**APPENDIX 4**

**Appendix 4.** OxCal code used to establish the Bayesian-modelled chronology for the boundaries for the Manteño phase in the archaeological sites surrounding Ligüiqui (compiled data in Appendix 2). This is an example for La Libertad site. The code for the other Manteño sites is similar but does not include the local marine calibration because the radiocarbon dates come from terrestrial sources.

// Delta\_R values updated for Marine20

 Options()

 {

 SD1=FALSE;

 SD2=TRUE;

 SD3=FALSE;

 };

 Plot()

 {

 Outlier\_Model("General",T(5),U(0,4),"t");

 Outlier\_Model("Charcoal",Exp(1,-10,0),U(0,3),"t");

 Curve("Marine20","marine20.14c");

 Delta\_R("LocalMarine",11,55);

 Curve("SHCal20","shcal20.14c");

 Sequence("Libertad")

 {

 Boundary("Start Phase");

 Phase(“Manteño”)

 {

 Curve("=SHCal20");

 R\_Date("L-1232X", 550, 100)

 {

 Outlier("Charcoal", 1);

 };

 R\_Date("L-1232Z", 600, 100)

 {

 Outlier("Charcoal", 1);

 };

 Curve("=LocalMarine");

 R\_Date("L-1232W", 950, 80)

 {

 Outlier("General", 0.05);

 };

 R\_Date("L-1042H", 1200, 100)

 {

 Outlier("General", 0.05);

 };

 R\_Date("L-1232T", 1750, 100)

 {

 Outlier("General", 0.05);

 };

 };

 Boundary("End");

 };

 };