



**FIGURE e4.5.11** The branch instruction requires a single state. The first three outputs that are asserted cause the ALU to compare the registers (ALUSrcA, ALUSrcB, and ALUOp), while the signals PCSource and PCWriteCond perform the conditional write if the branch condition is true. Notice that we do not use the value written into ALUOut; instead, we use only the Zero output of the ALU. The branch target address is read from ALUOut, where it was saved at the end of state 1.