of survey over tops of ridges.

Sketches: All surveyors are required to comply with the requirements of the Manual in regard to topographic sketches which must be kept upon line as the field work progresses.

Until otherwise arranged U. S. Surveyors Arthur D. Kidder and Sidney E. Blout are detailed respectively to supervisory and assistant supervisory duties in your district.

Very respectfully,

(S. V. Proudfit)

Acting Commissioner.

E. G. S.

(COPY)

In reply please refer to "E" 10-76800 A.S. (Horton)

A.S.

DEPARTMENT OF THE INTERIOR, C.L.D.B.

GENERAL LAND OFFICE,

WASHINGTON, November 8, 1910.

Surveys, Group 1, Colorado, A.C.Horton, Jr., U.S.S.

U.S. Surveyor General,  
Denver, Colorado.

Sir:

I am in receipt of your letter dated September 30, 1910, transmitting complete returns of the survey of T. 14 S., R. 100 W., 6th P.M., Colorado, (Group 1), executed by Mr. A. C. Horton, Jr., U. S. Surveyor, and Jay P. Hester, Transitman, under special instructions of July 14, 1910, consisting of one original plat to be photolithographed and two books transcript field notes, A and B.

You state that no segregation sheets of Miner's claims have been made for the reason that you have not been advised if patents to Sur. No. 18741 of Metallic and Bimetallic lodes, and Sur. No. 18744, Echo and Nighthawk lodes have been issued or not.

You also state that Mr. Arthur D. Kidder, U. S. Supervising Surveyor, reports that the manner of executing this complicated and extremely rough survey is especially satisfactory to him.

The returns of this, the first survey under the new system, have been most critically examined, and it is found that no reason is assigned why the survey of the east boundary of T. 15 S.,

R. 100 W., provided for under the instructions of July 14, 1910, was not executed, and why the survey of the east boundaries of Ts. 14 and 15 S., R. 100 W., was not executed in the manner required by the instructions, by initiating said survey at the standard cor. of T. 15 S., Rs. 99 and 100 W. If any modification of said instructions or supplemental instructions in reference to said line have been issued by competent authority this office has not been advised, and, while the propriety and accuracy of the survey of the east boundary of T. 14 S., R. 100 W., as established, is not questioned, a good and sufficient reason for departure from the special instructions should be required and embodied in the field notes. However, in all future cases, any material departure from the instructions should first have proper official authorization.

In the subdivision of this township, at all points where the survey is discontinued the surveyor has failed to state the reason why the survey was discontinued, and, in the future, you will require the surveyors to describe the land beyond as non agricultural, mountainous, heavily timbered, scrub timber, barren, &c. as the case may be, as the reason why the lines are not extended.

Aside from these omissions noted this extremely rough and difficult survey appears to have been so well and acceptably executed that it deserves the commendation of this office. The field notes are complete, concise and accurate in every detail, except the clerical omission of the point for  $\frac{1}{4}$  Sec. Cor. at 40.12 chs., on the N. boundary of sec. 2, Bk. A, page 4, which you will supply.

The plat submitted for photolithographing, contrary to the usual practice of your office, is poorly executed in respect to topography, non notation of timber and other features, and a new plat should be constructed by a competent topographical draftsman who is familiar with this class of work. East creek which is from 2 to 10 links wide is drawn 1 chain wide, the draws, gulches, roads &c., are too heavy and course for photolithographing. Unawep Canon 600 to 700 ft. deep, its walls almost precipitous is not defined, and divides, spurs and hills do not show their relative elevation and direction by proper arrangement of hachures. In this connection I would suggest that if the model plat (plate 3 of the Manual) be followed, in respect to execution of hachures, it will be satisfactory to this office.

The returns of this survey have been specially and critically considered for the purpose that, with your co-operation, returns of surveys, hereafter, shall conform and be on a par with the excellence of the field work of the surveys anticipated under the present system and laws.

In respect to the Mineral Surveys you are advised that Sur. No. 18741 of the Metallic and Bimetallic lodes have been patented, and that Sur. No. 18744, Echo and Nighthawk lodes are being adjudicated, and not yet patented.

In respect to the Exterior lines, where only one township is involved and the township is concurrently subdivided by the same surveyor or surveyors, no separate Exterior diagram will be required.

The returns of this survey, 1 Tp. plat and 2 books field notes, are herewith, under separate cover, returned to your office,



to be resubmitted with a new plat, constructed upon lines before indicated and with segregation sheet of patented mineral claims.

Very respectfully,

(Signed) Fred Dennett,

Commissioner.

FAS.

DEPARTMENT OF THE INTERIOR,

REGISTER.

OFFICE OF U. S. SURVEYOR-GENERAL.

Denver, Colorado, November 16, 1910.

Mr. Arthur D. Kidder,

U. S. Surveyor and Supervisor,

R.F.D. No. 3, Terre Haute, Indiana.

Sir:

The first returns under the new system having been commented upon by the Hon. Commissioner, I inclose herewith a copy of his letter dated November 8, 1910, together with 2 books transcript field notes, A and B, township plat, Mr. Horton's field sketch, also model plat (Plate III of Manual), to guide you in following the criticisms and recommendations in the Commissioner's letter, and copy of reply to same, from this office.


I regret this severe criticism of the township plat very much, and have endeavored to explain our position in the matter, trusting it will be satisfactory to the Department. After reviewing same, will you kindly return inclosures at your earliest convenience, in order that this office can comply with the General Land Office directions.

Any comments from you upon this subject will be appreciated.

Very respectfully,

Inclosures.

YCE-FAI.

  
Surveyor General.

(COPY)

DEPARTMENT OF THE INTERIOR,

10-73800

"E" A.S.

OFFICE OF U.S. SURVEYOR GENERAL,

re criticisms

first survey  
under new system;

DISTRICT OF COLORADO,

Group 1, Colorado,

Denver,

November 16, 1910.

A.C. Horton, Jr., U.S.S.

MCB.

Commissioner of the General Land Office,

Washington, D.C.

Sir:

Referring to your letter dated November 8, 1910, entitled "Surveys, Group 1, Colorado, A.C. Horton, Jr., U.S.S.", returning the original plat of T. 14 S., R. 100 W., 6th P.M., Colorado, and 2 books of field notes, to be re-submitted, with new plat constructed along different lines, I have the honor to report that:

1st: Under Annual Instructions to this office, dated July 16, 1910, the U. S. Supervisor, designated from the roll of U.S. Surveyors to act in the capacity of technical administrative field assistant to your office, under the present system and laws, exercised his judgment and experience in promoting efficiency in the field work of above mentioned Group, examined field-sketch plat, and original draft of field notes, the same meeting with his entire approval. He then requested this office to prepare and transmit said returns to you at the earliest practicable date, it being the first survey to be completed under the new system, and the desire existing to complete all features through to acceptance; therefore, minor points in Mr. Horton's notes were passed over in order to prevent delay.

2nd: Mr. Horton deemed it advisable (in accordance with his interpretation of the Special Instructions) to abandon the

(Hon. Commissioner, No. 2)

survey of the E. bdy. of T. 15 S., R. 100 W., because he was unable to find either agricultural land or settlers in said township, the entire Tp. being exceedingly rough and mountainous, and the greater portion covered with heavy timber.

South from the corner of Tps. 14 and 15 S., Rs. 99 and 100 W., a line would descend over a series of abrupt sandstone ledges, into an almost inaccessible canon, and thence over barren, mountainous land. For this reason, and because of the excessive heat, cost and delay incident to projecting this line, he recommended that the survey of same be excluded. By running South on random line 480.00 chs. from the corner of Tps. 13 and 14 S., Rs. 99 and 100 W., thence West to an intersection with the corner of Tps. 14 and 15 S., Rs. 100 and 101 W., a satisfactory fixation of the Exterior was obtained.

3rd: Under the old system, a contract was rarely executed absolutely according to Special Instructions, the deputy often finding conditions in the field we had not anticipated when writing same. We placed the deputy upon his honor, however, expecting him to use his judgment and experience, and a violation of this trust was a serious offence, which would undoubtedly be uncovered by the Examiner in his field inspection. The deputy would, of course, state his reasons why (should he depart materially from his instructions), to this office, and when the Examiner entered upon duty in his field inspection, the deputy's report, and office data, were handed him to corroborate the statements made.

(Hon. Commissioner, No. 3)

Under the new system, Mr. Horton was advised, when expedient, to refer all field questions to the Supervising Surveyor, he having examined the progress reports, field notes, etc., with a view to the "method and order" of Mr. Horton's procedure, and being satisfied with same, this office did not require the surveyor to make the statement in the field notes you now consider necessary.

4th: You direct that the surveyor be required to give the reason why the survey of any subdivisional line is discontinued. This, occurring several times in the subdivision of the Tp., it was thought that the surveyors statement at the end of his notes "The portion of the township left unsurveyed contains no agricultural land", would be sufficient in this case.

5th: In regard to the omission of "point for  $\frac{1}{4}$  sec. cor. at 40.12 chs., on the N. bdy. of sec. 2", the surveyor was making a re-establishment, only, of this line, and having re-established the old witness  $\frac{1}{4}$  sec. cor., it was not considered absolutely necessary to mention "point for  $\frac{1}{4}$  sec. cor. at 40.12 chs."

6th: Referring to your criticism of the original Tp. plat submitted you for photolithographing, I beg to assure you, it is my desire that the high standard of work executed by this office - and usually commended by you - be maintained, as in the past, and this plat, as prepared, was no exception to the rule, considering the limited time allowed the draftsman, and the desire on the part of this office to keep up with the current

(Hon. Commissioner, No. 4)

work of this Division, with 4 people, only, making original plats.

Regarding your criticism of said plat: that East Creek being but 2 to 10 lks. wide is drawn 1 chain wide; that the topographical features - Unaweep Canon, divides, spurs, hills, etc., showing proper relative elevation and direction - are lacking; also notation of timber, etc.; I have the further honor to state that it has been the practice of this office to draw in the principle drainage of a township, heavy, exaggerating widths in order to give some character to the drainage. Mr. Horton, however, did not give the width of bed of stream, but number of links of water, only. An attempt to draw in the main stream of a township, to scale, if but two links wide, would be a fine hair line, which we have learned from experience does not photolithograph well. The first duplicate and triplicate photolithographic copies submitted to this office were extremely poor, and upon examining the "originals" of same, found the lines too weak for photolithographing. The Hon. Commissioner, being present in this office at that time, suggested that hereafter all originals made for photolithographing show clear and well defined lines.

The topography suggested by you, referring to model plat (Plate III of the Manual), in respect to execution of hachures, has not been attempted by this office, as the great volume of resurvey work has not warranted the time necessary to do this, former Inspector Macey particularly requesting that the topography and shaded lettering on said model be dispensed with (no hachures being

(Hon. Commissioner, No. 5).

allowed to interfere with course and distance of boundaries of a section; see lines of Sec. 3), in order that better results could be obtained in expediting the work, and suggesting single stroke lettering and a general outline of topography, only. Very few returns to this office give sufficient data upon which to base the mapping of topography of this nature, and while Mr. Kerton's notes are more complete than the usual returns in this respect, we did not depart from the usual practice.

Regarding the omission of timber from the plat, this office has been directed to show timber of commercial value only, the surveyor stating in the "general description" that the timber is valuable for fuel only, with but scattering pine in certain sections, therefore, did not indicate same on township plat.

Other criticisms on margin of plat, such as never writing the course of a line but once, even if found convenient to do so in arranging the work, and omitting the township and range on sections adjacent to the township platted; I again have the honor to state that this office has simply followed the usual custom, also verbal requests from those in authority at Washington, the latter practice originating in platting "metes and bounds" surveys, overlapping into the adjoining township, thereby materially aiding the settler who is not familiar with the townships and ranges.

In conclusion, I would say that after carefully reviewing your remarks, criticisms and recommendations, regarding this first survey under the new system, I respectfully submit the above, for

(Hon. Commissioner, No. 6).

your consideration, in justice to this office. In the meantime, I will refer your letter to the Supervisor of this district - Mr. Kidder - suggesting the advisability of requiring surveyors to send in better sketch plats, as to topographical features of a Tp., to aid the draftsmen in clearly interpreting the field notes, and mapping same, also calling his attention to omissions made by Mr. Horton, and your requirements regarding same.

You have my hearty co-operation in returns being on a par with the excellence of the field notes, which this office repeatedly returns to the surveyor to correct and bring up to the standard required. The plat in question will be reconstructed along the lines you desire, and re-submitted, together with the field notes, also duplicate plat of segregation sheet, showing patented mineral claims. In this connection, however, I earnestly recommend that this office be permitted to continue our usual practice in making plats (which have been commended by you, and are highly satisfactory to the public), until an appropriation is made for a larger force of draftsmen.

Very respectfully,

FAL.

Surveyor General.



R.F.D. No. 3, Torre Haute, Ind., December 7, 1910.

General Instructions, Returns of Surveys.

The U. S. Surveyor General,

Boise, Idaho, and Denver, Colorado.

Sir:

You are respectfully requested to communicate with the various U. S. Surveyors and Transitmen in your district in regard to the following general plan to be pursued in the preparation of the returns of surveys to be filed with you:-

SKETCHES.

Plats and sketches are to be prepared in all respects as required by the Manual and your special instructions; all surveyors should endeavor to maintain the highest standard of work in the preparation of plats and sketches as practiced by deputy surveyors with such improvements from time to time as may be suggested by you.

FIELD NOTES.

It has been provided that typewritten field notes shall be returned, prepared in all respects as required by the Manual and your special instructions, but it does not appear to be in the interest of economy to furnish typewriters to surveyors at the present time nor to authorize surveyors to employ typewriter operators, nor are all of the surveyors sufficiently familiar with the requirements of the Manual in this respect to justify

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the expense of typewriting their notes prior to an official review of the surveyors' original draft. It therefore appears to be expedient and in the interest of economy to modify the prior instructions as follows:

Surveyors who own or have the use of typewriters and who are intimately familiar with the requirements of the Manual in respect to the preparation of field notes are authorized to submit typewritten field notes, the use of typewriters to be without additional expense to the General Land Office, the notes to be prepared in all respects as required by the Manual and your special instructions, and when reviewed and found satisfactory such notes will become the original field notes of the survey and as such will become a part of the regular files of your office as heretofore.

It will be optional with all surveyors to prepare a preliminary draft of their notes, in which process the notes will be required to conform in general plan to the requirements of the Manual and your special instructions, to the best ability of the surveyor; the notes may be written in long-hand without abbreviations except as allowed by the Manual, the notes must be in regular form and complete in every respect, written on ruled field note paper, but written on one side only, every mile to be commenced on a new page to facilitate correction and rearrangement, and altogether prepared in such a manner that when reviewed, corrected, and placed in satisfactory condition by you, the preliminary draft may be handed to an expert typewriter operator to be copied, straight copy, becoming then the original notes.

In order to reduce the labor of copying fixed phrases occurring over and over again in the field notes I have selected a set of eight rubber stamps comprising in all twenty two lines of fixed expressions repeatedly appearing in all field notes, these stamps being provided with blank spaces for filling in appropriate numbers or descriptions. I have ordered sent to you by mail <sup>twelve</sup><sub>six</sub> sets of these stamps, each set containing eight rubber stamps, one pad, and one can of quick drying ink; the manufacturers, Messrs. Lamb and Tildon, Washington, D. C., reported that these outfits were mailed to you on Dec. 5th; the surveyors may be furnished with these outfits, the same to be returned to you when their usefulness is fulfilled. I have also requested the Honorable Commissioner of the General Land Office to send to you <sup>twelve</sup><sub>six</sub> stamps of general use in showing fac-simile marks on iron posts, optional with surveyors instead of using the descriptive detail of the marks.

The above method offers several advantages, the first draft can be prepared much faster than to write the field notes on the typewriter first hand, the first draft can be easily corrected as necessary after which the notes can be typewritten for official filing, and it should be seldom indeed that further corrections are necessary.

Ruled field note paper is furnished regularly by the Honorable Commissioner, but this comes in four-page sheets, these should be cut to single sheets only, each sheet or page appropriately headed or titled, and written upon on one side of the sheet only.

The first draft of field notes prepared in the above manner is to be officially filed with you for review similar to the review

given to the field notes returned by deputy surveyors, but more latitude is now permissible in making corrections, and the above plan is outlined with every facility for making corrections which in your opinion may be necessary. The review given to the preliminary draft of field notes will be the same detail review heretofore given to the field notes returned by deputy surveyors, and after fully corrected the preparation of the typewritten "original" field notes for official filing becomes only a question of correct transcribing. You may find that the regular force of your office can do this typewriting, but if the volume of such work becomes too great to be taken care of along with the regular work of your office I will endeavor to make special provision for relief when necessary.

No authority exists at the present time for expenditures for office rent so that after you have exhausted the limited spare desk accommodations of your office the surveyors will be required to make personal arrangement for desks without expense to the General Land Office; surveyors are allowed their transportation expenses returning from the field to their homes, after which the responsibility of the General Land Office properly ceases except for time employed, and employees are expected to render diligent service in the preparation of their field notes and plats, a lack of diligence or efficiency in their office work will exclude transients from future employment.

Very respectfully,

*Arthur W. Hedder*

U. S. Surveyor and Supervisor.