BUREAU OF LAND MANAGEMENT

# Fractional Sections

With John Farnsworth and Belle Craig

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CADASTRAL SURVEY

# Fractional Sections

There are two types of fractional sections referenced in the 1973 Manual. This has caused confusion as to when to apply special rules for subdivision of sections. Here are John Farnsworth and Belle Craig to discuss this subject.

*>> J. Farnsworth:*
Belle and I are going to discuss fractional sections as outlined in Chapter 3 of this Manual under the system of Rectangular surveys. Now the sections that are fractional in the 73 Manual were called fractional by area, which has created a lot of confusion in the survey community.

Fractional by area sections have areas other than 640 acres and they were found mainly on the north and west boundaries of townships where lots were created against those boundaries. Now because they were called fractional it caused confusion in the method utilized to subdivide those sections. Because these sections have all four quarter corners, they are subdivided by the standard intersection method, as outlined in the Manual.

One thing you have to remember, that in this Manual, east and west centerlines are lines of constant bearing. You need to look at Chapter 2 in the Manual for the discussion of lines of constant bearing. First, let's look at a slide of a section that is fractional but is still subdivided in normal method. In this example, there is water, or lake, or river is going east and west across the section but all four quarter corners are established. This is the section that is fractional only by the fact that it is invaded by water but it is still subdivided in a normal method.

*>>B. Craig:*
So John, one of the things that this new Manual is going to do, this edition of the Manual rather, is to sort of clarify treatment of fractional sections. One of the ways it does that is that it completely omits that fractional by area definition that you just talked about. In this edition of the Manual, another good thing is that it always talks about fractional sections with regard of how to properly subdivide the section. We have got a couple of different sections in this Manual.

One is entitled Subdivision of Fractional Sections by Survey and the second is entitled Subdivision of Fractional Quarter Sections by Survey. So, one of the things we want to look at before we get started and one of the most important things to do is first determine whether or not a section is fractional to decide how to go about the process of subdividing the section. This is defined in two different ways in this Manual. The first way, is if a section contains outline areas of protraction is surveyed.

Well, I am not going to really address that because that is more internal guidance for BLM surveys. An example to that might be a completion survey. The second and most important definition of a fractional section is the section that has been invaded in which at least one or more of the quarter corners cannot be fixed by the survey. By rule, the procedure for subdivision for this type of fractional section is to be nearly as possible and conformity with the official survey. Now let us go ahead and take a look at a couple of these examples.

*>> J. Farnsworth:*
Well Belle, if you look at the example on the left of the section four, this is a section that is fractional is against a reservation or grant. As you can see in this example there is an Indian Reservation boundary that cuts through the section and you do not have a north quarter corner, you do not have a northeast corner section and thus, this is a fractional section that requires a special survey method.

*>>B. Craig:*
Now, the second example is a fractional section against a meandered body of water. You can see that water has invaded this section. It is fractional because there is more than one quarter corner missing, there are section corners missing, and again this example shows an example of a fractional section.

*>> J. Farnsworth:*
So, this fractional section again will need a special survey method or a non-standard section method for survey.

*>>B. Craig:*
Correct.

*>> J. Farnsworth:*
So now these fractional survey sections, they do not have a full complement of quarter corners due to the invasion of water or other similar featured in the section. This Manual will tell us very specifically how to subdivide these sections. So Belle, let us talk about some of the figures that are going to be in the new Manual.

*>>B. Craig:*
In this example, you can see a survey where on the north boundary the entire north boundary has not been surveyed. It has been invaded by a lake. In this instance, you can see that the north quarter corner has not been fixed. So you have to have a special method to subdivide this section.

*>> J. Farnsworth:*
Not only has the north corner not been set, but there has been no connection between the meander corners on the lake. There is no mathematical relationship. To subdivide the section you should not be making up the un-surveyed parts and trying to do a mid-point or some sort of proportional solution. There is no quarter corner that has ever been established or accepted by the Chief Cadastral Surveyor for BLM. That makes this a fractional section for purposes of survey.

*>>B. Craig:*
So let us go ahead and look at the next example. In this example, it is a little bit different than the other one we saw. We see that it appears that the east boundary of that section has actually been surveyed. You can see that the draftsmen probably took a little bit of cartographic license. He has gone ahead and he has returned measurements from the meander corner to the South, to a position on the quarter corner. He has actually drawn the section corner in on the water and of course there is a meander corner in the North.

John this is an example of how to do a weighted mean bearing calculation. It is Figure 3-46 in this edition of the Manual. And I encourage people to go to this figure and look at how to do this calculation.

*>> J. Farnsworth:*
That sounds good. Why do not we go ahead and look at some examples of fractional sections and we will discuss what you might do for determination of fractionality and then the subdivision procedures. We got a section 22 here Belle that looks like it is invaded by the Pacific Ocean on the west.

*>>B. Craig:*
Yes this is definitely a fractional section but you can see some of the lines have been run. We have got a north quarter corner, a south quarter corner, and an east quarter corner. So the portion of the north boundary has been run and a portion of the south boundary is run. How do you think we ought to subdivide it?

*>> J. Farnsworth:*
Well looking at this slide still we want to go back and look at the fact that because there is a north and south quarter corner, we can connect those quarter corners by survey in the normal manner. The north-south centerline would be exactly what you do in any normal section subdivision. It is the east-west centerline where you got something different going on. You have a partial north boundary and a partial south boundary. For this section, the east-west centerline would be run on a weighted mean bearing of those boundaries and you would establish the center quarter at the intersection of those lines.



*>>B. Craig:*
Let us go ahead and look at our next example. This example is also an example of a fractional section again invaded by the Pacific Ocean. In this case, most of this section is missing. We have a north quarter corner and an east quarter corner. The way to properly subdivide this section would be to establish the east-west centerline parallel to the north boundary and the north-south centerline parallel to the east boundary.

*>> J. Farnsworth:*
Belle that is very close to being conformity with the Act of 1805 and how the

Manual explains the parallelism in running parallel lines when you have no opposing boundary.

*>>B. Craig:*
That's right.

*>> J. Farnsworth:*
So this is a really good example of that. I think that now we should go ahead and summarize what we have talked about today. When you look at the fractional section parts of this Manual, you ought to look, read and review those sections carefully. You need to look at protecting the plat of survey by carefully examining the plat. Look to see if the section is fractional by being invaded by water or some other special survey and then consult the appropriate section of the Manual for the subdivision of fractional sections.

*>>B. Craig:*
I think another important thing that we need to do John is you need to go ahead if possible look at taking the CFedS training for additional training on this subject matter. They have an excellent section on a discussion of fractional sections. The other thing to always bear in mind is that you can consult with BLM's cadastral state offices if needed when you are dealing with complex surveys.

*>> J. Farnsworth:*
I think BLM state offices are always willing and they are there to help give you some consultation on survey problems that you think may need some special methodology.

*>>B. Craig:*
So I think that pretty much wraps it up for our discussion on fractional sections.