PUBLICATION 8056 FWQP REFERENCE SHEET 7.3

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Farm Water Quality Planning

A Water Quality and Technical Assistance Program for California Agriculture

This Reference Sheet is part of the **Farm Water Quality Planning (FWQP)** series, developed for a short course that provides training for growers of irrigated crops who are interested in implementing water quality protection practices. The short course teaches the basic concepts of watersheds, nonpoint source pollution (NPS), self-assessment techniques, and evaluation techniques. Management goals and practices are presented for a variety of cropping systems.

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Reference:

Legal Descriptions of Property

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In all U.S. states created out of the territory northwest of the Ohio River, states south and west of Georgia, and all states but Texas west of the Mississippi River, the U.S. System of Rectangular Surveys was used exclusively, or nearly so. Even in these states, however, surveyors resorted to metes-and-bounds descriptions in describing tracts of land for which title was obtained prior to their official survey by the U.S. government.

U.S. SYSTEM OF RECTANGULAR SURVEYS

The Public Lands Survey is carried out under direction of the Bureau of Land Management, formerly the General Land Office. Details on the U.S. System of Rectangular Surveys can be found in the *Manual of Instructions for the Survey of the Public Lands of the United States* (Washington, DC; U.S. Government Printing Office, 1947). This system, also referred to as the Survey of the Public Domain or the Congressional Survey System, is based on the Land Ordinance of 1785. After having been modified in 1787 and again in 1796, this became the official land survey system for the public domain: those lands to which the federal government gained title through cession, purchase, and conquest before they were allotted to private individuals. The original public domain consisted of the westerly lands east of the Mississippi River that were relinquished by the original 13 states between 1781 and 1802. Subsequent additions made to the public domain between 1803 and 1867 make up nearly all of the present land areas of the United States west of the Mississippi River, excluding Texas.

The U.S. System of Rectangular Survey is based on arbitrarily selected pairs of east-west and north-south lines intersecting at an initial point (also referred to as the *point of origin*). The north-south line passing through the initial point is referred to as the *principal meridian,* and the perpendicularly intersecting east-west line is referred to as the *base line.* Both lines are run on true cardinal directions. The survey of the public domain has utilized 15 initial points and accompanying intersecting lines east of the Mississippi River, 19 points west of the Mississippi River and 3 points in Alaska. Figure 1 shows the survey area controlled by each principal meridian and base line.

Figure 1 also shows the subsequent division of each survey area into rectangular land tracts. This process follows distinct sequential steps. First, the four quadrants formed by the principal meridian and base line are divided into *blocks* 24 miles square (Figure 1 shows one block in each quadrant). Second, each 24-mile-square block is divided into sixteen 6-mile-square *townships* (grid shown in Figure 1). The secondary north-south lines delineating the townships are known as *range lines.* Third, each township is divided by north-south and east-west section lines into 36 1-mile-square *sections* of approximately 640 acres each (Figure 2). Fourth, each section is divided into half-mile square *quarter sections* of approximately 160 acres each. Further subdivision may occur after the land is transferred into private ownership (Figure 3).

Within this land division system, only one tract of land can have a given description. Each township is designated numerically by the number of the *tier* (row) north or south of the base line and by the number of the *range* (column) east or west of the principal meridian. The sections within each township since 1796 have been numbered 1 through 36, beginning with the northeast corner as shown in Figure 2. Figure 3 is a section diagram of section 14 from the township shown in Figure 2. Assuming that Figures 1, 2, and 3 are in the Salt Lake Principal Meridian survey area, the complete legal description of the tract of land lying in the lower right-hand corner of Figure 3 is East Half of Southeast Quarter of Section 14, Township 2 South, Range 3 West of the Salt Lake Principal Meridian (abbreviated to E½ SE¼, Sec.14, T2S R3W, Salt Lake P.M.).

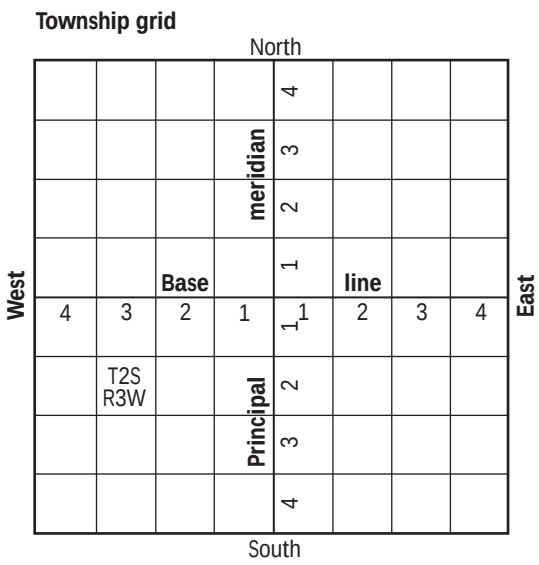

Figure 1. Township grid: four 24-mile-square blocks of sixteen 6-mile-square townships each, at the intersection of the principal meridian and base line of a survey area.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	Section 14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Figure 2. Township 2 south, range 3 west from Figure 1, divided into 36 1-mile-square sections.

Section 14

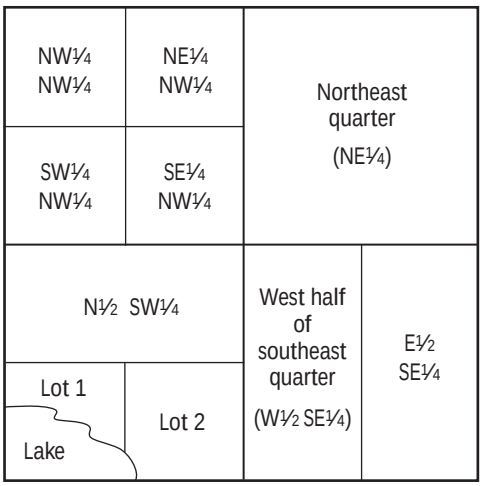

Figure 3. Section 14 from Figure 2, divided into quarter sections and then further subdivided.

Range lines and township lines are, respectively, true meridians and true parallels. In theory the sides and base (east, west, and south boundaries) of each township will be full distance. Section lines, on the other hand, are surveyed parallel to the eastern and southern boundaries of the township. This results in putting the deficiencies or excess area in sections along the northern and western edges of the townships. These area discrepancies are allowed for by establishing irregular size lots along the outward edges of the affected sections. These lots, as well as those resulting from irregularities caused by such things as lake boundaries and survey area boundaries, are numbered within the section in a counter-clockwise direction (see lower left corner of Figure 3).

REFERENCE

George, M. R. n.d. Rangeland watershed program water quality planning guide no. 2: Legal descriptions of property. Davis: Department of Agronomy and Range Science, University of California.

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Publication 8056

pr-10/02-WJC/CR ISBN 978-1-60107-234-4

UC PEER REVIEWED

This publication has been anonymously peer reviewed for technical accuracy by University of California scientists and other qualified professionals. This review process was managed by the ANR Associate Editor for Natural Resources.