

Mineral Surveys

DISTINGUISHING FEATURES OF THE MINERAL SURVEY

10-1. This chapter sets out the field and office procedure to be followed in the execution of *mineral surveys*, and the filing of the returns. These surveys are made to mark the legal boundaries of mineral deposits or ore-bearing formations on the public domain where the boundaries are determined by lines other than the normal subdivision of the public lands.

Mineral surveys are required most frequently where the deposits occur in ore-bearing rock veins, known as mineral lodes, where the prospector who has made a legal discovery is permitted to stake out a claim of specified dimensions, to develop the same to his exclusive use, and, if desired in the protection of his right, to apply for a mineral survey and obtain a patent.

R.S. 2331 (30 U.S.C. 35) provides that all placer-mining claims located after May 10, 1872, shall conform as nearly as practicable with the United States system of public land surveys and the rectangular subdivision of such surveys, and such locations shall not include more than 20 acres for each individual claimant. Surveys of placer claims are conformed to the public survey unless they are located on unsurveyed land or the configuration of the mineral deposit makes conformation impracticable. Consequently, the mineral survey procedures apply especially to lode claims although they are followed generally in appropriate surveys of placer claims.

Millsites embracing land occupied for milling purposes or used incidental to mining operations may be located, surveyed, and patented in a manner similar to lode claims.

The early discoveries of free gold were made far in advance of settlement, mainly in the stream beds of the western territories that included the Black Hills, the Rocky Mountains, and the Pacific Slope. Mineral deposits in these regions were appropriated and their values extracted under varied local camp or mining district rules with the tacit approval but without any regulations by the Federal Government. Finally, with the spread and development of the mining industry, Congress adopted legislation not only recognizing the possessory right of citizens of the United States to minerals on public lands (R.S. 910; 30 U.S.C. 53), but also providing for their disposition. (R.S. 2319-2340 and 2343-2344; 30 U.S.C. 22-24, 26-30, 33-43, 46, 47, 51, 52). Present procedures are derived from this basic legislation.

10-2. Subsequent legislation has necessitated a detailed revision of the regulations governing the administration of mineral surveys, but the field surveying operations remained fixed.

The appointment and bonding of mineral surveyors, suspension or revocation of their appointments, payment for their services, employment of their assistants, and the cost of office work to mineral claimants, including refund of unearned deposits, are matters of internal office procedure. Rules for these administrative procedures and also the procedures for locating, maintaining, and obtaining patent to mining claims are contained in the Code of Federal Regulations, Title 43.

The order for a mineral survey issues from the state office administering the public lands where the claim is located.

REQUIREMENTS OF FIELD WORK

10-3. The mineral survey includes not only the usual technical procedure but also the examination required for preparing affidavits of the value of expenditures for development purposes and any other reports to be made by the mineral surveyor.

10-4. The survey must be an actual survey on the ground in full detail, made by the mineral surveyor in person after the receipt of the order. It must be made without reference to any knowledge he may have previously acquired by having made the location survey or otherwise. The record must show the actual facts existing at the time of the survey. This precludes a calculation of the connections to corners of the public survey and to location monuments, or of any other lines of the survey, through prior surveys, unless it is satisfactorily shown in his report that he has retraced such lines and found them to be correct. *Veta Grande Lode*, 6 L.D. 718 (1888); *Lincoln Placer*, 7 L.D. 81 (1888).

10-5. The survey of a mining claim may include several contiguous locations owned in common, but in conformity with statutory requirements the survey record must distinguish the several locations and exhibit the boundaries of each. *S.F. Mackie*, 5 L.D. 199 (1886); *Golden Sun Mining Co.*, 6 L.D. 808 (1888); *Argillite Stone Co.*, 29 L.D. 585 (1900).

10-6. Lengths of lines are returned as their true horizontal equivalents in the *foot unit*, as determined by the methods of measurement prescribed in chapter II. The high degree of accuracy required in making mineral surveys calls for careful steel-tape measurements or the use of an electronic measuring device. If needed for acceptable results, a spring balance should be used and temperature corrections applied when measuring with the steel tape.

10-7. Mineral surveys must be made with an instrument by which the meridian may be determined independently of the magnetic needle, and the directions of lines must be referred to the true meridian. A transit with or without a solar attachment may be used in any of the methods described in chapter II. The true course of at least one line of each survey is to be ascertained at the time of the survey by observation of the sun, Polaris, or an equatorial

star with proper verification of the time and latitude. The methods employed and the results are recorded in the field notes of the survey. Specimen field notes of a mineral survey will be found in the appendix.

10-8. The magnetic declination is to be noted at each corner of the survey. If it is the same at the several corners, that fact and the value of the declination are stated in the field notes. The magnetic declination must be noted and recorded at each corner of the survey where differences are found.

10-9. The survey must be made in strict conformity with, or be embraced within, the lines of the location upon which the order is based. If the survey and location are identical that fact is to be clearly stated in the field notes. If not identical, a bearing and distance are to be given in the field notes from each established corner of the survey to the corresponding corner of the location. The lines of the location as found upon the ground should be laid down upon the preliminary plat only in such manner as to contrast and show their relation to the lines of survey. *Philip Dephanger*, 1 L.D. 581 (1882).

10-10. The survey is given but one number. A location under the mining laws can legally be made only of a tract or piece of land embraced within one set of boundary lines. Two or more tracts merely cornering with each other cannot legally be embraced in a single location. *Gomeira Placer Claim*, 33 L.D. 560 (1905); *Hidden Treasure Mine*, 35 L.D. 485 (1907). An owner of several claims who has received patent for certain contiguous claims in the group may apply for patent to the remainder in one application, even though they are not contiguous to each other, if each is contiguous to the body of land embraced in the patented claims. *Wagner Assets Realization Corp.*, 53 L.D. 614 (1932).

10-11. In accordance with the principle that courses and distances must give way when in conflict with fixed objects and monuments, the mineral surveyor may not change the corners of the location for the purpose of making them conform to the description in the record. If the difference from the location certificate is slight, it may be explained in the field notes, as indicated in the specimen field notes.

10-12. R.S. 2324 (30 U.S.C. 28), expressly provides that "the location must be distinctly marked on the ground so that its boundaries can be readily traced," and "that all records of mining claims made after May 10, 1872, shall contain the name or names of the locators, the date of the location, and such a description of the claim or claims located by reference to some natural object or permanent monument as will identify the claim." Each location certificate should give the name of the location.

10-13. A single discovery working cannot support more than one location, *Poplar Creek Mine*, 16 L.D. 1 (1893), unless the vein or lode can be traced on outcroppings on contiguous claims.

10-14. These provisions of law must be strictly complied with in each case to entitle the claimant to a survey and patent. Should a claimant under a location made subsequent to May 10, 1872, who has not complied with said requirements in regard to marking the location upon the ground and recording the location certificate, apply for a survey, the mineral surveyor must decline to make it prior to reporting the facts to the survey office and receiving further instructions. *Philip Dephanger*, 1 L.D. 581 (1882).

10-15. If after having obtained an order for survey the applicant should find that the record of location does not practically describe the location as staked upon the ground, he should file a certified copy of an amended location certificate, correctly describing the claim, and obtain an amended order for survey. In fact any change in the original order including the addition or dropping of locations or designation of a different surveyor calls for an amended order.

10-16. If the survey is applied for under a location made prior to May 10, 1872 (see R.S. 2319-2328, 2331), the mineral surveyor is governed by the special instructions accompanying the order for survey.

LODE LINES AND END LINES

10-17. No lode claim located subsequent to May 10, 1872, may exceed the statutory limit of 300 ft. in width on each side of the center of the vein, or 1,500 ft. in length. All surveys

must close within 0.50 ft. in 1,000 ft., and the error must not be such as to make the claim exceed the statutory limit. In the absence of proof to the contrary, the discovery point is held to be the center of the vein on the surface. The course and length of the lode line or presumed course of the vein should be marked upon the plat and specifically described in the field notes. The record of the intersections of the end lines with the lode line are given in the field notes from the lowest numbered corner on each end line running toward the next higher numbered corner. Where conditions permit, the distances are shown on the plat.

10-18. It was held in *Beliggerent and Other Claims*, 35 L.D. 22 (1906), (syllabus), that —

There is no warrant in the mining laws for extending, arbitrarily and without any basis of fact therefor, the vein or lode line of a location in an irregular and zigzag manner for the purpose of controlling the length or situation of the exterior lines of the location to suit the convenience, real or imagined, of the locator.

The end lines of a lode location must be straight and parallel to each other and when at right angles with the side lines may not exceed 600 feet in length.

The mining laws contemplate that the end lines of a lode claim shall have substantial existence in fact, and in length shall reasonably comport with the width of the claim as located.

METHOD AND ORDER OF PROCEDURE

10-19. The position of the official survey upon the ground is fixed by connecting it by course and distance either to a corner of the public survey, preferably the nearest, or to a location monument. In either case the connecting line may not exceed a length of 2 miles. If both a corner of the public survey and a location monument are within the limiting distance, the connection should, if practicable, be made to the public survey corner. Each location of a survey embracing two or more locations must be so connected.

10-20. When a mining claim is situated within the limits of a township the survey of which is in good standing, but where no corner of the survey can be found within 2 miles of the claim, after diligent search, connection may be made with a location monument, which in

turn must be connected with an established public survey corner.

10-21. As a matter of convenience in the preparation of subsequent metes-and-bounds descriptions it is preferable that the corner of each location from which the connection is made be established as corner No. 1.

10-22. The three preceding sections are intended to permit the surveyor to obtain connections in a practicable manner based upon existing field conditions. Any unusual conditions that may be encountered in obtaining connections should be explained in the field notes.

10-23. From corner No. 1 the successive boundaries of each location are run in regular manner, numbering the remaining corners in consecutive order.

10-24. A lode and a millsite embraced in one survey are distinguished by the letters A and B, respectively, following the number of the survey. The corners of the millsite are numbered independently of those of the lode. A corner of the millsite, preferably corner No. 1, is connected with a corner of the public survey or location monument, and a corner of the millsite with a corner of the lode claim.

10-25. When a placer claim includes lodes, or when several contiguous placer or lode locations are included as one claim in one survey, the corners of each location are given a separate consecutive numerical designation, beginning with corner No. 1 in each case. The placer claim should be described in the field notes before describing the lodes.

CONFLICTS

10-26. When an exterior line of a claim intersects the surveyed line of another claim, the field notes must show (1) the distance to the point of intersection and (2) the course and distance along the line to a corner of the conflicting claim. Where a corner of the conflicting survey falls within the claim being surveyed, this corner should be selected from which to give the tie. When the same line of a conflict is intersected by two lines of the survey, the tie is given from the same corner of the conflicting survey at both intersections.

10-27. When the lines of two locations of the survey intersect, only the point of intersection is given on the line being described.

10-28. Conflicts with unsurveyed locations are not reported unless excluded from the area claimed.

10-29. Surveyed claims owned by the applicant, in conflict with or contiguous to the survey, must be reported in the field notes.

10-30. A connecting line should be run from some corner of the survey to a corner of each conflicting survey, also to a corner of each conflicting unsurveyed location that is to be excluded.

10-31. Connection is also made to any survey, the record position of which is within 100 feet of the lines of the survey being executed; also to any other neighboring survey, the location of which is not definitely fixed by the record. Such connections should be made and conflicts shown according to the boundaries of the neighboring or conflicting claims as each is marked, defined, and actually established upon the ground.

The field notes must fully and specifically state how and by what visible evidence the several conflicting surveys were identified on the ground, as well as those which appear to conflict, according to their returned tie or boundary lines, and report all material errors or discrepancies found in such surveys. In the survey of a group of contiguous claims where any corners are common to two or more claims of the group, bearings should be mentioned but once and the corner described as a common corner in the claim first mentioned in the field notes.

LOCATION MONUMENTS

10-32. When a survey is situated in a district where there are no corners of the public survey and no other monuments within 2 miles, a location monument is established. The site, when practicable, should be some prominent point, visible from every direction, where the permanency of the monument will not be endangered by snow, rock, or land movements or other natural causes. The geographic position of the location monument is recorded in the field notes. The latitude and longitude should

be determined as accurately as the known data and the instruments used will permit.

10-33. The monument should consist of an iron post similar to the type used for rectangular surveys or a stone not less than 30 inches long, 20 inches wide, and 6 inches thick, set three-fourths in the ground with a conical mound of stone 4 feet high and having a 6-foot base alongside. The letters "USLM" followed by the number of the survey are marked on the brass cap or plainly chiseled upon the stone. The exact reference point is indicated on the top of the monument by a cross. Any necessary departure from the prescribed material and size of monument is to be explained.

10-34. From the monument the precise course and distance is to be taken to two or more bearing trees or rocks, and to any well-known and permanent objects in the vicinity, such as buildings, shafts, mouths of adits, prominent rocks, or the confluence of streams. Bearing trees are scribed "BT" and the bearing rocks chiseled "BO" together with the number of the location monument. The exact point on the tree or stone to which connection is made is indicated by a cross or other unmistakable mark. Bearings should also be taken to prominent mountain peaks or other landmarks and the approximate distance and direction ascertained to the nearest town or mining camp. A detailed description of the location monument, with a topographic map of its location, is to be furnished in the record of the survey.

CORNER MONUMENTS

10-35. Corner monuments may consist of the following, given in the order of preference:

(1) Tubular iron post with flared base and brass cap for marking with steel dies of the type adopted for public land surveys.

(2) A stone at least 24 inches long, 6 inches wide, and 4 inches thick, set 16 inches in the ground, with a conical mound of stone, 1½ feet high, 2-foot base, alongside; or,

(3) A rock in place.

If none of these is available, a concrete post, at least 24 inches long, 6 inches square, set 16 inches in the ground, and surrounded by a sub-

stantial mound of earth or stone, may be used. If it is necessary to vary from these instructions, the returns should contain an explanation.

10-36. All corners must be monumented in a permanent and workmanlike manner. The monument is marked by stamping the distinguishing initial letter or letters, corner numbers, and survey numbers on the cap of a brass-capped monument. The marks on a stone or post are chiseled on the sides facing the claim or claims. The precise corner point is permanently indicated on the monument. When a rock in place is used, its dimensions above ground should be stated, and a cross chiseled at the exact corner point. Corners common to two or more locations are marked with the initial letter and corner number of each location.

10-37. In case the point for the corner is inaccessible or unsuitable, a witness corner is established, which will bear the letters "WC" in addition to the regular markings. When practicable the witness corner should be located upon a line of the survey and as near as possible to the true corner point, with which it must be connected by course and distance. The reason for the establishment of a witness corner should be stated in the field notes.

10-38. The position of each corner should be recorded by course and distance to bearing trees, rocks, and other permanent objects, as prescribed in the establishment of location monuments, and when no objects are available the field notes should so state. In the latter event a memorial, if practicable, should be deposited at the corner and described in the field notes.

TOPOGRAPHY

10-39. The topographic features of the claim should be noted carefully. Distances on the lines are shown to intersections with all streams, gulches, ditches, ravines, trails, etc., with their widths, courses, and other data required for mapping. If the claim lies within a townsite, all important municipal improvements, and the street and block system, within the claim should also be located for mapping purposes.

FIELD NOTES AND PRELIMINARY PLAT

10-40. Field notes and other reports must be typewritten in black-record ink, and upon the proper blanks, which are furnished with the order for survey or upon application. No interlineations or erasures are permissible, and no abbreviations or symbols may be used excepting those shown in section 8-11 and as employed in the specimen field notes in appendix II.

10-41. The mineral surveyor prepares and files a preliminary plat on tracing cloth, drawn on a scale of 200 feet to an inch, if practicable, in conformity with the specimen plat (insert No. 2), the lines of the claim surveyed being shown heavier in contrast with conflicting claims. A copy of calculations of areas (made by double meridian distances) and of all triangulations or traverse lines should also be furnished.

10-42. In order that the results of the survey may be reported in a uniform manner, the field notes and preliminary plat are to be prepared in strict conformity with the specimen field notes and plat. These are designed to furnish all needed information concerning the manner of describing the boundaries, corners, lode lines, connections, intersections, conflicts, and improvements, and of stating the magnetic declination, area, location, and other data connected with the survey of mineral claims, and to prescribe certain forms of certificates for the surveyor, and for listing his assistants.

10-43. Throughout the description of the survey, after each reference to the lines or corners of a location, give the name thereof, and if unsurveyed state the fact. If reference is made to a location included in a prior official survey, the survey number is given, followed by the name of the location.

10-44. The total area of each location in a group embraced by its exterior boundaries, and also the area in conflict with each intersecting survey or claim, should be stated. When locations of the survey conflict with each other, such conflicts should be stated only in connection with the location from which the conflicting area is excluded.

10-45. The field notes and plat of survey should not show exclusions, or attempt to specify

the net area of the claim. These are matters for the applicant to state in connection with his application for patent, and the notices posted and published. The field notes should merely show the total and net areas of conflict, so that any exclusion desired may be made readily.

10-46. The field notes should state specifically whether the claim is upon surveyed or unsurveyed public lands, giving in the former case the quarter section, township, and range in which it is located, and in the latter the township and range as nearly as can be determined by the information at hand. When upon surveyed lands, the section boundaries should be indicated by full lines and quarter sections by broken lines.

10-47. The title-page should contain the post-office address of the claimant or his authorized agent.

IMPROVEMENTS

10-48. In R.S. 2325 (30 U.S.C. 29), it is directed that at least \$500 shall be expended upon a mineral claim as a prerequisite to patent.

10-49. In preparing the certificate of the value of the improvements, the form shown in the specimen field notes is followed.

10-50. Only actual expenditures and mining improvements made by the claimant or his grantors, having a direct relation to the development of the claim, are to be included in the estimate. Labor performed or improvements made outside the boundaries of the claim are within the meaning of the statute when they facilitate the extraction of the metals in the claim. *Emily Lode*, 6 L.D. 220 (1887).

10-51. The expenditures required may be made on the surface or in running a tunnel, drifts, or crosscuts for the development of the claim. Improvements of any other character, such as buildings, machinery, or roadways are excluded from the estimate unless it is clearly shown that they are associated with actual excavations, such as cuts, tunnels, and shafts, and are essential to the practical development and to actually facilitate the extraction of mineral. Mills for ore treatment, or roadways, tramways, or trails built for transporting the extracted ore from the mine, are not to be included.

10-52. All mining and other improvements on the claim are located by course and distance from corners of the survey, or from points on the indicated lode line, specifying with particularity the dimensions and character of each. The improvements upon each location should be numbered consecutively, the point of discovery always being No. 1. Improvements made by a former locator who has abandoned his claim are not to be included in the estimate, but should be described by separate statement in the field notes and shown on the plat.

10-53. The field notes should show in detail the value of each mining improvement included in the estimate of expenditures, and when a tunnel or other improvement has been made for the development of other claims in connection with the one for which survey is made, the name, ownership, and survey number, if any, of each claim to be credited, and the value of the interest credited to each should be stated.

10-54. When a lode and millsite are included in the same survey, an expenditure of \$500 at the time of application for patent is required upon the lode claim only.

10-55. When a survey embraces several locations held in common, constituting one entire claim whether lode or placer, an expenditure of \$500 at the time of application for patent for each location embraced in the group is required.

10-56. It is held in *James Carreto*, 35 L.D. 361 (1907), (syllabus), that —

Where several contiguous mining claims are held in common and expenditures are made upon an improvement intended to aid in the common development of all of the claims so held, and which is of such character as to redound to the benefit of all, such improvement is properly called a common improvement.

Each of a group of contiguous mining claims held in common and developed by a common improvement has an equal, undivided interest in such improvement, which is to be determined by a calculation based upon the number of claims in the group and the value of the common improvement.

There is no authority in law for an unequal assignment of credits out of the cost of an improvement made for the common benefit of a number of mining claims, or the apportionment of a physical segment of an improvement of that character to any particular claim or claims of the number, such an arbitrary adjustment of credits as the exigencies of the case may seem to require being utterly at variance with the

essential idea inherent in the term "a common improvement."

In any patent proceedings where a part of a group of mining claims is applied for and reliance is had upon a common improvement, the land department should be fully advised as to the total number of claims embraced in the group, as to their ownership, and as to their relative situations, properly delineated upon an authenticated map or diagram. Such information should always be furnished in connection with the first proceeding involving an application of credit from the common improvement, and should be referred to and properly supplemented in each subsequent patent application in which a like credit is sought to be applied.

10-57. It is also held in *Aldebran Mining Co.*, 36 L.D. 551 (1908), (syllabus), that —

A common improvement or system, offered for patent purposes, although of sufficient aggregate value and of the prerequisite benefit to all the mining claims of a group, can not be accepted as it then stands in full satisfaction of the statutory requirement as to such of the claims the location of which it preceded, the law requiring that an expenditure of at least \$500 shall succeed the location of every claim.

If the requisite benefit to the group is shown, or to the extent of such of the claims as are so benefited, and the elements of contiguity and common interest in the claims concerned appear; if the improvement represents a total value sufficient for patent purposes for the number of claims so involved; if for each claim located after the partial construction of the improvement the latter has been subsequently extended so as to represent an added value of not less than \$500, each is entitled under the law to a share of the value of the common improvement in its entirety, no claim receiving more or less than another from that source, participating therein without distinction or difference, and as to each the statutory requirement is satisfied.

10-58. The explanatory statement in such cases should be given in the field notes or affidavit at the conclusion of the description of the improvements included in the estimate of expenditure, and should be as full and explicit as the facts in the case warrant, dealing only with improvements, conditions, and circumstances as they actually existed at the time of survey or subsequent field examination.

10-59. If the value of the labor and improvements upon a mineral claim is less than \$500 at the time of survey, authority is given to file thereafter supplemental proof showing \$500 expenditure made prior to the expiration of the period of publication. The information on which to base this proof must be derived by the mineral surveyor, who makes the actual sur-

vey, from a careful examination upon the premises.

10-60. Only improvements made by the claimant or his grantors subsequent to the location of the claim are available under the statutes for patent expenditure. The survey office certifies to this fact according to the record, and, as the certificate is based on the report of the mineral surveyor, the latter should exercise special care to see that such improvements only are reported.

AMENDED SURVEYS

10-61. Amended surveys are ordered in the same manner as original mineral surveys. The conditions and circumstances peculiar to each separate case and the object sought by the required amendment are set forth in the office authorization, and alone govern all special matters relative to the manner of making such surveys and the form and subject matter to be embraced in the field notes.

10-62. An amended survey must be made in strict conformity with, or be embraced within, the lines of the original survey. If any portion of the amended and original surveys are identical, that fact must be distinctly stated in the field notes. If not identical, the bearing and distance are given from each established corner of the amended survey to the corresponding corner of the original survey. The lines of the original survey, as found upon the ground, are laid down upon the preliminary plat in such manner as to contrast and show their relation to the lines of the amended survey.

10-63. The field notes of the amended survey are prepared on the same size and form of blanks as are required for the field notes of the original survey, and the abbreviation "Am." will be used after the survey number wherever it occurs.

PLATS

10-64. Chapter IX covers the essentials of plat making. In addition, the following instructions relating especially to mineral plats should be observed. The returns of the survey when filed in the public survey office are carefully examined and compared with the records to determine that all conflicts with prior approved surveys are correctly shown, that all connecting lines given are in harmony with the record, that all material errors found in prior surveys are fully reported, and that the calculations of intersections and of conflicting areas are correct. The final plat is drawn on a scale of 200 feet to an inch when practicable. See Specimen Mineral Plat, insert No. 2.

The scale should be large enough to illustrate clearly the improvements, conflicts, and physical features described in the field notes, together with all courses and distances of intersecting lines and connecting lines, where space permits. Any topographic features described in the field notes tending to confuse or obscure the plat may be omitted, but as the copy of the plat posted on the claim is a notice to the public of the ground applied for, all of the roads, streams, and other objects that may aid in locating the surveyed ground should be shown.

In case the entire survey cannot be shown on one sheet on a scale large enough to be clear, two or more sheets may be used and numbered consecutively, each sheet bearing the inscription "Survey No.____, Sheet No.____ of ____ Sheets." The last sheet should carry the certificate of approval, with the extra sheets of the same width and not longer than the last sheet.

10-65. The mineral survey is approved in the survey office. When approved, the plat is reproduced and the returns of the survey are distributed in accordance with existing regulations.