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THE CHIPPED STONE TOOL INDUSTRIES OF BLACKMAN EDDY, BELIZE

by

Matthew Patrick Yacubic

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Arts

Department of Anthropology

Brigham Young University

February 2006

ABSTRACT

THE CHIPPED STONE TOOL INDUSTRIES OF BLACKMAN EDDY, BELIZE

Matthew P. Yacubic

Department of Anthropology

Masters of Arts

One of the most significant finds at the site of Blackman Eddy, Belize, is a series of superimposed structures that date between 1200 B.C.-A.D. 600 (calibrated). Because it was continuously occupied for over 1800 years, this site provides a unique opportunity to examine long-term socio-economic changes in the eastern Maya lowlands. This thesis is a diachronic study of the chipped stone tool artifacts of Blackman Eddy using technological, attribute, and use-wear analysis. The data collected for this study were examined to see what types of raw materials were used in tool production, what types of tools were produced, how they were produced, and what they were used for during the Middle Preclassic, Late Preclassic, and Classic periods. Each of the attributes studied in this thesis creates different opportunities and constraints for the various chipped stone tool industries of Blackman Eddy, and changes in chipped stone artifact attributes between the different structures may be indicative of socio-economic change over time.

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BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a thesis submitted by

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This thesis has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

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Acknowledgements

I would like to thank everyone who has helped me along in this thesis. Specifically, I would like to thank James Garber and Katherine Brown for giving me the opportunity to do this study. A tremendous amount effort by all of the staff and crew that have worked at Blackman Eddy during the 2000-2003 field could not go unrecognized as well as the contributions made by Ronald Lowe and Fred Nelson from the New World Archaeological Foundation. Their expertise, encouragement, and advice during the survey work and initial analysis of the artifact collection from Blackman Eddy was very gracious and helpful. I would also like to thank the members of my thesis committee for their advice. I would like to specifically thank John Clark for his extreme patience and dedicated help in all aspects of this thesis. Finally, I would like to thank my wife Ana for helping me with the graphics as well as her strong support and encouragement.

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Preface

The analysis of stone tools arose simultaneously with the development of scientific archaeology during the later part of the nineteenth century (Trigger 1989:81-86). Stone tools have two important characteristics that set them apart from other artifacts. First, they preserve well in the archaeological record. This means that stone tools will be found in archaeological sites from a wide variety of different temporal, social, and geographical settings. With the rise of the New Archaeology during the 1960s, a focus on the processes of culture and cultural development led archaeologists to the second important characteristic of stone tools; stone tools can be used to infer human behavior patterns (Sheets 1972:372). These behaviors reflect the economic activities of individuals within a particular social setting.

Because this thesis examines the connections between society, economics, production, and exchange, it relates to a sub-field of anthropology known as economic anthropology. Economic anthropology is the study of economic institutions and behaviors in anthropological settings using an ethnographic style (Plattner 1989:2). Economic anthropology differs from more traditional economic studies in its high sensitivity to context, the wider setting and local history of the particular group or behavior under study. This holistic approach to studying economic activities provides an important perspective for economic anthropology, a perspective that explains economic activity relative to the social or political restraints of the social system (Polanyi 1954; Sahlins 1972; Earle 2001). This means that all economic activities are subject to pressures of the society to which they pertain. Thus, changes in economic activities are reflections of changes in society and vice versa (Clark 1987:259).

The purpose of my thesis is to look at social change at the site of Blackman Eddy and the economic impacts of social change based on an analysis of the chipped stone artifacts and architectural data. Social change at Blackman Eddy is inferred from shifts in the architectural patterns and function of Structure B1 (Brown 2003). Under this assumption, rises in social complexity are linked to public architecture and the roles that these buildings played in society (Brown 2003:1). For Blackman Eddy, three important shifts in social relations occurred during the site's occupation based on architectural changes and building function. This model of social change will be tested in this study using the chipped stone tool data collected from Structure B1. The hypothesis of this thesis is that social change at Blackman Eddy (as indicated by changes in the architectural characteristics and functions of the various buildings associated with Str. B1) caused changes in the chipped stone tool industries (as reflected by the changes in the chipped stone artifact attributes). The null hypothesis to be tested in this thesis is that social change at Blackman Eddy did not cause significant changes in the chipped stone tool industries of Blackman Eddy.

The first chapter provides an overview of the geography and geology around Blackman Eddy, gives a description of its architecture, and analyzes changes in the labor costs and architectural styles of the various buildings of Str. B1. The second chapter discusses the methods used to analyze the chipped stone tool industries of Blackman Eddy. Chapter 3 looks at the data collected from the artifacts associated with the seven construction episodes of Str. B1. The goal of this chapter is to look for any changes in different attributes analyzed in this study. The fourth chapter looks at the chipped stone tool industries of five sites in Belize: Colha, Cuello, Cerros, Barton Ramie, and Cahal

Pech and compares the data on the chipped stone tool industries of the five site's to the data from Blackman Eddy.

Chapter 1- Blackman Eddy and its Architectural History

Geography

The site of Blackman Eddy is located in the eastern Maya lowlands in the modern state of Belize. The Maya lowlands are archaeologically defined “by the limits of elite-oriented cultural traits of Classic Maya civilization—particularly the combination of corbel vaulting, hieroglyphic inscriptions, carved and dated monuments and specific kinds of polychrome pottery” (Hammond and Ashmore 1981:20). Geographically, most of the sites that exhibit these traits are found in the tropics of Central America in an area that extends from 15 to 22 degrees north and 87 and 93 degrees west (Hammond and Ashmore 1981:20). “In modern political terms, the area falls within southeastern Mexico (states of Yucatan, Quintana Roo, Campeche, Chiapas, and Tabasco), Belize, and Guatemala, extending on the east just over the border of Honduras” (Hammond and Ashmore 1981:20).

Hammond describes three geographic zones for Belize: the Eastern Pasion Zone in southern Belize, the Eastern Central Zone in the northwest, and the Belize zone in the northeast (Hammond 1981a:157) (Figure 1). The Belize River Valley is located in the Eastern Central Zone (Figure 2). This environment is described as “one of perennial sluggish rivers flowing in fairly narrow, clear defined valleys with several series of relict alluvial terraces. These valleys are incised into the undulating-to-rolling limestone landscape, which has occasional steep scarps along the rivers resulting from the erosion of asymmetrical synclines” (Hammond 1981a:163). The Belize River Valley itself is geographically defined by the Maya Mountains that boarder it to the south and west. The

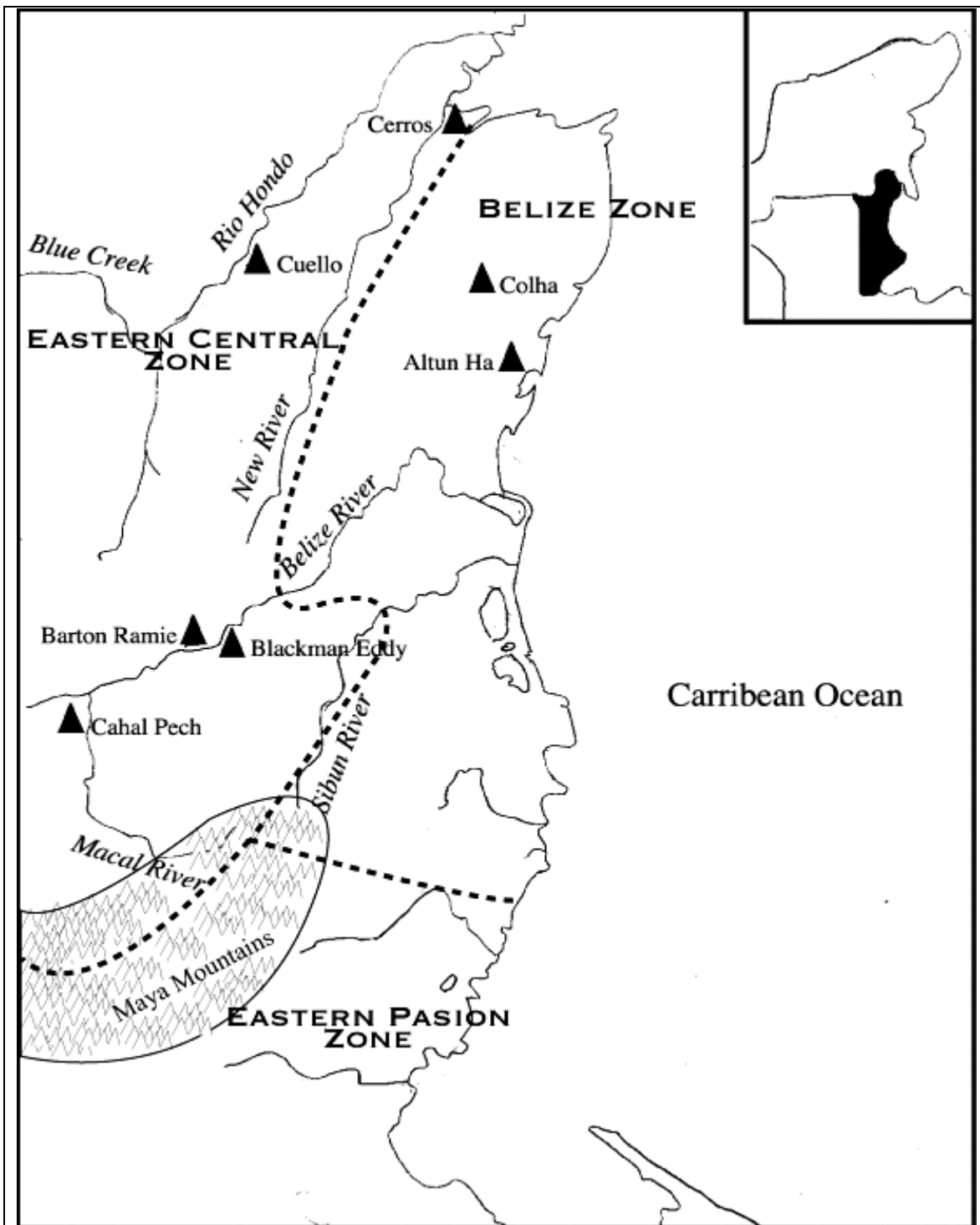


Figure 1. Geographic Zones of Belize

outcrops along the terraces in the foothills and upland areas (Ford and Olsen 1989:194). These chert outcrops were extensively used by the prehistoric inhabitants of the Belize River Valley as sources for stone tools. Archaeological work performed under the Belize River Archaeological Settlement Survey (BRASS) found three chert quarries that date to the Classic period in the Belize River valley near the sites of Yaxox, El Pilar, and Alta Vista (Ford and Olsen 1989:189). These surveys also found debris associated with the manufacture of chert chipped stone tools.

Zone 2 consists of the Maya Mountains, which are a series of uplifted Toledo period deposits of granite, quartz, and quartzite (Owner 1928:502). The Belize River Valley is close enough to Zone 2 to have access to significant quantities of these raw materials (Owner 1928:508). Several veins of quartz have also been observed in the Belize River Valley southeast of San Ignacio along the edge of the Little Mountain Pine Ridge (Owner 1928:501). Obsidian is the only raw material type found in the archaeological record of Blackman Eddy that does not naturally occur in the region's environment. This is significant because any obsidian tools found at Blackman Eddy had to be imported from outside of the region. The geologic resources found in Belize had an important impact on the manufacture of chipped stone tools at Blackman Eddy throughout its history because chert, quartz, and quartzite were used extensively in the manufacture of chipped stone tools from the beginning of Blackman Eddy's occupation until its end.

The Site of Blackman Eddy

Blackman Eddy is located in the Belize River Valley about 20 km north of San Ignacio. The central core of the site rests at the top of a finger ridge overlooking the Belize River Valley and measures 200 m north-south by 95 m east-west (Hartman et al. 2001:37). Excavations at Blackman Eddy have uncovered an occupational history that lasts over 1800 years (Hartman et al. 1999:4; Table 1). The people of Blackman Eddy constructed a variety of different structures, many of which have multiple building sequences (Figure 3). Two plazas (Plazas A and B) are enclosed by several medium-sized structures to form the site core of Blackman Eddy. Plaza A is the larger of the two and has a quadrangle patio group, range structures, temple pyramids, a ball court, and several carved stelae (Hartman et al. 2002:5). Excavations in Plaza A indicate that all of its structures and features date to the Classic and Postclassic periods.

Plaza B is similar in design to Plaza A, but is older, with the two of the main structures (Structure B1 and Structure B2) dating to the Preclassic period. Structure B1 (Str. B1) is located in the north end of Plaza B and is the oldest and largest structure in the plaza. In recent history, Str. B1 has gone through drastic changes. Str. B1 was heavily damaged and destabilized by illegal bulldozer activity during the 1980s (Hartman et al. 2002:5). Furthermore, continued erosion and slumping after the bulldozer cut destabilized the remaining portions of the structure. This destabilization led the Belizean government to make a decision in 1994 to level Str. B1 as an archeological undertaking. Though the bulldozing activity created significant archaeological loss, it did give rise to a unique opportunity for archaeologists to conduct horizontal excavations on the structure. These excavations revealed that Structure B1 is actually a series of superimposed buildings,

Calendar Date	Period	Ceramic Sequence			Blackman Eddy	Construction Episode
		Uaxactun	Barton Ramie/ Cuello	Blackman Eddy	Buildings	
A.D. 1400	Late Post Classic		New Town			
1200						
1000	Early Post Classic					
800						
600	Late Classic	Tepeu 3 Tepeu 2 Tepeu 1	Tiger Run	Tiger Run	Str. B1.1	
400	Early Classic	Tzacol	Hermatage	Hermatage	Str. B1.2.A	Episode 7
200	Late Preclassic	Chicanel	Floral Park	Mount Hope	Str. B1.2.B	
0			Mount Hope			
B.C. 200			Barton Creek	Barton Creek	Str. B1.3.A Str. B1.3.B Str. B1.3.C Str. B1.3.D	Episode 6
400	Mamom	Jenney Creek	Late Facet Jenney Creek			
600			Str. B1.3.E Str. B1.3.F			
800	Middle Preclassic			Early Facet Jenney Creek		
				Swasey	Kanocha	
Str. B1.7	Episode 2					
Str. B1.8	Episode 1					
Str. B1.9						
Str. B1.10						
1000				Str. B1.11		
1200				Str. B1.12 Str. B1.13		

Table 1. Ceramic Sequences and Building Dates of Blackman Eddy.

with the earliest buildings dating to the early part of the Middle Preclassic period (Hartman et al. 2002:6).

In my analysis, I grouped artifacts from these buildings into seven construction episodes to provide me with a larger sample of chipped stone tools for analysis. The division of buildings into the seven construction episodes was based on common temporal dates and architectural characteristics. While it was possible to organize chipped stone artifacts into the three phases (Domestic, Public/Integrative, and Monumental Phases), this action did not significantly increase the number of obsidian, quartz, or quartzite artifacts beyond the division into seven construction episodes. However, this division was useful for comparing the chipped stone data from Blackman Eddy with the chipped stone data from other sites in the eastern lowlands (Chapter 4). The criteria used to classify structures into construction episodes were similarities in pottery from fill and deposits, architectural forms, and radiocarbon dates where available (Table 2). The seven construction episodes created for this study include all of the Preclassic and Classic period structures found during the excavations of Structure B1. The final construction episode, which dates to the Late Classic period, is not considered in this study. The seven construction episodes of Str. B1 are presented next, from earliest to latest.

Location	Phase	Beta #	Radio-carbon age BP	Radio-carbon age BC	Calibrated 1 sigma B.C	Calibrated 2 Sigma B.C.
BR-F3	Kanocha	122281	2990+/-60	1040+/-60	1295-1120	1395-1015
BR-F5b	Kanocha	162573	2800+/-40	850+/-40	1000-900	1030-840
BR-F5a	Kanocha	122282	2750+/-40	800+/-40	920-830	990-820
Bedrock	Kanocha	122282	2730+/-50	780+/-50	910-820	980-805
BR-F2	Early Jenney Creek	162571	2420+/-40	470+/-40	740-710 and 530-410	760-620 and 590-400
B4-F1	Early Jenney Creek	162570	2460+/-40	510+/-40	760-620 and 560-420	780-410
BR-F4	Early Jenney Creek	159144	2450+/-40	500+/-40	760-640 and 560-420	780-400
B1-7th	Early Jenney Creek	162572	2340+/-60	390+/-60	410-380	740-710, 530-360, and 290-230
B1-6th	Early Jenney Creek	159146	2430+/-40	480+/-40	750-700 and 540-410	770-400
B1-5th	Early Jenney Creek	122279	2500+/-50	550+/-50	780-515	795-410
B1-5th	Early Jenney Creek	103956	2440+/-60	490+/-60	760-635 and 560-405	785-390
B1-4th	Early Jenney Creek	103959	2480+/-50	530+/-50	775-485 and 465-425	790-405
B1-3rd	Late Jenney Creek	159141	2290+/-40	340+/-40	390-370	400-350 and 300-220
B1-3rd	Late Jenney Creek	159145	2240+/-40	290+/-40	380-350 and 310-210	390-190
B1-3rd	Late Jenney Creek	159147	2190+/-40	240+/-40	360-280 nad 240-190	380-160

Table 2. Radiocarbon Dates From Blackman Eddy, After Brown 2003

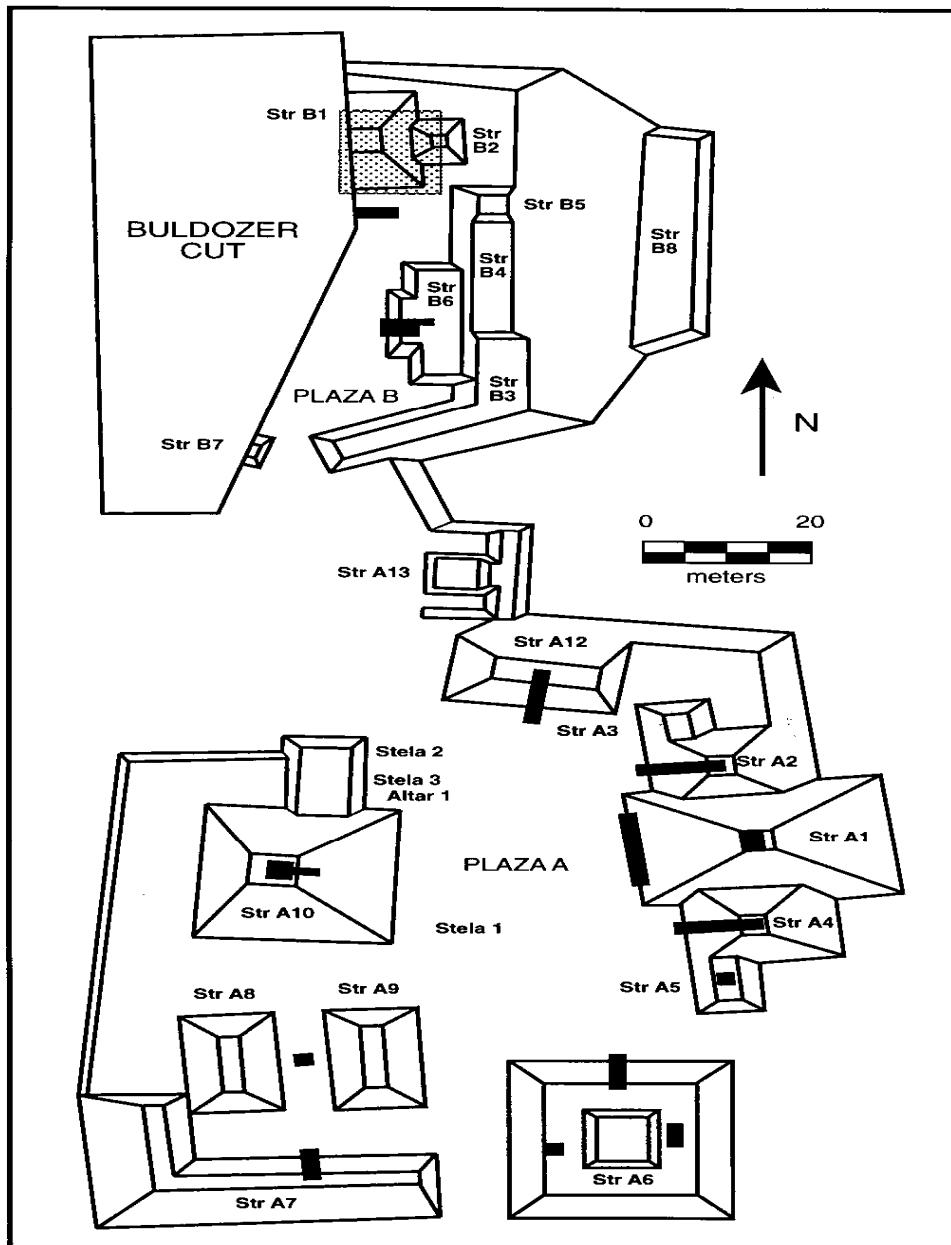


Figure 3. Plan View of Blackman Eddy, after Hartman et al. (2001).

Construction Episode 1

The first construction episode for Str. B1 (Episode 1) consists of Str. B1.13, Str. B1.12, Str. B1.11, and Str. B1.10 (Figure 4). These structures date to the Middle Preclassic period. Carbon from wood charcoal on the bedrock floor had a radiocarbon date of 1295-1120 cal B.C. (All radiocarbon dates presented here are calibrated). Radiocarbon samples taken from two pieces of wood charcoal found in Str B1.10 date between 1295-1120 and 910-820 B.C. respectively. What remains of these structures are a series of postholes cut directly into the bedrock floor (Garber et al. 2002:44). These postholes indicate that the buildings were likely round pole-and-thatch structures. All of the postholes from Str. B1.12 and Str. B1.11 have not been exposed and the exact diameters of these buildings are not known, but enough of Str. B1.10 has been exposed for its diameter to be calculated at 6.2 m. The ten postholes associated with Str. B1.10 had an average diameter of 13.3 cm (Garber et al. 2002:44). Unfortunately, the posthole patterns for Str. B1.13, Str. B1.12, Str. B1.11, and Str. B1.10 overlap on the same bedrock floor, so it is difficult to determine which of the three buildings is the oldest.

Ceramics from this first construction episode have been identified as Kanocha complex ceramics from Blackman Eddy. There are two wares present in this complex, one utilitarian ware with calcite and quartzite temper and a second, dull-slipped ware of ash temper (Garber et al. 2002:49). Common ceramic forms of the Kanocha complex include strap-handled and lug-handled jars, flat-bottom plates with out-curving sides and wide everted rims, tecomates, and colanders. Decoration techniques include appliqué and post-slip incising. The dominate ware shows close similarity to the unslipped Jocote types of Jenney Creek and appear to be its precursor (Garber et al. 2002:49).

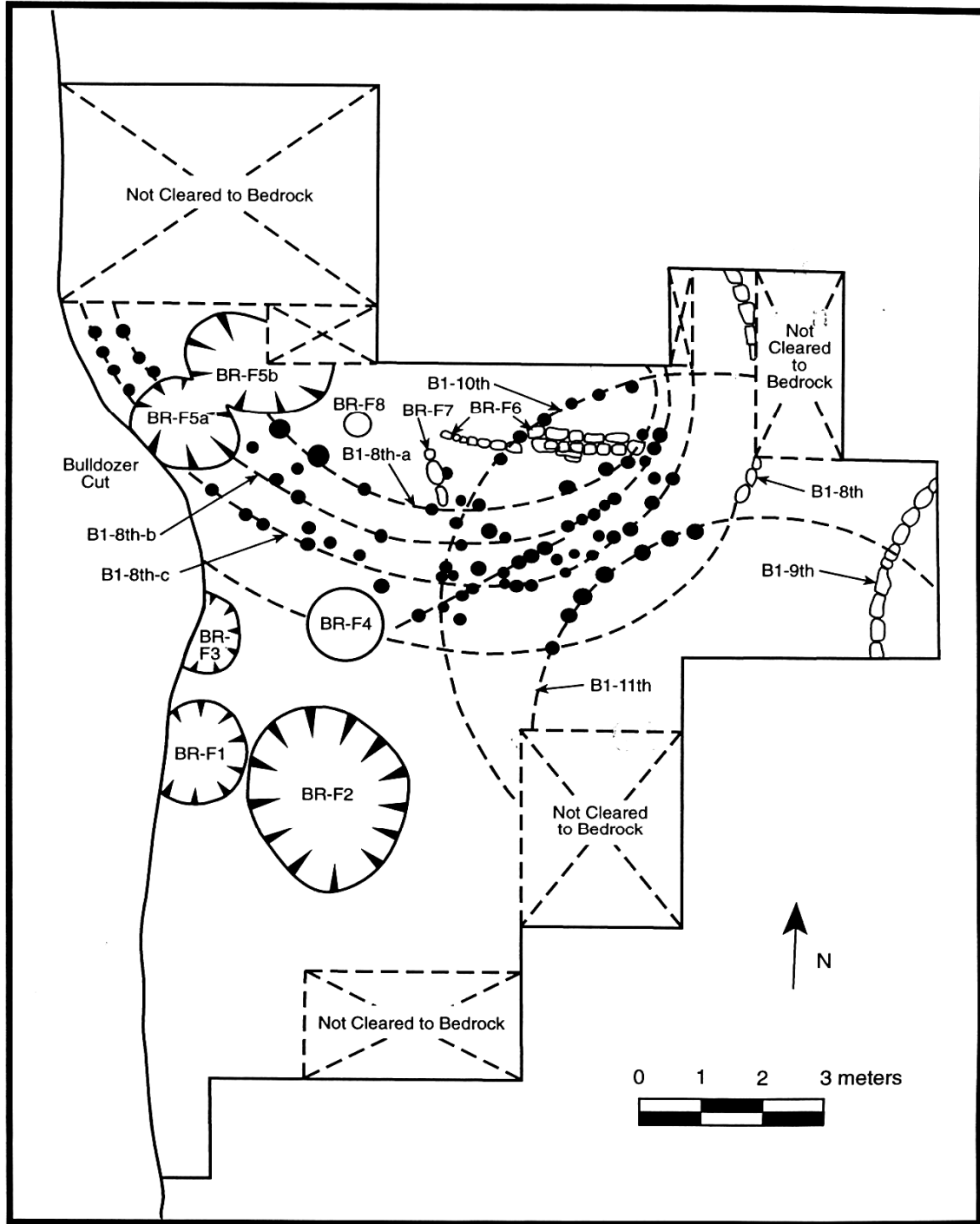


Figure 4. Plan view of bedrock features and structures at Blackman Eddy, After Hartman et al. (2002).

Construction Episode 2

The second construction episode (Episode 2) for Str. B1 consists of Str. B1.9 and B1.8. Both structures date to the early part of Middle Preclassic period (1200-850 B.C.). Both are elevated apsidal platforms between 6-8 m in diameter with heights of 45 cm. Both platforms have posthole patterns indicating that a pole structure was present on top of the platforms. Also, both structures in Construction Episode 2 appear to have increased labor costs associated with their construction. Both platforms were built of tamped earth surrounded by rough limestone blocks (Garber 2002:45). This is an increase in labor cost when compared to the previous construction episode.

Associated with construction episode 2 is a two-chambered chultun designated as Bedrock Feature 5A (BR-F5A) and Bedrock Feature 5B (BR-F5B). Each chamber measures approximately 1.5 m north-south, 2.5 m east west and 1.5 m deep. A charcoal sample from BR-F5A dates to 920-830 B.C., and a charcoal sample from BR-F5B dates between 1000-900 B.C. Ceramics found in BR-F5A and BR-F5B corroborate the radiocarbon dates. The ceramics from both chultuns were identified as Kanocha variety ceramics.

Construction Episode 3

The third construction episode of Str. B.1 consists of Str. B1.7 and B1.6. These two structures also date to the Middle Preclassic period (850-650 B.C.). Ceramics from this construction episode were identified as Cunil and Early Facet Jenney Creek ceramics similar to ceramics from Barton Ramie (Brown and Garber 2000:10). Both Str. B1.7 and Str. B1.6 are single-tiered, rectangular platforms. These two structures mark a shift in

construction style at Blackman Eddy from circular, posthole structures to elevated, rectangular structures framed with limestone blocks. Str. B1.7 is the earliest known limestone block building at Blackman Eddy, and it was also the first structure that had a limestone plaster coating on its exterior. The building measures 7.1 m north-south by 7.7 m east-west and is about 25 cm high (Brown and Garber 2000:9). The blocks used for the construction of B1.7 were trimmed with rounded edges, approximately 28 x 15 x 6 cm in size (Garber et al. 2002:45).

Str. B1.6 is the second structure of construction episode 3. Radiocarbon samples from Str. B1.6 date to 750-510 B.C. Like Str. B1.7, ceramic sherds found within Str. B1.6 were similar to Cunil and Early Facet Jenney Creek ceramics from Barton Ramie (Brown and Garber 2000:11). Str. B1.6 could be a continuation of the construction patterns first seen for Str. B1.7. This structure is a small rectangular platform that has the same basal dimensions as Str. B1.7, but has a height of 50 cm above the plaza floor (Hartman et al. 2002:9). Many of the trimmed limestone blocks are the same size and shape as those used in the construction of B1.7 and were likely removed from Str. B1.7 for the construction of B1.6 (Hartman et al. 2002:9). Also like Str. B1.7, the exterior of Str. B1.6 was coated with plaster.

Construction Episode 4

The fourth construction episode of Str. B1 at Blackman Eddy consists of Str. B1.5 (Figure 5). This building dates to the Middle Preclassic period (850-650 B.C.). Charcoal samples recovered from within the structure had radiocarbon dates of 780-515 B.C., 760-635 B.C., and 560-405 B.C. Ceramic sherds recovered from Str. B1.5 parallel ceramics

from the Early Facet Jenney Creek complex (Garber et al. 1997a:10). While Str. B1.5 may have similar radiocarbon dates as Str. B1.4, it marks a shift in architectural design when compared to its predecessor.

Str. B1.5 was two-tiered structure flanked to the east by a smaller two-tiered platform (Hartman et al. 2002:7). A western structure is presumed to have been destroyed by the bulldozer activity. The central structure was a four-stepped platform with an outset, central staircase (Garber et al. 2002:54). The exact dimensions of the central building cannot be determined because of bulldozer damage but it does have a height of 1.7 m. The upper tier was intact and measured 5.85 m north-south by 7.15 m east-west (Garber et al. 2002:54). The central structure of B1.5 had a trimmed limestone block exterior and dry-laid rubble interior. The limestone blocks were approximately 28 x 15 x 5 cm in size (Garber et al. 2002:54). Ceramics and radiocarbon dates from Str. B1.4 suggest that the building had a transitional date between the early and late Middle Preclassic periods (Brown et al. 1998:46).

The eastern building of Str. B1.5 also dates to the Middle Preclassic period based on radiocarbon and ceramic analysis (Brown et al. 1998:47). The eastern structure of B1.5 measured 7.1 m north-south by 8.63 m east-west at the base and had a height of 0.68 m. As with the central structure, the eastern structure was constructed of limestone blocks covered with a limestone plaster coating (Hartman et al. 2002:9). The alleyway created between the central and eastern platform of Structure B1.5 was the location of extensive deposits of artifact that date between the Middle and Late Preclassic periods (800- 650 B.C.).

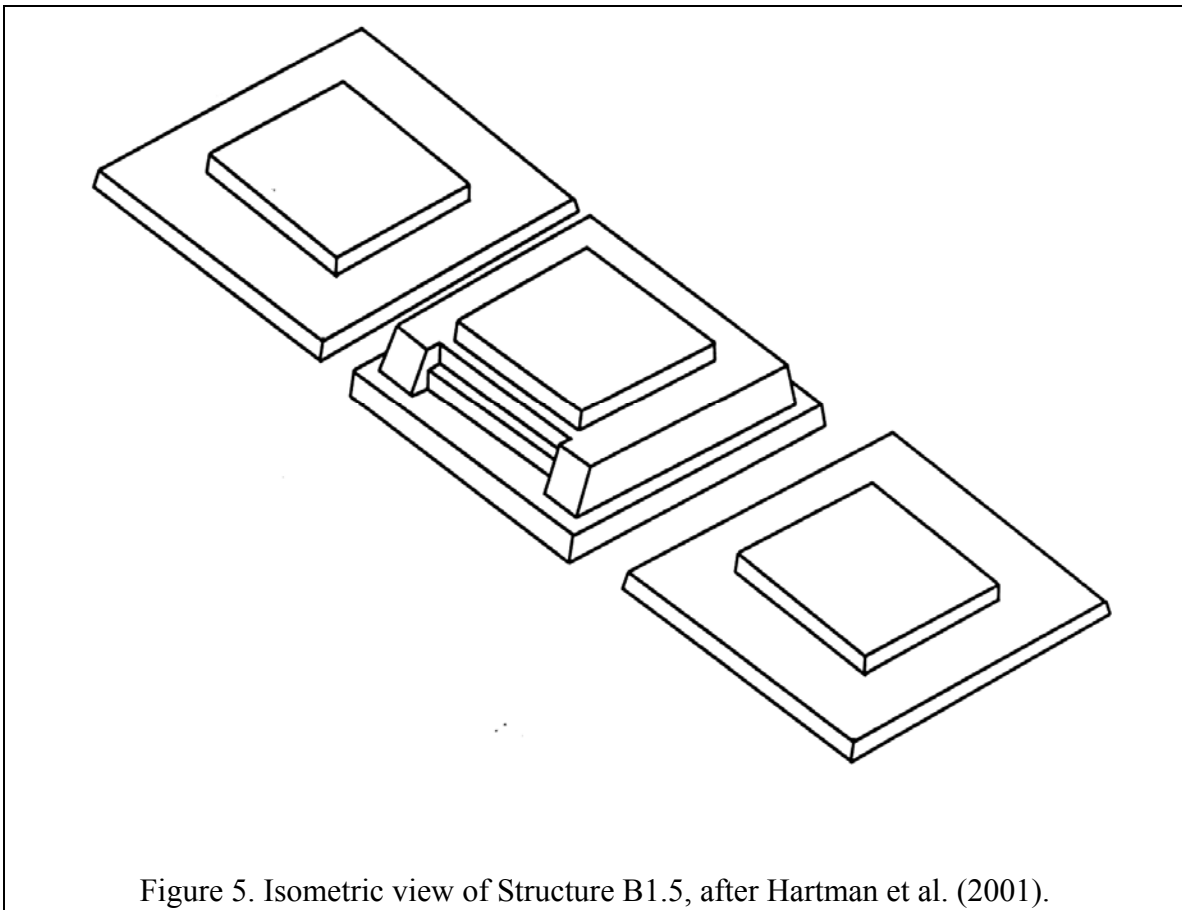


Figure 5. Isometric view of Structure B1.5, after Hartman et al. (2001).

Construction Episode 5

The fifth construction period of Str. B1 consists of Str. B1.4 and dates to the Middle Preclassic period (850-650 B.C). Two radiocarbon samples from Str. B1.4 dated between 775-485 B.C. and 465-425 B.C. Ceramics found within Str.B1.4 were similar to the early Kanuluk Phase ceramics from Cahal Pech and the Early Facet Jenney Creek ceramics from Barton Ramie (Garber et al. 2002:59). Also found within Str. B1.4 were ceramics similar to the Jocote Brown Orange and Mars Orange of Barton Ramie (Garber

et al. 2002:59). Str. B1.4 is a single-tiered platform (Figure 6). The base of Str. B1.4 measured 9.75 m north-south by 16.4 m east west, and it was 1.96 m high (Garber et al. 2002:54.).

Str. B1.4 initially began as an expansion of Str B1.5, but subsequent additions to Str. B1.4, including two new architectural features, gave it a unique look. For the first time at Blackman Eddy, stucco masks were used as architectural decoration on Str. B1.4. All that remained of these masks at the time of excavation were their nose armatures (Garber and Reilly. 1998:6). Another architectural feature used for the first time on Str. B1.4 was an inset, central staircase. This three-stepped staircase was located on the southern side of Str B1.4. Each of the steps each measured between 30-40 cm high (Garber et al. 1992:10). The summit of Str. B1.4 supported a perishable structure. Four post holes were found cut into the summit of B1.4. These post holes were conical in cross-section and had a mean diameter of 30.75 cm (Garber et al. 1996:14). However, the actual dimensions of the perishable top structure of Str. B1.4 are not known.

Construction Episode 6

The sixth construction episode for Str. B1 consists of Str. B1.3 and dates to the Late Preclassic period. Radiocarbon samples were taken from the building date to 390-370 B.C., 380-350 B.C., 310-210 B.C., 360-280 B.C., and 240-190 B.C. Ceramics found in this structure were similar to Mamom sphere ceramics from the Maya lowlands (Garber et al. 2002:44). The most common group of Mamom ceramics at Blackman Eddy are the Savannah and Jocote group with several Juventud, Chichuanta, and Patal groups represented as well (Garber et al. 2002:44).

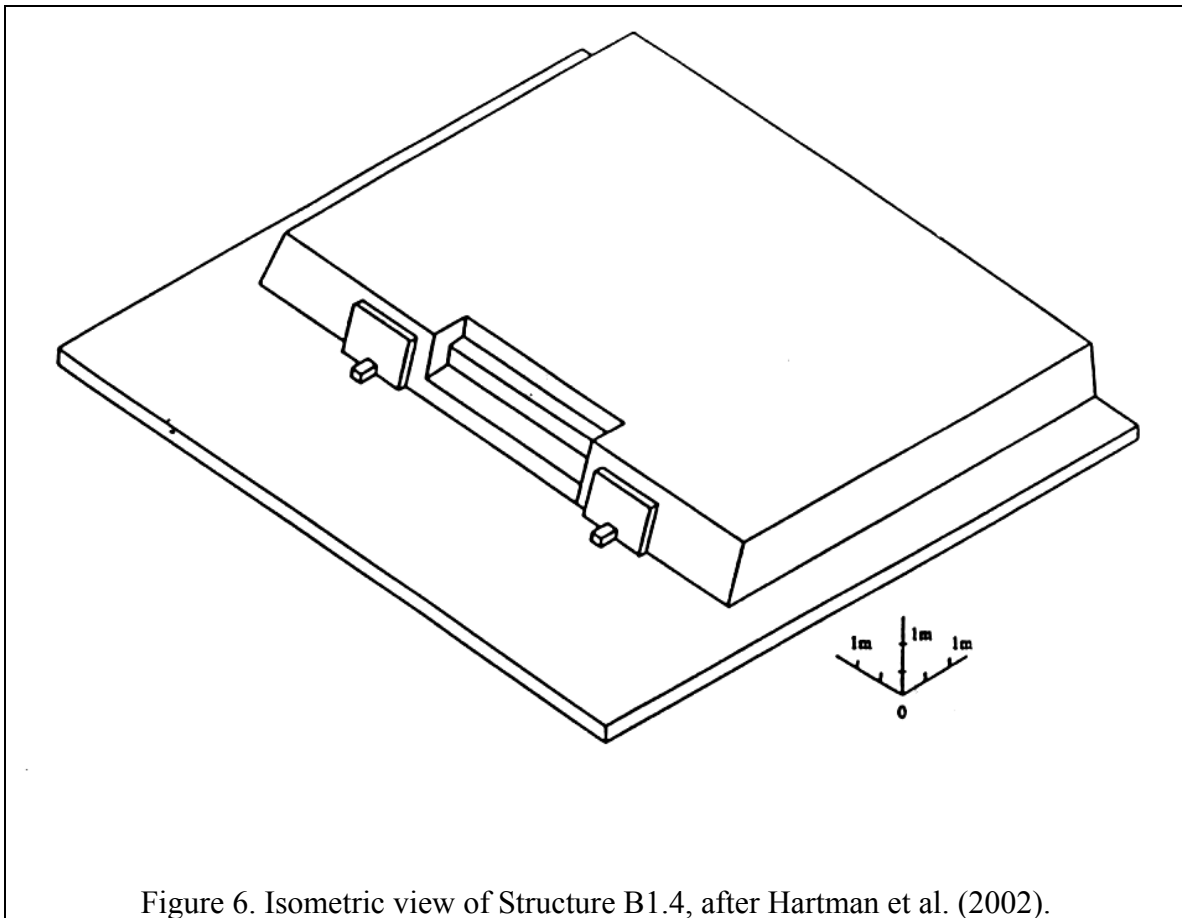


Figure 6. Isometric view of Structure B1.4, after Hartman et al. (2002).

Str. B1.3 is a three-tiered structure with a small upper summit platform (Figure 7). Str. B1.3 measures 13.5 meter north-south by 9.0 m east-west and is 1.5 m high above the associated plaza floor (Hartman et al. 2002:26). Structure B1.3 was built of trimmed limestone blocks covered with limestone plaster. The blocks used in construction of Str. B1.3 were extremely large, averaging 80 x 40 x 30 cm in size (Hartman et al. 2002:26). Str. B1.3 did have several inset staircases, but no stucco masks were found. Associated with Str B1.3 is a smaller structure to the east designated Str. B2. This structure is a two-tiered structure 1.5 m in height (Hartman et al. 2002:26). The increase in the size of trimmed limestone blocks used in building construction indicate that the labor costs

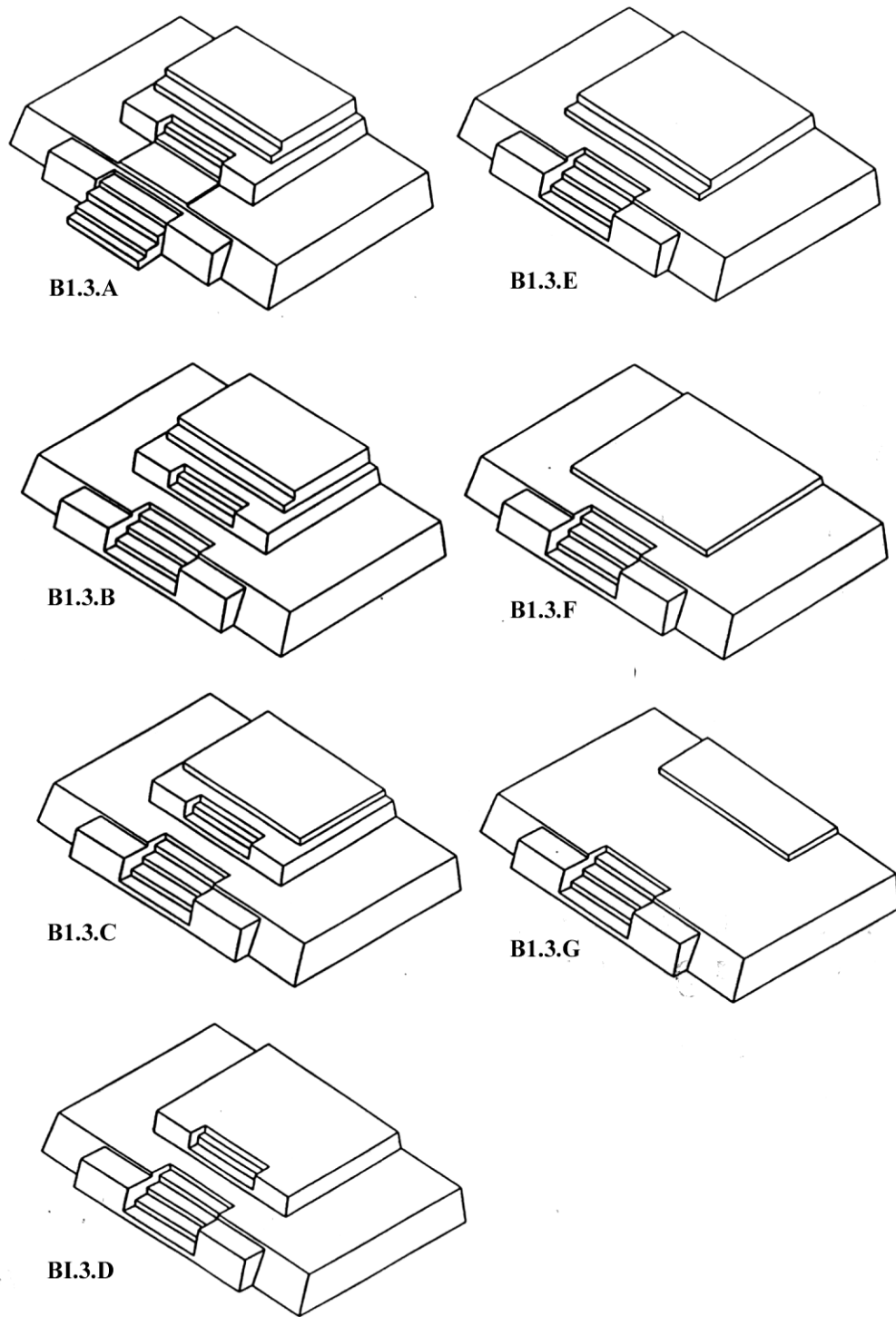


Figure 7. Isometric view of the construction episodes of Structure B1.3, after Hartman et al. 2001.

associated with the building increased when compared to the previous construction episode. During its lifetime, Str B1.3 experienced a high level of construction activity, with seven sub-phases of construction, more than any other buildings.

Construction Episode 7

The final construction episode consists of Str. B1.2 (Figure 8). Structure B1.2 is a two-tiered, pyramid structure dating between the Late Preclassic and Classic periods (Garber et al. 1993:7). Ceramics from the construction fill for Structure B1.2 are similar to ceramics from the Spanish Lookout phase of Barton Ramie (Garber et al. 1992:9). Other sherds recovered from Structure B1.2 date between the Late Preclassic and Early Classic period and include two partial vessels, a partial bowl, partial necked jar, partial plate and two partial mamiform tripods (Garber et al. 1995:9).

Structure B1.2 extends the front (south) side of Structure B1.3 in a series of three or four deep terraces, and it has an overall height of 3.32 m. During its lifetime, Structure B1.2 had three sub-phases of construction, designated B1.2A B1.2B and B1.2C (Garber et al. 1995:7). The first sub-phase of construction was designated Str. B1.2C. Most of Str. B1.2C was removed in antiquity to build Str. B1.2B, so its actual dimensions are not known. Str. B1.2B was a two-tiered structure measuring 1.55 m. in height (Hartman and Pagliaro 2000:27). The lower tier of Structure B1.2B measures 10.1 m. north-south by 12.2 m. east west. The upper tier of B1.2B measured 3.7 m. north-south by 2.4 m. east-west. The entire structure was constructed of trimmed limestone blocks 25 x 13x 2 cm in size (Hartman and Pagliaro 2000:27). The construction fill used for Structure B1.2B was

large rubble fill and gray-brown soil matrix, and it was covered by a yellowish-white plaster.

Structure B1.2B was also adorned with stucco masks (Garber et al. 1997c:8). The masks retained no distinguishable iconographic features, but they did retain traces of red pigment used in the painting of the stucco masks (Garber et al. 1996:10). One of the upper masks had sufficient detail remaining on the plaster façade to show several Classic period elements on it. The upper panel contained partially preserved circular elements interpreted as ear-flares. In profile, the lower panel showed an outwardly flaring bowl with three large dots within the bowl representing the three-stoned place of creation (Garber et al. 1993:9). Also constructed at this time were eight steps central staircase set 1.9 m. from the base of the central staircase.

Str. B1.2A represents the final construction sub-phase for Structure B1.2. This building was mostly an expansion of Str. B1.2B., increasing the width of the lower tier of building about a half meter using the same limestone masonry from the previous construction sub-episode. Many of the additions made during the B1.2B sub-episode carry over into this phase. Additions, such as a central staircase, lower and upper terrace masks, and panels, were also found on Str. B1.2A. Though the exact dimensions of Structure B1.2A are not known because of the bulldozer cut, the basal tier dimensions have been estimated to be about 13.1 m. north-south by 12.6 m. east-west. The summit of B1.2A had a yellow plaster surface 17 cm. thick which was underlain by a dry rubble fill.

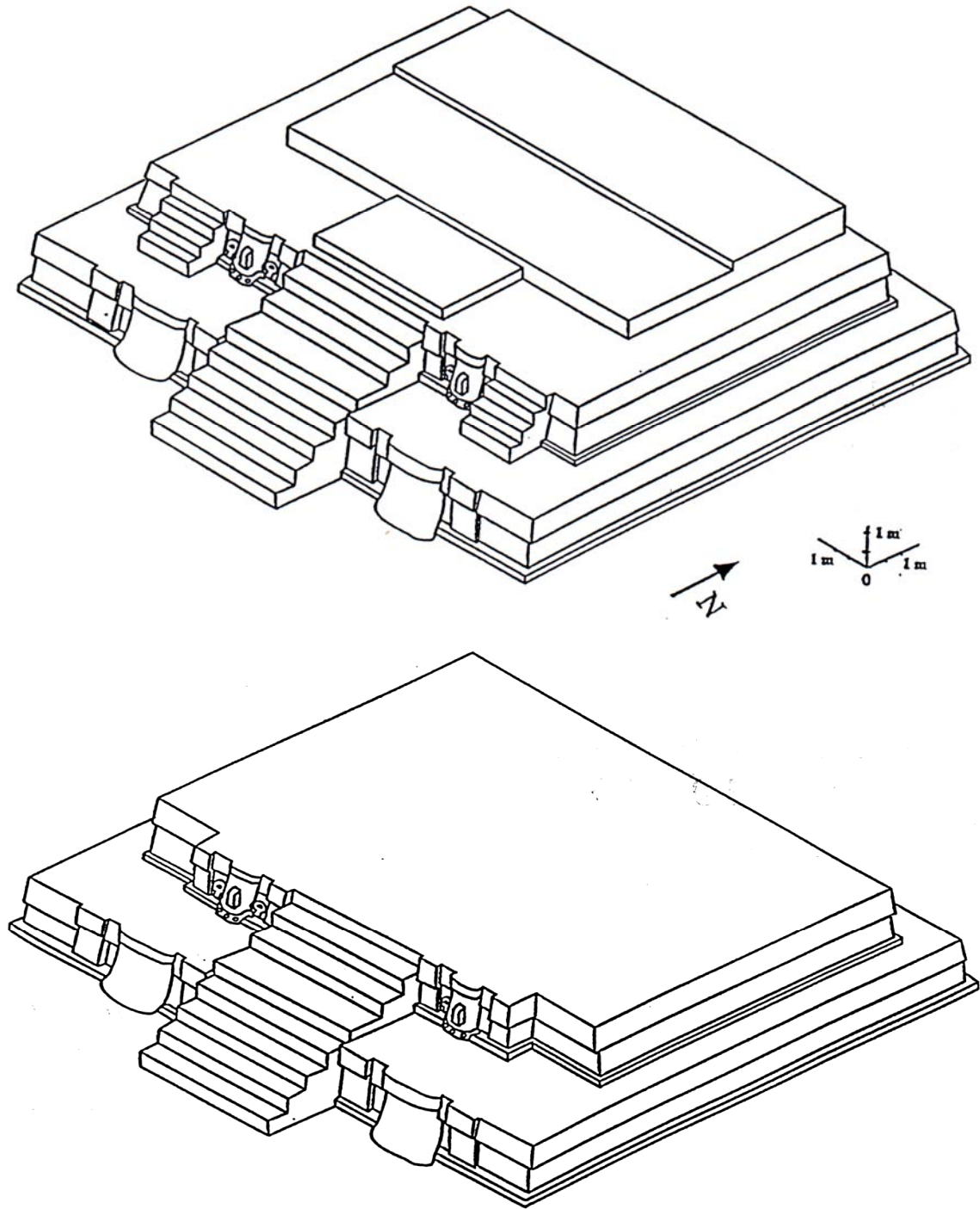


Figure 8. Isometric view of Structures B1.2A (top) and B1.2B (Bottom), after Brown et al. (2000).

Discussion

Because of its long architectural sequence, Str. B1 at Blackman Eddy can provide archaeological evidence for social change over time. In her analysis of the emergence of complex society at Blackman Eddy, Brown divides the architecture of Str. B1 into three phases: the Domestic architecture phase, the Public/Integrative phase, and the Monumental structural phase (Brown 2003). The division of the different buildings into these three phases was based on architectural style, architectural elaboration, and associated ritual deposits (Brown 2003:151).

The first architectural phase Str. B1 consists of Str B1.13 through B1.8. As the name implies, the buildings from this phase were domestic in nature because they share many characteristics in their form and function with common lowland Maya houses. First, the buildings from this phase were pole structures circular/apsidal shape. Second, these buildings were not very large, averaging between 6-8 m in diameter. Finally, significant amounts of daub found in and around these structures indicate that they were likely thatched with mud, wattle, and vine.

The artifacts and features found associated with this first phase also reflect the domestic nature of these buildings. First, a large number of domestic items, including mano and metate fragments, bone implements, and ceramic spindle whorls were found associated with Phase 1 (Brown 2003:100). Another class of domestic artifacts found in significant numbers in this early phase were ceramic figurines (Brown 2003:101). Figurines have been documented in domestic ritual setting across all of Mesoamerica in both archaeological and ethnographic studies, and it is likely that their presence in these early structures indicates their function. Second, a fire hearth and several midden

deposits, all domestic in nature, were found cut into the bedrock next to these early buildings (Brown 2003:100).

The next phase in the architectural history of Str. B1 is the Public/Integrative phase and consists of Str B1.7, B1.6, B1.5, and B1.4 (Brown 2003). These building of these platforms represent a considerable increase in labor investment and construction costs compared to the previous phase (Brown 2003:114). First, the buildings from phase 2 were built with a dry-laid rubble core sustained by an outer shell of trimmed limestone blocks. Second, a plaster coating was applied to the exterior as well. The application of a plaster coat to the exterior of these structures is a particular important construction cost because of the time and materials (particularly fuel) needed to heat and crush limestone to make plaster.

The change in form of the structures during Phase 2 indicates that the function of Str. B1 changed. During the public integrative phase, rectangular platforms replaced the circular pole-and-thatch structures of Phase 1. The buildings from this phase represent the first clear evidence for either public community buildings or elite residences at Blackman Eddy (Brown 2003:114). Also, the change from an enclosed to more open building form during this phase represents an increased emphasis on communal ritual activity (Brown 2003:114). These patterns are accentuated even further with the construction of Str. B1.5 and B1.4 during the latter part of this period.

Several deposits also indicate that there was a shift in building function from domestic to public rituals. First, a ritual deposit was found south of Strs. B1.6 and B1.7. This feature, designated BR-F2, was a basin-shaped depression cut into bedrock. This feature was lined by 15,000 riverine shell placed in layers, with small jute shells at the

base, riverine shells placed above, and large jute and pamancea placed on top (Brown 2003:116). The intentional placing of different layers of shell suggests that this feature was the receptacle for an elaborate ritual deposit (Brown 2003:116). This pattern of depositional caching was quite different from those associated in the first period, and the increased elaboration may indicate a change to a more public function for Str. B1. Second, possible evidence of a feasting event was located “west of the platforms in the form of a deposit that consisted of smashed vessels, numerous riverine bivalve and jute shells, faunal remains, and lithic flakes that extend over a wide area” (Brown 2003:116). This deposit was interpreted as the remains of an early feasting event at Blackman Eddy.

Feasting rituals have been associated with the emergence of rank societies in Mesoamerica (Clark and Blake 1991). In this model, aggrandizers within the community compete with each other for prestige in the form of recognized support by a coalition or faction. This competition is motivated by the personal ambition of individuals in the community.

Aggrandizement is primarily a political process based on the principle of reciprocity (Clark and Blake 1994:21). Reciprocal exchange is the process of gift giving between individuals. However, personal generosity creates a patron-client relationship between the giver and receiver that creates social obligations for the client on behalf of the patron (Mauss 1967). Through the sponsoring of feasting rituals, usually involving rare or exotic foods, aggrandizers create social obligations with community members. Aggrandizers may then call upon ritual participants for economic, political, or social support. Successful aggrandizers maintain a positive balance of obligations with their supporters through the regular bestowal of gifts and favors to their coalition that, over

time, may lead to the institution of social inequalities (Clark and Blake 1994:21). At Blackman Eddy, feasting rituals may have been used by aggrandizers in the local community as a way to sponsor the building of public buildings, such as the rectangular platforms from Str. B1. If feasting rituals were used at Blackman Eddy as a means for aggrandizers to gain political support, the process may have led to institutionalized social inequalities, like those found in a chiefdom, after a few generations. Feasting rituals may have been the means by which labor power was acquired for the subsequent additions to Str. B1.

With the construction of Str B1.5, single platform structures were replaced by multi-tiered structures. Again, this change increased the size of the structure its associated construction cost (Brown 2003:121). A final important architectural form that first appeared during this phase was the use of stucco masks facades as decoration. This form was found only in the last building of the phase (Str. B1.4). Stucco masks have been reported in detail for Late Preclassic buildings at El Mirador, Uaxactun, and Cerros, and this type of architectural is the representation of the centralization of religious and political power together in an architectural presentation of the symbol system of kingship (Freidel and Schele 1988). The presence of stucco masks at Blackman Eddy at the end of this phase “does not suggest that the institution of kingship was present at this early date, but rather that the ideological concepts which would have allowed the transition to and acceptance of the institution of kingship were in the early stages of development” (Brown 2003:138). In any case, the inferred increases in construction costs, shift in building function, change in building form, and introduction of the institution of kingship at the end of phase 2 implies that elite power significantly increased during this period.

The monumental structural phase is the third and final architectural phase. The buildings associated with this period are Str. B1.3, Str. B1.2, and Str. B1.1. During this period, building patterns shifted from the construction of rectangular platform structures to large pyramids (Brown 2003:139). This change in form from open platforms to restricted pyramids indicates that building function changed from open communal rituals to restricted rituals, most likely performed by select members of the community (Brown 2003:153). Not only did these buildings restrict ritual participation, the height of these pyramids elevated the individual(s) involved in ritual activities literally and figuratively above all observes. In addition to the pyramid form itself, the use of stucco masks with lowland motifs, continued to place in public view the symbols of kingship (Brown 2003:153). Also during this phase, there was a shift from ritual deposits associated with public events to single vessel caching. This was an important change because it signals a change in ritual behavior from communal caching to a more restrictive form of caching behavior (Brown 2003:140). For example, only a single Jouventud vessel was placed in plaza surface associated with Str. B1.3D or B1.3E; it was the only ritual deposit found associated with these buildings. All of these patterns were used to legitimize and centralize social power into the hands of fewer individuals than in the last period, indicating a highly stratified social system existed at this time at Blackman Eddy.

The third architectural period was marked by both increasing labor and material costs associated with building construction (Brown 2003:138). First, the size of the limestone blocks used in building construction increased in size during this period (Brown 2003:141). Second, the number of decorative elements on the buildings from this period (stucco masks, inset staircases, outset platforms) increased. Finally, building

intensity increased during this period based on the number of construction sub-phases. Str. B1.3 and B1.2 had eight sub-phases of construction between them, more than any other architectural period. Like the architectural motifs, the trends in construction costs also indicate a potential increase in social stratification during the Monumental structural period.

However, it is very difficult to quantify many of these increases in labor costs associated with stucco masks, trimmed limestone blocks, and inset staircases. While these additions did increase the labor costs associated with the construction of buildings, a more quantifiable way to examine increasing labor is to estimate the overall increase in building volume for each of the building within Str. B1. The assumption here is that increases in building volume correlate to greater control over labor power by an elite class. As elite power grows, they are able to build larger, more elaborate buildings. Unfortunately, the exact volume for each of buildings in the seven construction episodes is not known due to poor preservation, lack of total exposure from some construction episodes, and the intentional destruction of some structures in antiquity. However, I believe that enough data are available to gauge the general trend in building intensity over time. To calculate the volume of the buildings from the Construction Episodes 1 and 2, I used the formula for the volume of a cylinder ($\text{Height} \times R^2$) because of their round shape. The building volume for Construction Episodes 3 and 4 was calculated using the formula for the volume of a rectangle ($\text{Length} \times \text{Width} \times \text{Height}$). For Construction Episodes 5, 6, and 7, the geometric formula for a pyramid was used to determine building volume ($\text{Length} \times \text{Width} \times \text{Height} / 3$). Because each structure was built on top of another structure, I subtracted the volume of the previous structure to find the overall volume for

Structure	Length	Width	Height	Volume	Adjusted Volume
B1.11	6.2m	6.2m	0.01m	0.95m ³	0.94m ³
B1.10	6.2m	6.2m	0.01m	0.95m ³	0.94m ³
B1.8	7.5m	7.5m	0.1m	5.63m ³	4.68m ³
B1.7	6.16m	6.16m	0.27m	10.25m ³	4.62m ³
B1.6	6.16m	6.16m	0.5m	18.97m ³	8.73m ³
B1.5	7.1m	7.1m	0.68m	34.28m ³	15.31m ³
B1.4	9.75m	9.75m	1.5m	47.53m ³	13.25m ³
B1.3G	11m	11m	1.5m	60.50m ³	12.97m ³
B1.3A	11m	11m	3.4m	137.13m ³	27.17m ³
B1.2B	17m	17m	3.32m	319.83m ³	182.69m ³
B1.2A	17m	17m	3.92m	377.63m ³	57.80m ³

Table 3. Building Volume and Adjusted Volume for Str. B1

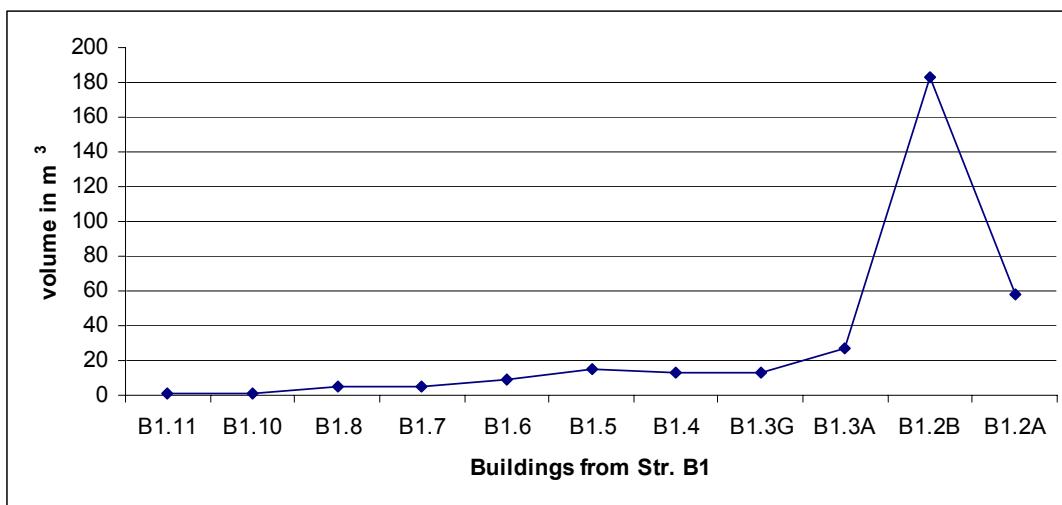


Figure 9. Estimated Volume of buildings from Structure B1.

each addition (Table 1). The calculated volume per structure indicates that Str. B1 increased slowly over time until the final construction episode (Figure 9). The reason for this variability in building volume over time may be due to the fact that several of the buildings (Str. B1.6, B1.4, and B3.A) were only slight modifications to their predecessors. Elite power appears to have grown very slowly over time based on the overall increase in building volume over time, and the elite may not have had strong social control over the general population during the Middle Preclassic period.

A dramatic increase in building volume occurred during the Classic period with the construction of Str. B1.2B, indicating that a comparatively tremendous amount of labor power went into the construction of this structure. The drop in building volume with the initial construction of Str. B1.2A may be due to the fact that this building was mostly an addition to Str. B1.2B. The dramatic increase in labor activity associated with the buildings from this last phase indicates that the elite class at Blackman Eddy could organize labor power in a manner previously unknown at there, clearly indicating a move to a more stratified social organization at the site. This may have occurred as Blackman Eddy was integrated into a large regional polity like a paramount chiefdom or early state.

Regional polities constitute the world of law and legal force that guarantees order among sedentary communities organized hierarchically (Johnson and Earle 2000:247). These societies are quite large in size and have a political organization more complex than a simple chiefdom, though the actual scale and internal integration of regional polities can be variable. With the integration of communities into regional polities, access to economic resources and political power becomes more restricted (Freid 1960). This consolidation of economic and political power into a larger socio-political system may create new exchange

opportunities for the elite class as access to goods from even larger areas than could be accessed by a simple chiefdom alone.

Based on the architectural data from Str. B1, there were two important social changes that occurred at Blackman Eddy during its history (Brown 2003). The first major social change occurred during the third construction episode in the Middle Preclassic period when Blackman Eddy transitioned to an emergent chiefdom. The second change occurred during the seventh construction episode in the early part of the Classic period. At this time Blackman Eddy was likely integrated into a larger, more stratified chiefdom or state. If there were significant changes in the social structure of Blackman Eddy during these two periods, then there should be a simultaneous change in the exchange, production, and/or function of the chipped stone artifacts from Str. B1 of Blackman Eddy during these periods of social change as well. In the next chapter, I will describe the methods I used to try study the chipped stone tools of Blackman Eddy.

Chapter 2- Methods and Procedures for the Study of the Chipped Stone Tool Industries of Blackman Eddy

Introduction

In this chapter, I discuss the objectives, assumptions, and methods used to analyze the chipped stone artifacts from Blackman Eddy. While chipped stone tools are not the only type of stone tool found at Blackman Eddy, this category was used exclusively in this study because it provided me with the greatest analytical yield based on my knowledge level and the time restraints I had for conducting research in the field. Another reason why I chose to analyze chipped stone tools was because they are a significant stone tool category used in many other archaeological studies in this region, and this provided me with a significant amount of literature and data to use for comparative analysis.

The main objective of my thesis is to look at the various chipped stone tool industries of Blackman Eddy for changes that correspond in time to the social changes inferred from the architectural changes of Str. B1 (Chapter 1). To accomplish this, I needed to identify variation in artifacts from the various construction episodes and correlate that variation to social change. This required me to develop methods to both organize the artifacts in temporal sequences and study them in a systematic way to infer social change. First, I will discuss the methods I used to organize the chipped stone tools temporally.

Organizational Assumptions and Methods

Because the different buildings of Str. B1 were constructed on top of one another, the entire structure represents a well-preserved stratigraphic sequence which can be divided and analyzed in discrete temporal units. In the previous chapter, I discussed the criteria I used to organize the various buildings of Str. B1 into seven construction episodes. Each construction episode represents a single temporal sequence, and the artifacts from each construction episode represent materials from that period. If these assumptions are true, then any changes in the attributes of chipped stone artifacts between construction episodes can be interpreted as change over time in the chipped stone industries of Blackman Eddy.

The chipped stone artifacts of Blackman Eddy come from two different collections (small finds and general collections). As a result, a different method was adopted for selecting artifacts from each collection. The chipped stone tools in the small finds collection consists of all obsidian artifacts, quartz artifacts, and formal tool types (bifaces, drills, blades, burins, and adzes) made from obsidian, quartz, quartzite, or chert recovered from excavations in Str. B1. All chipped stone tools from the “small finds” collection present in the collection at the time of this study were analyzed, classified, and recorded on to a spreadsheet along with the corresponding lot and operation number from which the artifact came. Artifacts from the general collection were recorded in a similar manner according to lot and operation.

The chipped stone artifacts from the general collection consist of all chert, quartz, and quartzite artifacts not identified as a formal tool type recovered from excavations in Str. B1. This includes a large number of various types of chert artifacts. Because the

number of artifacts in the general lithic collection was too large to examine for this study, samples of artifacts from deposits associated with the seven construction episodes were collected as representative of the entire collection. Before selecting bags of artifacts to analyze, I examined the excavation records from Blackman Eddy and organized the various operation and lots numbers according to construction episode. This provided me with a “temporal” view of the artifacts.

Next, I eliminated operations from my selection that had contained mixed artifacts across construction episodes. Because one of the assumptions of this thesis is that artifacts from each building represented materials from that period, I tried to avoid using artifacts from operations that had overlapping construction episodes. My original goal was to get ten “pure” samples of chipped stone artifacts from each construction episode. This would provide me with a balanced sample of artifacts from each construction episode. However, some buildings did not have ten pure lots to sample from. Furthermore, each bag contained a variable number of individual chipped stone artifacts. Because of these two problems, the number of sampled artifacts from some construction episodes was much greater than others. In order to compare the various attributes of artifacts across the different construction episodes, the attribute numbers were divided by the total number of sampled artifacts sampled from each episode. This created a weighted average for comparison that was not biased by the sample size from each construction episode (see the index for a complete list of raw numbers and weighted averages for each attribute). Next, I will discuss the assumptions and procedures I used in my analysis of the sampled artifacts from the seven construction episodes of Str. B1 of Blackman Eddy.

Analytical Assumptions and Procedures

As stated earlier, the main goal of this thesis is to search for change over time in the chipped stone tool industries of Blackman Eddy. The four chipped stone tool industries at Blackman Eddy are the chert flake, obsidian flake, chert biface, and obsidian prismatic blade industries. An industry is “a manufacturing or productive enterprise focusing on raw material and involving certain common means of processing that material” (Sheets 1975:372). Quartzite was not considered as an industry in this study because most of the quartzite artifacts were classified as flakes from hammerstones and quartzite was not commonly processed into other tools. Using Sheet’s definition, two important analytical elements are the raw materials used in tool production and the manufacturing techniques used in each chipped stone tool industry. The third important element is tool function. To study each of these elements and how they may have changed over time, this study looked at the attributes associated with raw material exchange, chipped stone tool production, and tool use (function) of chipped stone artifacts from Str. B1. The examination of each of these three elements required their own set of assumptions, procedures, and units of analysis.

Raw Material Exchange

At Blackman Eddy, change in either the attributes or quantity of raw materials from one construction episode to another may be an indication of social change over time. Before I could study change in the exchange patterns of chipped stone tools at Blackman Eddy, I needed a method that could archaeologically identify the regional exchange. The

presence of certain types of raw materials in regions where they do not occur naturally is a good indication of regional exchange. Therefore, to study change in raw material types, I first needed to be able to identify the regional variations in raw materials. To accomplish this task, simple surveys were conducted in several of the different geographic regions in Belize.

Regional Survey of Raw Material Types

During the 2003 Belize Valley Archaeological Project (BVAP) field season, several surveys were conducted in the Belize River Valley and the Belize Zone near the site of Colha by John Clark, Fred Nelson, Ronald Lowe, and me to understand the type, variety, and quality of resources available for tool production. Obsidian does not occur naturally in Belize, and no raw obsidian nodules were found during these surveys. Clearly, all obsidian artifacts found at Blackman Eddy were brought into the site through regional exchange. Because quartz and quartzite are readily found in and around Blackman Eddy, it is assumed that all quartz and quartzite artifacts from the different construction episodes were locally procured.

Chert is ubiquitous across most of Belize, but the type and variety of chert between geographic zones have been variable enough to infer patterns of regional exchange (Hester 1985; McAnany 2001; McSwain 1991). Based on this information, we collected 40 chert nodules from several road cuts, riverbeds, and streams near El Pilar, Blackman Eddy, and Colha. During the latter part of the field season, two chert nodules from each of the five locations were selected and split in half or had a platform preparation flake removed to examine the characteristics of the raw material.

Our overall conclusion from this simple survey and subsequent study of raw materials was that the chert collected from each of the five different regions all had very similar raw material characteristics, and we could not distinguish the provenience of chert based on its color, texture, or cortex. This conclusion was surprising, but considering that most of Belize is a continuous shelf of chert-bearing limestone of similar geologic age, it should not have been unexpected. The similarities in raw material characteristics from the five regions make it nearly impossible to reconstruct networks of exchange of raw chert without the aid of trace element analysis.

Two important differences in the samples examined from the 2003 surveys were the much lower frequency of inclusions and higher frequency of chert with patination in samples from Colha. After the completion of the regional survey and an initial analysis of chipped stone artifacts, the raw material attributes I used to identify regional exchange patterns at Blackman Eddy were selected. These attributes were: raw material type, color, and translucence, and patination. Though the analysis of regional samples from the different geographic zones indicated that color and translucence may not have much predictive potential for determining regional exchange, I decided to test these attributes using data collected from the artifacts of Str. B1 to see if any trends might emerge.

Raw Material Type

The raw material types found at Blackman Eddy were obsidian, quartz, quartzite, and chert. Obsidian is an igneous rock which forms into a natural glass through the quick cooling of magma (Whittaker 1994:67). Obsidian is an easily recognizable type of raw material because of its physical properties, and all obsidian artifacts were identified

visually in this study. Obsidian has a highly vitreous look that is extremely translucent. This vitreous look and translucent nature of obsidian are similar to colored glass, making obsidian very distinct in its appearance when compared to the other raw material types. Black is the most common color for obsidian, but it has been found in other colors. In Mesoamerica, green and black are two very common obsidian colors. Obsidian is also extremely brittle and can be easily shaped (Whittaker 1994:67).

Quartz is another igneous rock commonly used in tools manufacturing and it comes in two forms: large, free standing six-sided crystals (macro-crystalline) and a micro-crystalline form (Andrefsky 2000:54). Quartz can have a glass-like luster that is often translucent or white in color, but impurities in the quartz can cause it to have different colors (Andrefsky 2000:28). For this study, Quartz artifacts were identified visually based on the physical characteristics outlined above. The quartz in this study was much lighter in color than obsidian, more translucent than chert, and did not have visible crystals like quartzite.

Quartzite is metamorphosed quartz, and it is formed from sandstone that has been subjected to an extreme process of heat and pressure. Through the metamorphic process, different-sized grains of sand and quartz interlock, giving quartzite the ability to break across individual grains (Andrefsky 2000:54). Visually and tactilely identified, quartzite differs from quartz by its large grain size, which is visible to the naked eye, and for its sandpaper-like texture. Quartzite is extremely hard, making a good percussion instrument to be used in the production of chipped stone tools.

Chert is a chemical precipitate sedimentary rock. The exact process by which chert is produced is disputed, but it involves the replacement of calcium carbonate

deposits in limestone with silica (Whittaker 1994:70). Chert is highly homogeneous in composition, though impurities are not uncommon. Most chert crystals are cryptocrystalline and can only be seen with the aid of a microscope (Andrefsky 2000:54). Like all of the other raw material types considered in this study, chert was visually identified. The dull and waxy luster of chert was another characteristic that I used to identify chert artifacts. Chert was the most colorful of the raw material types in this study, and it was found in a wide variety of different colors

Color

The second raw material attribute coded in this study was color. This attribute was selected to aid in the identification of different proveniences of raw materials. The assumption of this attribute is that raw materials of different colors come from different sources and proveniences. The color categories used in this study were: caramel, chocolate, tan, tan-white, white, gray, gray-white, black, green, and red. Caramel is a milky-tan color similar to the candy. Chocolate was a dark brown color similar to a Hershey bar in appearance. Tan-colored artifacts had a brown color lighter than caramel in appearance but closer to white on the color spectrum. Gray, black, green, and red artifacts appear like the colors used to describe them. The different color categories of the artifacts were also compared to soil colors in the 2000 Munsell's Soil Chart to give specific identifications to each of the nine color categories previously described. Artifacts that were not easily classified into one of these categories were compared to the Munsell colors to find which color was the best fit for the artifact, and artifacts with banding were

classified into a color category based on the two colors present in the banding. Banded artifacts came in two varieties: gray-white and tan-white.

Translucence

Translucence describes the ability of a lithic artifact to allow light to pass through it. Translucence was a presence or absence attribute, with an artifact classified as either translucent or opaque. All artifacts were held up to a 60 Watt bulb or natural light, and if light could be seen through the lithic artifact, it was considered to be translucent. The purpose for examining this attribute was also to aid in determining the provenience of raw materials used for tool production. Translucence in chert artifacts may be a good indicator of chert provenience, based on the assumption that artifacts from different sources will not have the same translucence.

Patination

Patination was a presence or absence category for chert artifacts, and they were classified as having or not having patination based on the visual identification of patina. Patina forms on the freshly fractured chipped-stone surface. Patination is a chemical weathering process that can be attributed to several factors: the pH of the soils, solutions in which the chert occurs, temperature, and moisture (Hester 1988:32). Over time, increased exposure of chert to these different factors increases the amount of patination of the surface. Another factor that affects the patination is the physical property of chert itself. Due to differences in the physical and chemical structures of chert, some types of chert will weather faster. Therefore, the amount of patina on chert artifacts at Blackman

Eddy would indicate the use of different chert proveniences and may be used to infer regional chert exchange.

Production Analysis

Production analysis examines the manufacturing techniques and processes used to create chipped stone tools. These processes and techniques represent past behavior patterns that cannot be observed in the archaeological record but can be inferred using ethnographic analogies with present behaviors (Binford 1967). One method that uses ethnographic analogy to infer past behaviors associated with the production of chipped stone tools is replication studies. The basic assumption of a replication study is that “the various products removed from a stone core display differing characteristics which vary according to the technique and fabricator used, the size and shape of the original core and the products removed previously. If these variables remain constant, then the same kinds of artifacts will be produced in the same order in the reduction sequence and in roughly the same relative frequency” (Clark 1988:12). By comparing the tools and by-products created in replication studies to artifacts from the various construction episodes of Blackman Eddy, inferences can be made about how artifacts were made and how these processes may have changed over time.

Reference Collection

A reference collection, “consists of replicas of stone tools organized and standardized in a systematic fashion” (Statham 1985:230). Reference collections help analysts understand how stone tools were made and used in the past. An important

assumption for using a reference collection is that similar production inputs create similar production outputs. If chipped stone tools from reference collections have similar attributes (bulb of force, platform characteristics, and the size and shape of product) as ancient artifacts, then they may have been produced in a similar manner using similar techniques. The reference collection used for comparative analysis with the artifacts from Str B1 was created from two chert nodules collected during the 2002 surveys.

The manufacturing technique used to make tools and by-products for the reference collection was direct percussion using several quartzite and metamorphic hammer-stones. First, the outer cortex was removed from the nodules to create a core. From this core, blades of various sizes and lengths were created until the core could no longer be reduced. Tools and waste by-products were collected and labeled according to type and order in the manufacturing process. All tools and by-products selected for the reference collection can be found with the artifact collections of Blackman Eddy in San Ignacio, Belize. This reference collection was essential in identifying technological types for each chipped stone tool industry.

Technological Types

The first production attribute used in this study was technological type. A technological typology is a classification system that organizes artifacts according to how and when they were made in the manufacturing sequence, and it is based on findings from stone tool replication experiments (Sheets 1975:372). The technological types in this study come primarily from the work of Don Crabtree and John Clark, and they are presented as part of the tool industry they belong to (Crabtree 1972; Clark 1988; Clark

and Bryant 1997). These technological types are: flakes, flake fragments, fortuitous blades, chunks, cores, prismatic blades, proximal prismatic blades, medial prismatic blades, distal prismatic blades, polyhedral cores, bifaces, and bifacial thinning flakes. Many of the technological types, such as flakes, flake fragments and chunks, cross-cut the four different chipped stone tool industries. Unique technological types, such as prismatic blades, polyhedral cores, and bifacial thinning flakes, are found only in their perspective tool industries. Next, I will discuss the four chipped stone tool industries and their associated technological types and manufacturing processes.

Chert Biface Industry

The manufacture of a chert biface begins with a large chert flake referred to as a biface blank or macro-flake. This blank is reduced through direct and indirect percussion on both the dorsal and ventral sides until it has developed the shape desired. Usually, the shape of a biface at this stage of production is oval in transverse cross-section (Crabtree 1972:37). Once the initial shape of the biface is created, it is shaped and thinned further by removing a series of bifacial thinning flakes through both direct and indirect percussion. The first set of thinning flakes is often produced by percussion until the biface can only be shaped and thinned further through pressure flaking. The main by-products produced from the chert biface industry are bifacial thinning flakes. The bifacial thinning flakes retain the same shape throughout the reproduction process, but the size of flakes change as the biface is reduced. The technological types associated with the chert biface industry are: bifaces, bifacial thinning flakes, flakes, and macro-flakes.

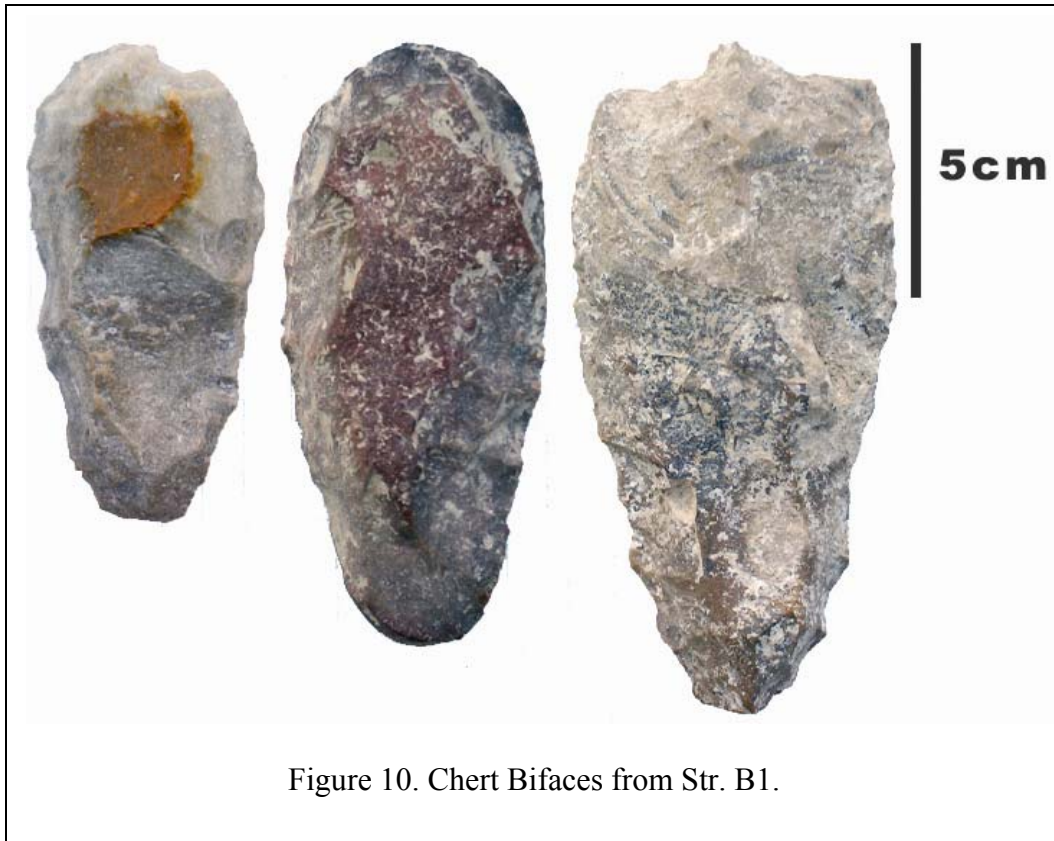


Figure 10. Chert Bifaces from Str. B1.

Bifaces are formal tools that have been worked on two faces (Crabtree 1972:38) (Figure 10). On a biface, flakes removed from both faces until there is an edge along the entire circumference of the tool. Bifaces have an oval shape in plan view and are convex in cross-section.

Bifacial thinning flakes are flakes removed in the process of shaping and thinning of a biface or uniface. Bifacial thinning flakes have an acutely-angled platform, a shape that expands out toward the distal end (Whittaker 1994:185). Bifacial thinning flakes are very thin and are slightly curved in cross-section (Whittaker 1994:187).

Macro-flakes are “large flakes removed in performing a macro-core, as well as large flakes removed in conjunction with macro-blade manufacture” (Clark 1988:16).

Macro-flakes generally have the same characteristics as flakes, but they are much larger in their size and thickness.

Chert and Obsidian Flake Industries

Though the raw materials are different in the chert flake and obsidian flake industries, the production process to create flake tools is the same. Most flake industries in Mesoamerica were simple and unspecialized (Clark 1988:15). Simple flake tools are variable in size and shape but, for the most part, only a clean, sharp edge appears to have been required for these tools. The production of these tools did not follow a set procedure but were created as needed by individuals with little knapping experience (Clark 1988:16). The manufacture of flake tools is a two- or three-step reductive process (Clark 1988:15). The process begins with the selection of a chert nodule. Next, a platform is created by either splitting the nodule in half or by removing a platform preparation flake through direct percussion. This is usually done at the quarry or site of procurement. After the platform is created, direct percussion is used to remove flakes by striking the core with a percussor (Clark 1988:12). There are several artifact types produced in the simple flake industry. These artifact types are: flakes, chunks, flake fragments, and fortuitous blades, cores, and exhausted cores.

A **flake** is “any mass of stone removed from a larger mass by the application of force—either intentional, accidentally, or by nature” (Crabtree 1972:64). Flakes are diagnostically characterized by having a platform and bulb of force at in their proximal end. The flake may be of any size or dimension, but these characteristics are dependent on how and when it was removed from the core (Figure 11).

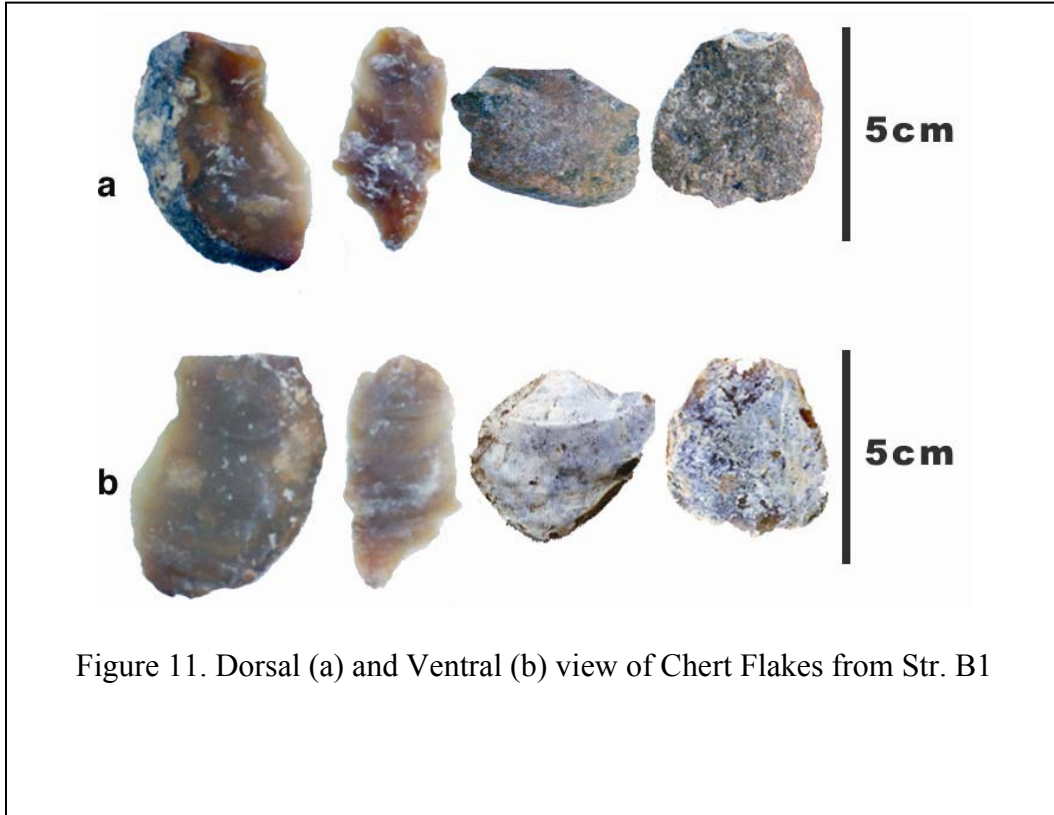


Figure 11. Dorsal (a) and Ventral (b) view of Chert Flakes from Str. B1

Flake Fragments are similar in shape as flakes, but they lack the diagnostic platform and bulb of percussion at the proximal end (Clark 1988:16) (Figure 12).

Chunks are the angular, blocky fragments of a core sometimes referred to as shatter or thick flakes (Clark 1988:16) (Figure 13).

Cores are masses of “material often preformed by the worker to the desired shape to allow the removal of a definite type of flake or blade and contain negative flake



Figure 12. Dorsal (a) and Ventral (b) View of Flake Fragments.



Figure 13. Dorsal (a) and Ventral (b) View of Chunks from Str. B1.

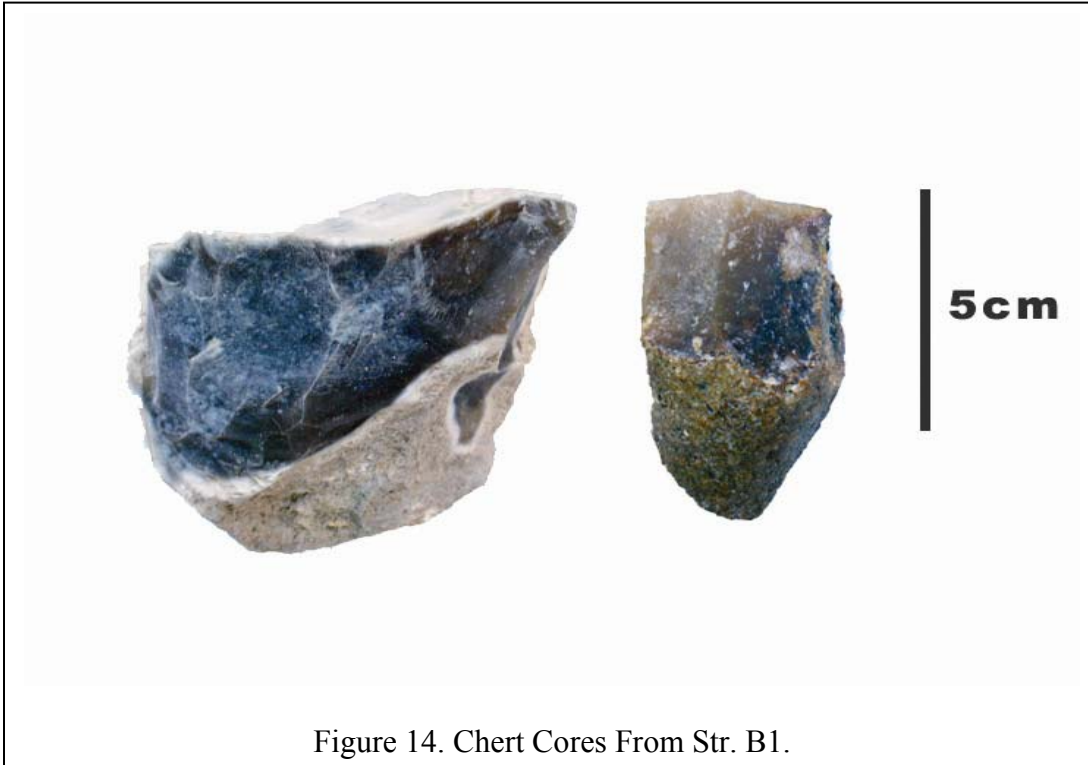


Figure 14. Chert Cores From Str. B1.

scarring from the removal flakes” (Crabtree 1972:54) (Figure 14). When no further flakes can be removed, it is classified as an **exhausted core**. Sometimes an exhausted core is further reduced through bipolar percussion (direct percussion with an anvil) in which case the core is classified as a **bipolar core** (Clark 1988:18).

Blades are “a specialized flake with parallel or sub-parallel lateral edges” (Crabtree 1972:42). The length of the blade is longer than its width, usually at least twice as long as wide. A blade is plano-convex, triangulate, trapezoidal, or rectangular in cross-section. Blades are not produced randomly (Crabtree 1972:42).

Fortuitous blades are flakes that appear to be “random accidents of expedient knapping” rather than a purposeful tool, but they have the same general characteristic of a blade; they are twice as long as they are wide (Clark 1988:51).

Obsidian Prismatic Blade Industry

Unlike the chert flake industry, the production of prismatic blades requires a high-level of technical knowledge and experience to produce because this process involves several different steps and manufacturing techniques (Clark and Bryant 1997:115). The initial stages of production for prismatic blades are similar to those for the simple chert industry. The products removed in this stage are primarily **obsidian flakes, flake fragments, and fortuitous obsidian blades**. First, direct percussion is used to remove a platform preparation flake from the nodule. After the initial removal of the platform preparation flake, the core is referred to as a core perform (Clark and Bryant 1997:115). Once the platform is created, flakes and chunks are removed perpendicular to the platform.

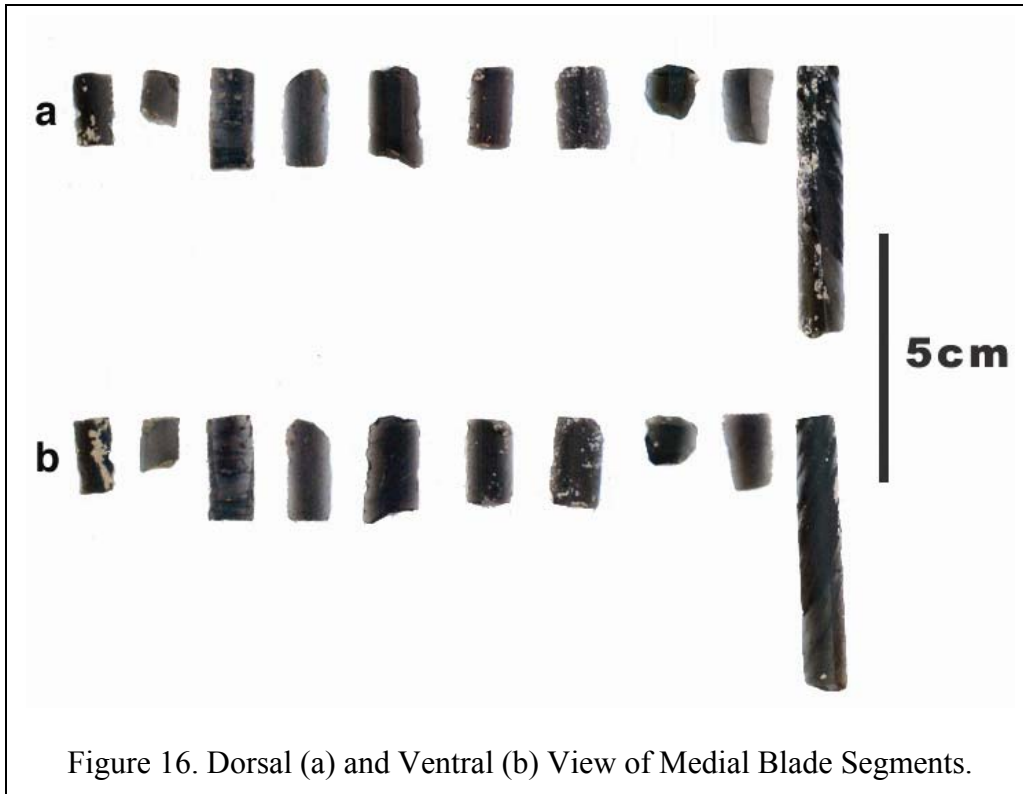
To distinguish production sequences, two types of macro-cores are defined by Clark and Bryant in their core reduction sequence, macro-core I and macro-core II. Macro-cores I are formed by removing very large flakes, usually at the quarry site, and macro-core II are a later stage that correspond to the removal of macro-flakes (Clark and Bryant 1997:114). The objective in this stage is not only to remove flakes for tools but to shape the core for the removal of blades while preserving as much of the raw material as possible for blade production (Clark 1988:12). Once the core is properly shaped into a polyhedral core pressure flaking is used to remove blades. Pressure flaking pushes obsidian blades from the platform of a polyhedral core through the use of a flaking device (Clark 1982). The goal in this stage of production is to produce long obsidian blades which are triangular or trapezoidal in transverse cross section. As each blade is pressed



Figure 15. Dorsal (a) and Ventral (b) View of Obsidian Proximal Blade Fragments.

off, the core is rotated and a new set of blades are pressed off the core until no further blades can be pressed off and the core is exhausted (Clark and Bryant 1997:114).

Prismatic blades are “long, narrow specialized flakes with parallel sides generally triangulate or trapezoidal in cross-section and bearing two or three prism facets on the dorsal side” (Crabtree 1972:86). Blade fragments are classified as **proximal** (Figure 15), **medial** (Figure 16), or **distal blade segments** (Figure 17) according to what portion of the blade is found (Clark 1988:15). There are three main categories of blades produced from pressure flaking: **first, second, and final series blades** (Clark and Bryant



1997:114). These blades are classified according to when they are removed from the polyhedral core. **First series blades** are short and wide blades that can be identified by the percussion scars that remain on their dorsal face but show pressure scars and bulbar characteristics on their ventral side (Clark and Bryant 1997:114).

Second series blades are longer and thinner than first series blades and have the same characteristics for percussion flaking on their ventral face, but the percussion scarring on the dorsal face is limited to the distal end of the blade (Clark and Bryant 1997).

Final series blades are long thin blades that do not contain any percussion scarring on their dorsal face (Clark and Bryant 1997:114). All prismatic blades examined from the collections of Blackman Eddy were classified as final series blades.

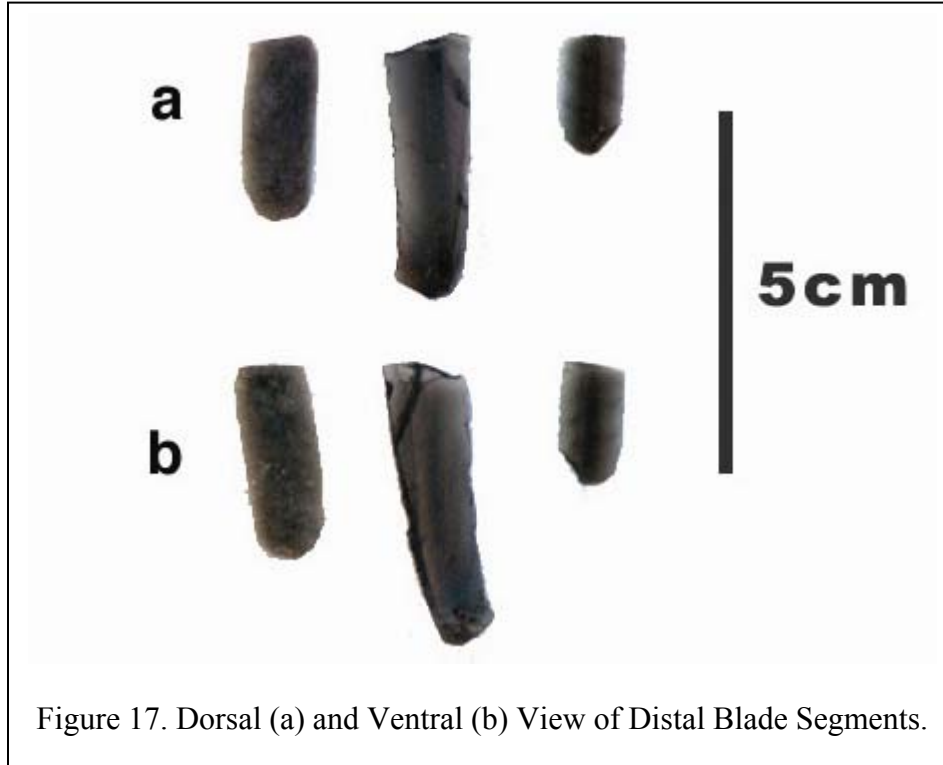


Figure 17. Dorsal (a) and Ventral (b) View of Distal Blade Segments.

A **Polyhedral core** is a core bearing multiple blade scars, cylindrical in cross-section (Crabtree 1972:84). Polyhedral cores are made for the manufacture of prismatic blades. **Exhausted polyhedral cores** are expended cores that can no longer produce blades through pressure flaking.

Cortex

Another production attribute examined in this study was the amount of cortex present on chipped stone artifacts. Cortex was a presence or absence attribute identified in artifacts having 50 percent or more of their dorsal side covered with cortex. This attribute was selected to help infer w the production of chipped stone tools from the different industries took place locally. If a high number of chipped stone artifacts have

cortex, then this indicates that nodules were brought into the site to be shaped into tools. If tools from the different industries have no cortex present on them, then it is possible that they were not produced locally at Blackman Eddy.

Size and Weight

Another production attribute used in this study was artifact size. This attribute can be used to help infer the size of cores and nodules used to produce tools in the various construction episodes. Because chipped stone tool manufacturing is a reductive process, the presence of large artifacts in significant quantities within a collection suggests that large-sized cores were used to produce chipped stone tools. Though small flakes can be produced from large cores and nodules, the presence of only smaller-sized artifacts suggests that smaller cores and nodules were used to produce chipped stone artifacts at Blackman Eddy.

All artifacts from Blackman Eddy were sorted into size categories by comparing them measuring their longest dimension along a line. Based on this method, all of the lithic artifacts sampled in this study were classified into one of four size categories: 1, 2, 3 and 4. All artifacts that had a maximum length or dimension equal to or less than 3 cm on their longest edge were classified as Size 1. All Size 2 chipped stone artifacts had a length or dimension between 3 and 6 cm. Size 3 chipped stone artifacts were those with a length between 6 and 9 cm in size. Size 4 artifacts were those that had a maximum length or dimension equal to or greater than 9 cm. By using this method to examine artifact size, I was able to sort and size a large number of artifacts in a relatively short period of time.

The final production attribute of this study was artifact weight. All artifacts sampled in this study were weighed on a digital scale. Unfortunately, some of the smaller sized artifacts weighed less than 0.1 grams and the scale could not detect their weight. As a result, artifacts that weighed less than 0.1 grams were assigned a weight of 0.05 grams. The weight of artifacts, like their size, can be used to infer the size of the core from which they were removed. The main assumption is that artifacts with higher weight were removed from cores with a larger mass.

Functional Analysis

The function of a chipped stone artifact refers to how it was used. Artifact function can be a very complicated, depending on the individual life-history of the artifact. Artifacts can be used and re-used in a variety of different ways, but these activities leave wear patterns on artifacts through frequent use. Use-wear analysis is a method employed to obtain an objective assessment of prehistoric stone tool use (Sheets 1975:370). Use-wear studies look at the function of tools to determine how tools may have been utilized. To understand tool use for the various chipped stone tool industries of Blackman Eddy, I examined artifacts for use-wear patterns along their edges.

In use-wear studies, replicated artifacts are used in a variety of activities. These activities cause micro-chipping wear patterns to develop on the tool's active edge. The wear patterns left on the replicated tools from known experimental tasks can then be compared to scar patterns found on prehistoric artifacts. The assumption in these studies is that similar micro-chipping patterns result from similar usages. At the suggestion of John Clark, several replicated tools were used to cut, drill, scrape and engrave wood and

slate. First, eight flakes were selected from the reference collection (two for each type of activity) and were then used in several use-wear activities to create wear on each tool. Next, I created a cutting use-wear pattern on two replicated chert flakes by moving the lateral edge of a chert flake across a wooden board in a back-and-forth motion 30- 50 times until a distinctive wear pattern was discernable to the naked eye.

To create scraping use-wear patterns, the lateral edges of two chert flakes were pressed and moved across a piece of lumber in a single direction 30- 50 times until noticeable scraping wear could be seen. Drill use-wear was produced by twisting two chert splinters into a single piece of slate until the drill's tip was significantly worn down and the distal end was smooth from shearing. Two Burins were created from two flakes selected from the reference collection. This was done by using the distal end of the flake as a platform and removing a burin spall parallel to the flake's lateral edge similar to the technique discussed by Don Crabtree (Crabtree 1972:48). After the burin tools were created, I moved the burin tip across a piece of lumber 30- 50 times until noticeable use-wear patterns developed on the burins tips.

The four categories of micro-chipping used in my study were scraping, cutting/sawing, engraving, and drilling (Tringham et al. 1974). Cutting use-wear patterns represent the one-way longitudinal movement of tools, and the distribution of chipping scars along the worked surface is uneven but not random (Tringham et al 1974:188). In sawing wear patterns (two-way movement), the scar distribution and characteristics are similar as cutting wear patterns, but scars occur in greater density across the edge of the worked material (Tringham et al. 1974:188). Drilling (boring) wear patterns form when the worked material is moved in a circular motion, held at angles of 70-90 degrees

(Tringham et al. 1974:189). Drilling scars include distinctive trapezoidal scars found especially on the point of projection rather than the tip of contact (Tringham et al. 1974:189). Drills also have a high amount of polish and striations across much of the surface and edges as well. Gravers are tools used to engrave materials and they are often found in the form of burins. Burins are chisel-like instruments derived from flakes or blades and they are made by removing an edge parallel to the instrument's long axis to form a right angle edge (Crabtree 1972:48). Use-wear on burin is found on the tip and has the same scarring patterns as cutting use-wear

Thermal Alteration

The final attribute of this study was thermal alteration. This was a presence of absence category used to identify the post-production burning of chert artifacts. The thermal alterations found on chert artifacts at Blackman Eddy were not associated with pre-production heat treatment of raw chert. Heat treatment of chert involves the slow heating and cooling of raw materials prior to the production process, allowing them to be flaked more easily while maintaining the integrity of the raw material. The presence of potlids, irregular cracks, and discolorization on a high number of chipped stone artifacts suggests that these artifacts were burned as part of trash middens before they were deposited as fill in the different construction phases of Str. B1.

Thermal alteration can be identified based on several characteristics. First, thermally-altered chert artifacts have altered colors, usually red or black. Second, burned chert artifacts have a high number of potlid fractures present on their dorsal and ventral surfaces. Potlids are round flakes that break off the stone's surface from heating and then

quick exposure to cooler temperatures after heating. Potlids look similar to flakes, but they lack platforms or bulbs of force (Whittaker 1994:73). Third, thermal alteration creates irregular cracks and breaks found away from the platform edge. These cracks and breaks are referred to as crazing. All of these characteristics of thermal alteration were found on a large number of chert chunks and flake fragments sampled from Structure B1.

Discussion

The purpose of this chapter was to outline the assumptions and methods used to excavate and examine the chipped stone artifacts of Blackman Eddy. All of the attributes coded in this study were selected to examine the two components of an industry: the raw materials used in production and the manufacturing techniques of production. Use-wear and thermal alteration were also studied to determine what tools were used for and how they were treated after their utility expired.

To study these three aspects of chipped stone tools, nine attributes were selected and coded for each artifact examined. The presence or absence of these attributes in the chipped stone tools selected from the different building episodes of Str. B1 of Blackman Eddy are indicators of certain raw materials and production techniques. Differences in these artifact attributes between the different construction episodes of Str. B1 represent changes in the various chipped stone tool industries of Blackman Eddy over time. If these changes in artifact attributes are significant, and if they correlate with the social changes mentioned in Chapter 1, then the null hypothesis of this study would be false. If there are no significant changes in artifact attributes over time, then the null hypothesis of this thesis would be supported. The next chapter examines the data collected on the artifacts

from the chipped stone tool industries of Blackman Eddy based on the artifacts sampled from Str. B1.

Chapter 3- Results and Interpretations of the Chipped-stone Tool Industries of Blackman Eddy

The purpose of my thesis is to look at correlations between social changes and changes in the chipped stone tool industries of Blackman Eddy. My hypothesis is that the development/introduction of social changes at Blackman Eddy (as indicated by changes in architectural forms and styles) caused economic change in the various chipped stone tool industries (as reflected by change in the chipped stone artifacts). Therefore, I looked at changes in the attributes associated with the exchange, production, and function of chipped stone artifacts. The artifacts in this study were selected from fill associated with the seven construction episodes of Str. B1, and they were analyzed individually for the attributes discussed in Chapter 2. Each construction episode represents a temporal phase in the history of Blackman Eddy. The artifacts analyzed from the fill of each construction episode represent contemporary deposits of chipped stone materials. Change in artifact attributes from episode to episode represents change over time. First, I will discuss change in exchange patterns based on the raw material attributes. Second, I will look at the data on chipped stone tool production. Finally, I will examine the data on artifact function.

Raw Material Exchange

The attributes selected to study the exchange of raw materials were raw material type, color, translucence, and patination. These attributes were selected to examine what types of raw materials were used in the production of chipped stone tools and to infer

Raw Material	Obsidian	Chert	Quartz	Quartzite	Total
Episode 1	2	1277	21	8	1308
Episode 2	0	291	9	2	302
Episode 3	0	244	2	3	249
Episode 4	2	350	1	3	356
Episode 5	8	265	1	1	275
Episode 6	0	111	2	2	115
Episode 7	37	200	1	2	240
Total	49	2738	37	21	2845

Table 4. Raw Material Numbers per Construction Episode.

what types of raw materials were brought into Blackman Eddy through regional exchange. The four main raw material types used in the production of chipped stone tools at Blackman Eddy were obsidian, chert, quartz, and quartzite. Of all four raw material types, only quartzite and chert were found in each of the seven construction episodes (Table 4). The presence of chert and quartzite in deposits from each construction episode may indicate their consistent use as raw material source for chipped stone tools (chert) and as instruments used in the production of chipped stone tools (quartzite). Quartz artifacts were found in deposits associated with all construction episodes except Construction Episode 4, and it was also predominately used as production instruments in chipped stone tool production. Obsidian artifacts were found in fill associated with Construction Episodes 1, 4, 5, and 7. The sporadic presence of obsidian in the deposits of Str. B1 indicates that it was a rare raw material source at Blackman Eddy that may not have been easy to acquire.

The weighted averages of obsidian, quartz, chert, and quartzite artifacts was variable across the seven construction episodes, but there were a few interesting

observations from the data. To test for change over time, I used chi-square tests for each of the raw material types. There are two slightly different versions of the chi-squared test, though both are the same in principle (Shennan 1997:104). In the 1-sample test, collected data is compared to a theoretical population to see how good the correspondence is between the two distributions. The 1-sample chi-square test uses a set of observations divided into a number of mutually exclusive categories. A comparison is then made between the distribution of observations across the categories and the distribution of anticipated observations under some theoretically derived expectation, specified by the null hypothesis (Shennan 1997:106). The mutually exclusive categories in this study are the seven construction episodes. The theoretical expectation is the null hypothesis of this thesis:

H_0 : there are no significant changes in artifact attributes across the seven construction episodes.

H_1 : There are significant changes in artifact attributes across the seven construction episodes.

If there was no change in artifact attributes across the seven construction episodes, then the expected percentage of that attribute should be the same in each construction episode. The expected percentage was found by calculating the overall average of each attribute based on the observed data. A table of expected values was then created using the expected percentage and the total number of observed values. With the expected values and observed values in hand, I could compare the observed values with the expected values using the chi-square formula to see whether the difference between the observed and expected values was significant enough to reject the null hypothesis.

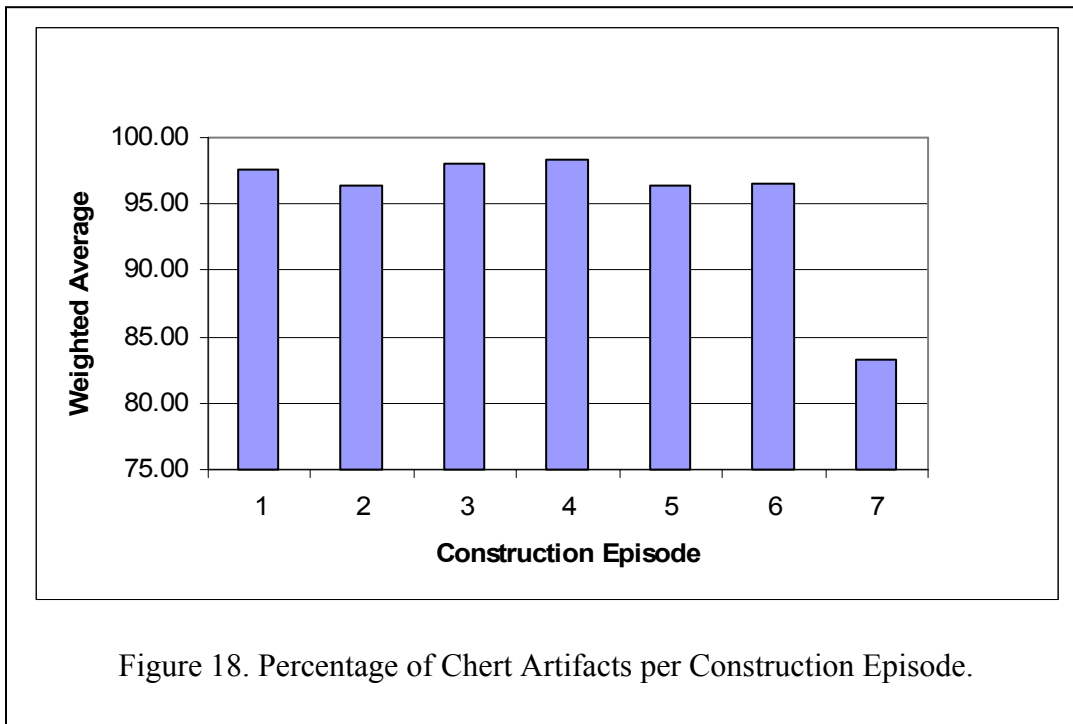
The calculated chi-square values were compared to a table of tabulated chi-square values at a 95 percent significance level ($\alpha = 0.05$), and six degrees of freedom ($V = 6$). The tabulated chi-square value at these parameters is 12.5916. Therefore:

If $X^2_{calc} \geq 12.5916$, then reject H_0

If $X^2_{calc} < 12.5916$, then accept H_0

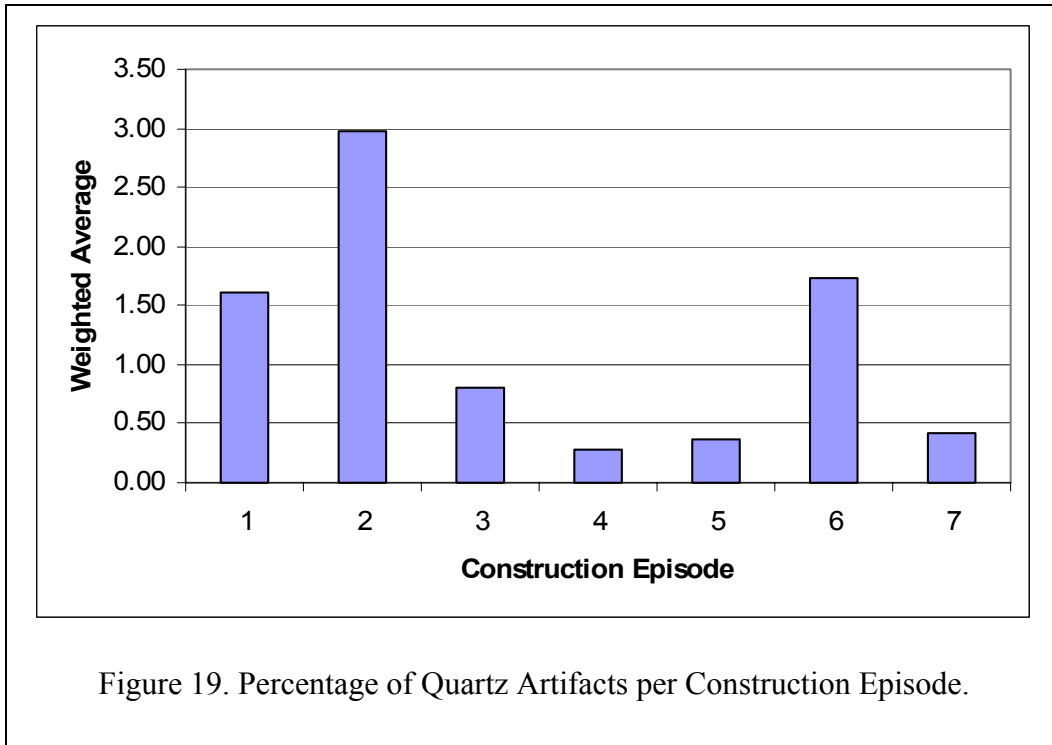
The chi-square values for the four raw material types were mixed in their support or rejection of the null hypothesis. The calculated chi-square values for quartz and obsidian artifacts exceeded the expected value, therefore rejecting the null hypothesis. The calculated chi-square value for the percentage of obsidian was 296.53 and the chi-square value for quartz was 14.27. However, the chi-square values from chert and quartzite were less than the expected value, so I accepted the null hypothesis. However, the overall number of obsidian and quartzite artifacts was very low, and the chi-square value for these variables may be due to low sample size. These values were 4.26 and 3.21 respectively. This means that obsidian and quartz distributions changed significantly over time while chert and quartzite distributions did not.

The lack of change in chert percentages is significant because it may indicate that social change had little impact on the use of chert in chipped stone tool production over time. This is important because chert was the most widely-used raw material for the production of chipped stone tools at Blackman Eddy. The weighted average for chert chipped stone tools was consistently higher than the weighted averages of all other raw material types in each of the seven construction episodes. Between 83- 97 percent of all chipped stone artifacts found in deposits from the seven construction episodes were made of chert (Figure 18).

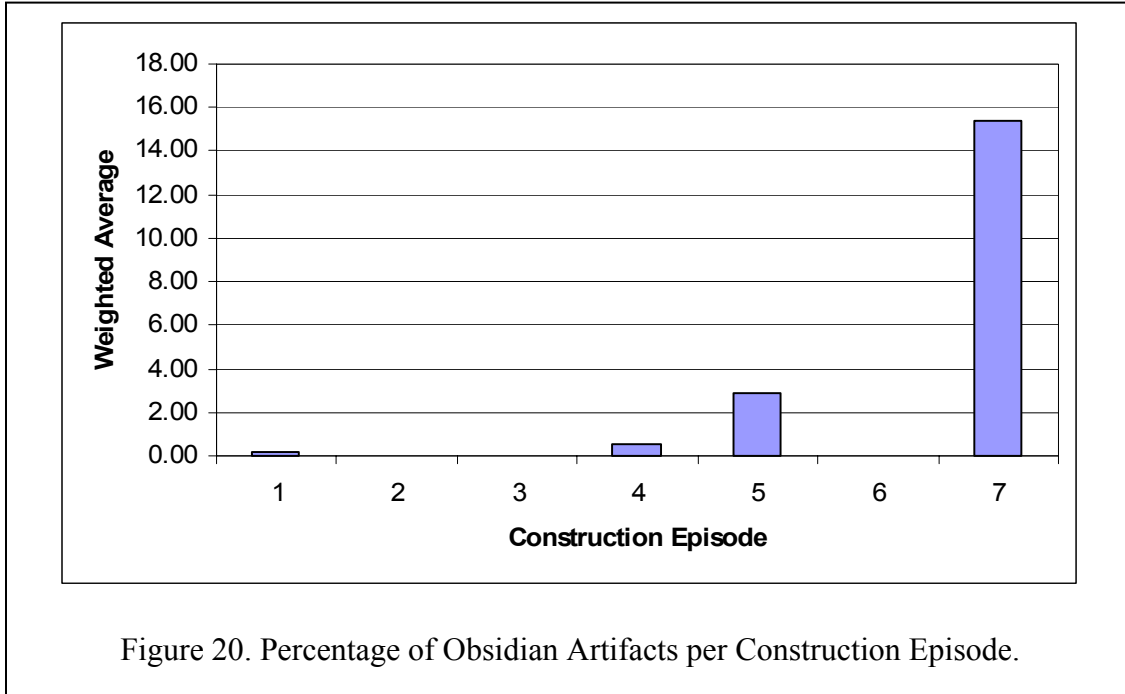


The change in the percentage of quartz and obsidian artifacts over time may have been caused by social change at Blackman Eddy. The weighted average of quartz appears to have decreased over time (Figure 19). One explanation for the decrease in quartz percentages may be due a shift in the use of quartz from a ritual function. The higher frequency of quartz associated with the early buildings of Str. B1 may have been part of a ritual paraphernalia and perhaps may have been used as divining stones (Brown 2003:105). Interesting, the percentage of quartz artifacts decreases as the percentage of obsidian increases over time.

The percentage of obsidian in the earliest construction episodes is quite low, and in many cases, non-existent. However, during and later part of the Middle Preclassic, the percentage of obsidian artifacts increased. This may be associated with social changes



that occurred at the end of Construction Episode 2. During the final construction episode, a significant increase in percentage of obsidian artifacts was found, as the percentage of obsidian artifacts increased from around 3 percent or less to 15.42 percent of all chipped stone artifacts (Figure 20). Because there are no known obsidian sources in Belize, all obsidian was brought into this area through some type of regional exchange. The dramatic increase in the percentage of obsidian artifacts indicates that this raw material became more accessible to the individuals at Blackman Eddy during the Classic period. The change in the percentage of obsidian artifacts from deposits associated with Construction Episode 7 corresponds to social changes that occurred at Blackman Eddy between the Late Preclassic and Classic periods and may have been a direct result of it.



The analysis of the raw materials types at Blackman Eddy only provides information on what types of materials were used in the production of chipped stone tools. With the exception of obsidian, the analysis of raw material sources did not provide definitive information on the provenience of these materials. This information, which is needed to infer raw material exchange, came from the data on the other raw material attributes of this study.

Another raw material attribute used in this study is artifact color. Some raw material types have unique physical compositions that are caused by specific geographic conditions of a region. This physical variability may be expressed visually by differences in raw material color. Therefore, color often can be used as a way to infer the provenience of certain raw materials if the source location of the raw material is known. Several different colors were found for artifacts from the various deposits of Str. B1. The

different color attributes in this study were: caramel, chocolate, tan, tan-white, white, gray, gray-white, black, green, clear and red. Most of the colors (caramel, chocolate, tan, tan-white, white, gray, and gray-white) were colors associated with chert, while green, white, black, and clear colors were associated with obsidian, quartz, and quartzite.

Color

Chert artifacts from each of the seven construction episode deposits had a variety of different colors. All eight major colors associated with chert were found in each construction episode (Table 5). A wide variety of different chert sources were used to manufacture chert chipped stone artifacts at Blackman Eddy across its history. Caramel-colored chert appears to be the most widely used chert type in each of the seven construction episodes, averaging between 27 and 45 percent of all chert artifacts. Chi-square tests for the chert color types were mixed in their support of the null hypothesis.

Chi-square values for caramel, chocolate, gray, tan-white, and black were less than the expected value and appear to have changed very little across the various construction episodes. The calculated values for these colors were: caramel = 11.54; chocolate = 11.3; gray = 11.4; tan-white = 11.16; and black = 4.78. The calculated chi-square values for gray-white, white and tan indicate that these color types did change significantly over time. The calculated chi-square values for these colors were: gray-white = 19.74; white = 32.23; and tan = 37.94. However, the weighted averages for these colors are variable over time, and they did not correlate well to any of the periods of social change at Blackman Eddy. Though these changes were statistically significant, their variability indicates a true random pattern that does not support that these colors were affected by social change, and it appears that social change at Blackman Eddy had

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black	Total
Episode 1	417	120	110	299	79	11	1	239	1	1277
Episode 2	91	21	17	98	22	6	1	35	0	291
Episode 3	72	24	19	61	13	10	6	39	0	244
Episode 4	120	42	25	48	34	17	14	50	0	350
Episode 5	80	18	21	38	31	14	6	56	1	265
Episode 6	37	10	5	16	12	5	4	22	0	111
Episode 7	91	10	9	37	9	6	2	36	0	200
Total	908	245	206	597	200	69	34	477	2	2738

Table 5. Chert Colors per Construction Episode.

little effect on the type of chert used to produce chipped stone tools. Furthermore, the data on chert artifact color does not bring any additional insight into the provenience of the different chert sources used at Blackman Eddy for chipped stone tool production. If the color of chert artifacts from Blackman Eddy is similar to the color of chert samples from the Belize River Valley, then it is likely that local chert sources were used to produce chert tools. The analysis of chert artifact translucence produced a similar result and conclusion.

All of the quartzite artifacts observed in this study were white in color. White is also a most common color for quartzite found in the Belize River Valley, and it is likely that all of the quartzite found at in the fill from the seven construction episodes of Str. B1 at Blackman Eddy was locally procured. The two quartz colors observed for the artifacts from Str. B1 were clear and white. Both of these colors are common for quartz artifacts in Belize River Valley, and it also seems likely that quartz artifacts at Blackman Eddy were locally procured. Interestingly, white-colored quartz appears to replace clear quartz over Eddy, then it would have been sought out and procured. As rituals changed over time,

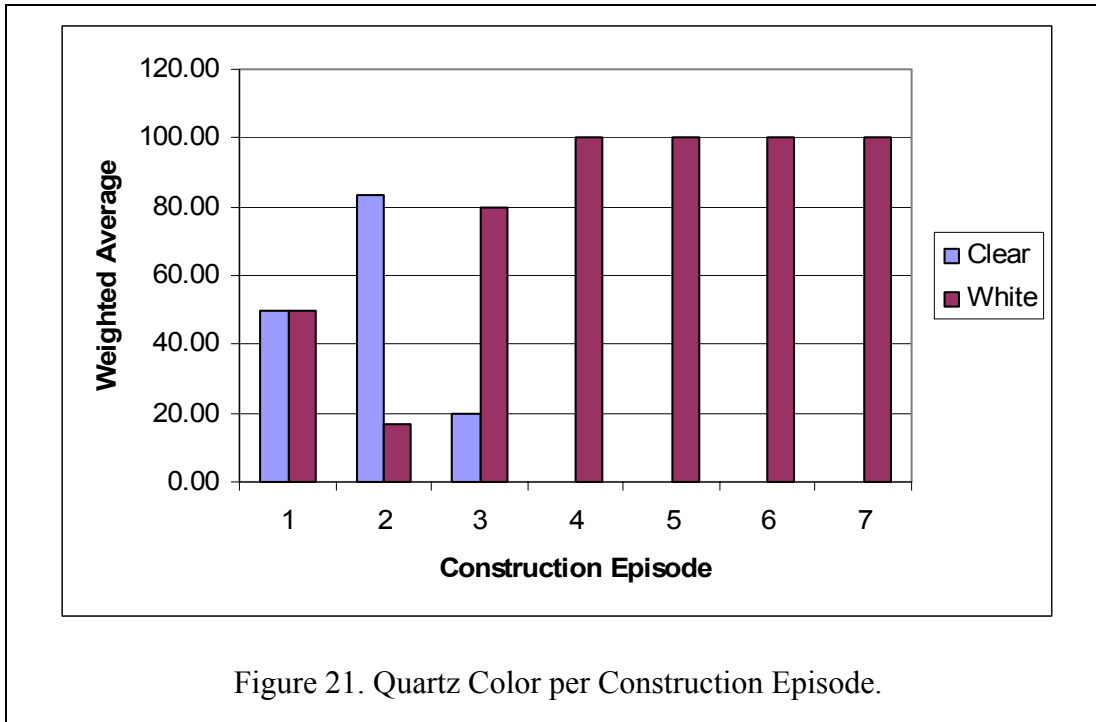


Figure 21. Quartz Color per Construction Episode.

time (Figure 21). This change over time in quartz color, just after social changes associated with Construction Episode 3. The change in quartz color may be related to the shift in ritual importance of quartz. If clear quartz was used in early rituals at Blackman clear quartz percentages declined in subsequent structures as quartz became less important in ritual life at Blackman Eddy.

The two colors observed for obsidian artifacts were green and black. The majority of obsidian artifacts (N = 35) from the seven construction episode deposits were identified as black in color. The only change in color occurred during the last construction episode with the introduction of two green obsidian artifacts. Further visual analysis of the black-colored obsidian artifacts by Fred Nelson and John Clark indicated that the black obsidian artifacts from Blackman Eddy actually came from two different obsidian sources. The black obsidian artifacts from fill associated with Construction Episodes 1, 4, and 5 was visually identified as obsidian from the San Martin Jilotepeque

(SMJ) source in highland Guatemala. The Black obsidian from fill associated with Construction Episode 7 was identified by the as El Chayal obsidian also from highland Guatemala. The two green-colored obsidian artifacts were identified by the same analysts as obsidian from the Pachuca obsidian source in Hidalgo, Mexico. Based on the data from Blackman Eddy, obsidian exchanged into Blackman Eddy during the Middle Preclassic period came from the SMJ source. By the Classic period, most obsidian was exchanged into Blackman Eddy came from the El Chayal source in Guatemala, supplemented by a small amount of obsidian from Mexico.

Several models have been presented for obsidian exchange in Belize. In the first model, obsidian from the Early Classic, Late Classic, and Terminal Classic period deposits at Nohmul were analyzed for their provenience using neutron activation analysis (Hammond et al. 1984:818). The data from Nohmul was compared to similar data collected from various obsidian sources across Mesoamerica. Most of the obsidian from the Early Classic period at Nohmul was identified as obsidian from the El Chayal source (Hammond et al. 1984:818). During the Late Classic and Terminal Classic periods, the majority of the obsidian at Nohmul came from the Ixtepeque source in highland Guatemala (Hammond et al. 1984:818).

Based on these findings and similar findings at Cuello, a model for obsidian exchange routes was formulated. This model proposed that two separate routes, one for El Chayal and one for Ixtepeque, were used to transport obsidian from the Guatemalan highlands into the lowland areas. The former was an overland route used to transport El Chayal obsidian from its source in the highlands down the Pasion River, through Tikal, and across the Rio Hondo into Belize during the Early Classic period (Hammond et al.

1984:818). By the Late Classic period, a second coastal route was used more frequently to transport obsidian from the Ixtepeque source, down the Montagua or Rio Dulce, and up the coast to the Yucatan Peninsula, with secondary routes running upstream the Hondo River from the Chetumal Bay in Belize (Hammond et al. 1984:818).

Further trace element analysis of obsidian artifacts from other sites in the eastern, central, and western lowland regions indicated that obsidian exchange was more complicated than the two-source, two-pronged model (Healy et al. 1984:225). First, El Chayal obsidian was found in several coastal and island sites in Belize, suggesting that some obsidian from the El Chayal source was moved along the coast (Healy et al. 1984:225). Also, trace element analysis of obsidian from Middle and Late Preclassic deposits in Belize indicated that SMJ obsidian was exchanged in significant quantities during the Preclassic (Brown et al. 2004:227; McSwain 1991:194). SMJ obsidian appears to be the dominant obsidian source utilized by most lowland areas during the Middle Preclassic, as demonstrated by the high percentage of SMJ obsidian found in Preclassic deposits at Tikal, the Peten lakes areas, and the Belize River Valley (Ford et al. 1994; Moholy-Nagy and Nelson 1990; Nelson et al. 1978; Rice 1984).

During the Late Preclassic, a shift from SMJ obsidian to El Chayal obsidian occurred at most lowland sites, including Blackman Eddy. This may have been the result of the rise of Kaminaljuyu as a major ceremonial center and the decline of the Olmec on the Pacific coast (Nelson and Clark 1998:289). These events led to an increase in the supply of El Chayal obsidian in the lowland areas. El Chayal began to replace SMJ obsidian in most of the eastern lowland sites during the Late Preclassic, and it came to be

the dominate source of obsidian used in the eastern lowland regions by the Early Classic period (Nelson and Clark 1998:292).

The presence of green obsidian at Blackman Eddy suggests that Pachuca obsidian controlled by Teotihuacán was exchanged into the eastern lowlands during the Classic periods. The Classic period was a time of major political and economic expansion for Teotihuacan and included the production of significant quantities of green obsidian tools and products used in regional exchange (Sanders and Santley 1984). In addition to the work at Blackman Eddy, archaeological work at other sites in the eastern lowlands has also recovered green obsidian from Mexico. At the site of Altun Ha, a large cache containing 245 green chipped-stone “eccentrics” and 13 large bifacially-flaked stemmed blades was found in an early Classic period tomb within Structure F-8 (Pendergast 1971:456).

The obsidian data from Blackman Eddy support Nelson and Clark’s model of obsidian exchange for the eastern Maya lowlands. However, this model should be used as a general view of obsidian exchange for the region and does not represent all of the ways obsidian was likely exchanged across time and space from the various sources in Guatemala and Mexico. The obsidian data from other sites in Belize indicate that a wide variety of sources was used at different times. This may have been an intentional strategy on the part of individuals living in the eastern lowland areas used to ensure supply by using a diverse set of sources and exchange routes.

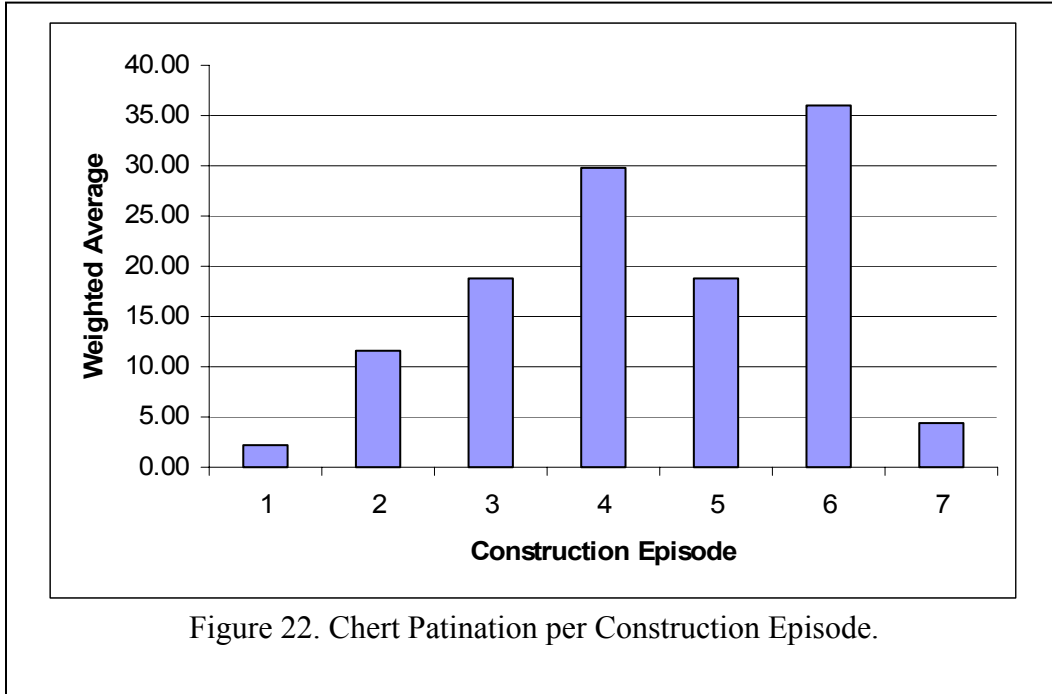
Translucence	Present	Absent	Total
Episode 1	849	428	1277
Episode 2	194	97	291
Episode 3	135	109	244
Episode 4	196	154	350
Episode 5	122	143	265
Episode 6	61	50	111
Episode 7	117	83	200
Total	1674	1064	2738

Table 6. Chert Translucence per Construction Episode.

Translucence

Another raw material attribute used in this study is translucence. This was a presence/absence category used predominately for chert artifacts. Because chert clarity may be an indication of particular chert sources, changes in the percentage of translucent chert artifacts in seven construction episodes deposits may be indicative of change in the exchange of chert over time. The weighted average for translucent artifacts from each construction episode was variable, but there were no discernable trend over time for the use of translucent chert in chipped stone tool production (Table 6). Chi-square values for chert translucence were higher than the expected value ($X^2_{calc} = 28.13$), so the variability across the seven construction episodes was significant. However, the change in percentage over time does not correlate to social change. Like chert color, no conclusions can be made in regards to the regional exchange of chert based on translucence.

However, I believe that most of the translucent chert artifacts examined in this study were not brought into the site through regional exchange. In the analysis of chert nodules collected from Blackman Eddy, most samples examined were translucent,



indicating that translucent chert was locally available (Chapter 2). If translucent chert can be procured locally, then it is likely that most of the translucent chert artifacts sampled from Str. B1 were produced using local sources.

Patination

The final chert raw material attribute examined in this study was patination. Patination was a presence or absence category for chert artifacts. Because chert from distinct sources weather at different rates, the presence of patina on chert may indicate different chert sources and regional chert exchange. The weighted average of chert artifacts with patina from deposits in each of the seven construction episode increased over time until the final construction episode (Figure 22). Chi-square tests for chert patination indicated that the change in patination percentage over time was very

significant ($X^2_{calc} = 247.63$). Clearly, the change in patination percentage over time was not due to random sampling alone. If patinated chert were regionally exchanged into Blackman Eddy, then the percentage of chert exchanged increased over time until it declined during the Classic period. However, the pattern for chert patina found at Blackman Eddy may be caused by rise of Colha as a major production center of chert artifacts rather than social change at Blackman Eddy.

First, patina was found on more chert samples from Colha than any other region. This means that the chert from sources in the northern region likely weather at faster rate than sources from other regions. Second, the trend for patinated-chert artifacts at Blackman Eddy correlates with the expansion of the Colha chert industries. Chert tools were produced at Colha during the Middle Preclassic period, with large-scale workshop production beginning during the Late Preclassic period (Hester 1985:197). Chert artifacts from these Late Preclassic workshops have been found in many different sites across much of northern Belize, including Pultrozer Swamp, Cuello, and Cerros (Hester 1985; McAnay 2001; McSwain 1991; Lewenstein 1994). This indicates that there was a broad exchange network for chert tools produced at Colha in the north and opens the possibility for exchange network in the south. A significant increase in the percentage of patinated chert artifacts over time, with a dramatic increase in patinated chert in the Late Preclassic period deposits of Str. B1, may be signs of that exchange network.

The drop in the percentage of patinated chert during the Classic period can also be explained by events at Colha. Based on ceramic evidence, there may have been a hiatus in chert tool production of as much as 300 years at Colha during the Early Classic period (Shafer and Hester 1983:529). If there was a decline in production, there may have also

been a decline in the exchange of chert from Colha. During the Classic period at Blackman Eddy, the percentage of patinated chert artifacts dropped from 35.48 percent of all chert artifacts to 3.73 percent. This drop in patinated chert by nearly 32 percent may have been caused by the changes in chert production at Colha.

Based on the analysis of attributes associated with raw material exchange, it is clear that all of the obsidian artifacts at Blackman Eddy were made from materials that were brought into the region. While the change from the use of SMJ to El Chayal obsidian may be due to factors other than social change at Blackman Eddy, the increase in the percentage of obsidian artifacts found in deposits associated with Construction Episode 7 could have been a direct result of social changes that occurred between the Late Preclassic and Early Classic periods. Analysis of the raw material attributes for quartz and quartzite indicate that both of these raw materials were likely procured from local materials not brought into Blackman Eddy through regional exchange, but the change in quartz color and percentage after the third construction episode may have resulted from social change. There were no significant changes in quartzite that correspond to social changes at Blackman Eddy.

The evidence for the regional exchange of chert is mixed. While artifact color was an important analytical attribute for obsidian, quartz, and quartzite, it had very little analytical importance for chert. While there were some significant variations in several chert colors and chert translucence over time, there were no detectable trends in that correspond to social change at Blackman Eddy. Furthermore, the proveniences of chert artifacts could not be determined by color or translucence. Since most of the chert artifacts were visually similar to collected samples from the Belize River Valley, it seems

likely that most of the chert used to produce the chert artifacts from Str. B1 at Blackman Eddy was procured from local sources in the Belize River Valley.

The presence of a significant amount of chert artifacts with patina indicates that local supplies of chert may have been augmented through the regional exchange of chert from sources near the site Colha. Chi-square tests indicated that variation in patina percentages between the seven construction episodes was very significant. While the increasing percentage of patinated chert per construction episode corresponds to social change over time at Blackman Eddy, it is also possible that these changes were caused by events at the site of Colha. In the next section, I will examine the production of chipped stone tools at Blackman Eddy for what types of tools were likely produced at Blackman Eddy, how production may have changed over time and possible correlations between production change and social change.

Chipped Stone Tool Production

Four production attributes were selected to examine the production of chipped stone artifacts from Str. B1 at Blackman Eddy. These attributes were: technological type, cortex, weight, and artifact size. The first attribute I will discuss is technological type. Technological types are part of a classification system that organizes artifacts according to how and when they were made in the manufacturing sequence. The presence of certain technological types at a site can be used to infer whether or not particular manufacturing sequences and procedures may have taken place locally. There are four chipped stone tool industries at Blackman Eddy. These are the chert flake industry, obsidian flake, chert

Technological Types	Flakes	Flake Fragments	Cores	Chunks	Fortuitous Blades	Bifaces	Bifacial Thinning Flakes	Adzes	Sum
Episode 1	534	692	14	22	15	0	0	0	1277
Episode 2	99	152	24	10	2	2	2	0	291
Episode 3	105	116	5	16	2	0	0	0	244
Episode 4	186	142	6	13	0	2	1	0	350
Episode 5	114	141	4	5	1	0	0	0	265
Episode 6	53	44	2	10	2	0	0	0	111
Episode 7	79	104	4	5	1	6	0	1	200
	1170	1391	59	81	23	10	3	1	2738

Table 7. Chert Technological Types per Construction Episode.

biface, and obsidian prismatic blade industries. The different technological types of each industry were discussed in Chapter 2.

Chert and Obsidian Flake Industries

Based on the percentage of chert artifacts found in Str. B1, the chert flake industry was the largest chipped stone tool industry at Blackman Eddy. This was a simple and unspecialized industry characterized by the production of flake tools from chert cores using direct percussion. The main technological types associated with the chert flake industry are: flakes, chunks, flake fragments, and fortuitous blades. These technological types were found in fill associated with each of the seven construction episodes of Str. B1 (Table 7). The presence of each technological type associated with chert flake production in fill from each construction episode indicates that chert chipped stone tools were likely produced at Blackman Eddy throughout its history in a manner similar to that described

Technological Types	Flakes	Flake Fragments	Cores	Chunks	Fortuitous Blades	Bifaces	Bifacial Thinning Flakes	Adzes
Episode 1	41.82	54.19	1.10	1.72	1.17	0.00	0.00	0.00
Episode 2	34.02	52.23	8.25	3.44	0.69	0.69	0.69	0.00
Episode 3	43.03	47.54	2.05	6.56	0.82	0.00	0.00	0.00
Episode 4	53.14	40.57	1.71	3.71	0.00	0.57	0.29	0.00
Episode 5	43.02	53.21	1.51	1.89	0.38	0.00	0.00	0.00
Episode 6	47.75	39.64	1.80	9.01	1.80	0.00	0.00	0.00
Episode 7	39.50	52.00	2.00	2.50	0.50	3.00	0.00	0.01

Table 8. Percentage of Chert Artifacts per Construction Episode.

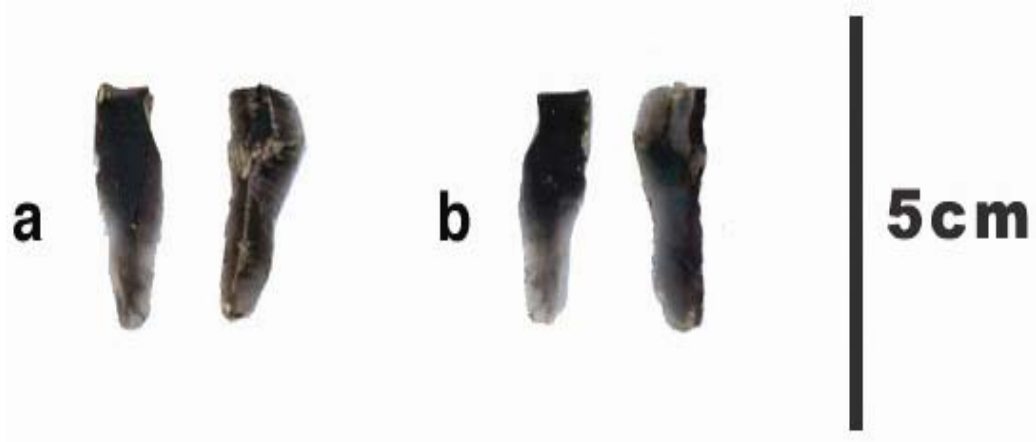


Figure 23. Dorsal (a) and Ventral (b) View of Obsidian Flakes.

over time (Table 8). While there was some change over time in chert flake production, it was not likely affected by social change.

The obsidian flake industry was also a simple unspecialized industry that used the same productive techniques as the chert flake industry, and it had the same technological types. However, analysis of the various obsidian flake artifacts from Blackman Eddy clearly indicated that these tools were not likely produced at Blackman Eddy. Only six obsidian flakes and obsidian flake fragments were found in Str. B1. Interestingly, two obsidian flake fragments were found in fill associated with the first construction episode. These flake fragments had an average length of 18.88 mm, an average width of 13.04 mm, and an average thickness of 2.05 mm. Both of these obsidian flakes were relatively short. The weight of these flakes could not be detected by the scale, so the weight was estimated to be 0.05 grams for each flake. One of the obsidian flakes lacked its proximal end, so it could not be determined if it was produced by percussion or pressure. However, the other flake did have its proximal end and the bulb of percussion on the ventral side suggests that it was produced by direct percussion (Figure 23). This is an important find because it is similar the data on blade production from Cahal Pech.

Excavations at Cahal Pech have recovered obsidian percussion blades with similar shapes, contexts, and radio-carbon dates as the early flakes from Blackman Eddy (Awe and Healy 1994:194; Garber et al. 2001:44). Archaeologists examining the obsidian artifacts at Cahal Pech concluded that they were produced by percussion and not pressure flaking (Awe and Healy 1994:197). The other four obsidian flakes were found in deposits associated with Construction Episode 7. These flakes were all intact and had an

average length of 26.07 mm, and average width of 21.33 mm, and an average thickness of 5.96 mm. The average weight of the obsidian flakes was 4 g.

Chert Biface Industry

The third chipped stone tool industry at Blackman Eddy is the chert biface industry. This industry is more complicated than either the chert or obsidian flake tool industries, and it requires a higher level of skill to effectively manufacture tools. Biface production uses both percussion and pressure techniques, and it is extremely easy to break the biface in the latter stages of production. These factors may have limited the production of bifaces to individuals who had significant experience manufacturing them. The technological types associated with the chert biface industry are: bifaces, bifacial thinning flakes, chunks, flakes and macro-flakes. One of the problems in analyzing the chert biface industry is that many of the technological types (flakes, macro-flakes, and chunks) overlap with the chert biface industry. Though the presence of these types may indicate biface production, the most important technological types that indicate local production are bifacial thinning flakes.

During the survey work of 2003, chert bifacial thinning flakes were found in significant numbers at Colha and El Pilar. Both of these sites were the location of significant chert biface production (Hester 1985; Ford and Olsen 1989). Based on this evidence, there should be a large number of chert bifacial thinning flakes at Blackman Eddy if bifaces were produced at the site. At Blackman Eddy, only three bifacial thinning flakes were found among artifacts sampled from Str. B1. This low number of bifacial thinning flakes for the entire sample of chert chipped stone artifacts strongly indicates

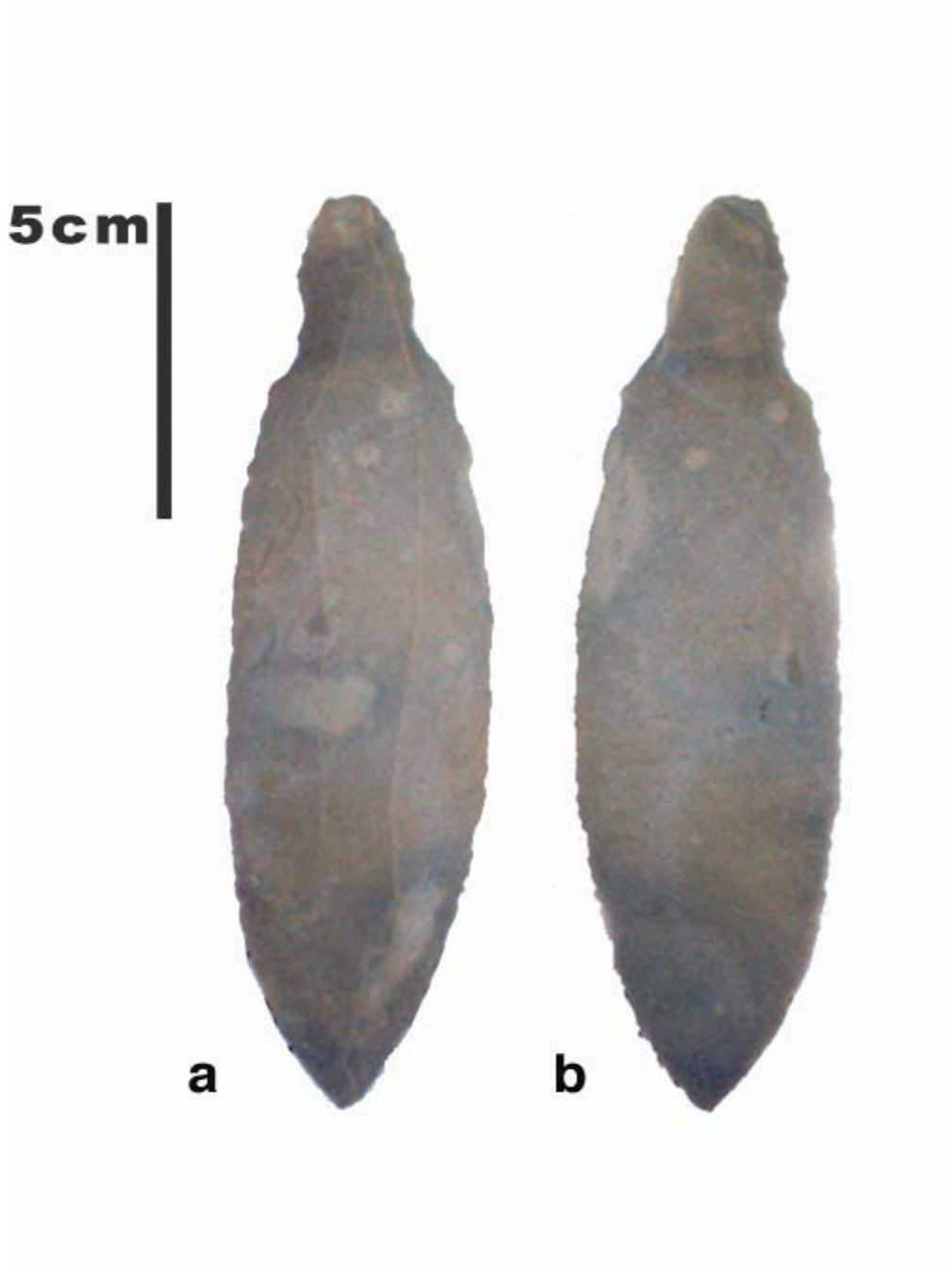


Figure 24. Dorsal (a) and Ventral View of Chert Macro-flake from Str. B1.

that chert biface production was not a common production process at Blackman Eddy.

If bifaces were produced at Blackman Eddy, then it is likely that this industry was restricted to a specific area at the site, and/or that the bifacial thinning flakes were not recycled as construction fill for Str. B1. Another possibility is that biface production at Blackman Eddy may have been a type of specialized production, and, in this case, would have been directly affected by social change at Blackman Eddy. However, the notion of specialization is highly speculative until more evidence from the site can be produced. The lack of more artifacts associated with biface production at Blackman Eddy makes it difficult conclusively discern any change in the production of chert bifaces over time, though it is most likely that that social change at Blackman Eddy does not appear to have facilitated the local production of chert bifaces.

Ten bifaces from Blackman Eddy were examined as part of this study. These bifaces were found in the second, fourth, and seventh construction episode fills. These ten bifaces had an average length of 84.16 mm, of 48.71 mm, and thickness of 30.14 mm. The average weight of these artifacts was 116.11 g. Most of the bifaces found in Str. B1 were large, thick, and covered with cortex, giving these bifaces an unfinished appearance. There were a few artifacts from Blackman Eddy that appear to have been finely-made. One of these artifacts is a single chert macro-blade found in the same cache as the two obsidian blades from Construction Episode 7. The macro-blade is long, flat, and tapers from the distal tip to the top of the base (Figure 24). It measured 146 mm long, 38 mm wide, and 9.1 mm in thickness. A large negative flake scar runs along most of the dorsal face, indicating that a flake was likely removed from the blade before it was shaped into

its final form. Also, the stem of the macro-blade was the location for the blade's bulb of percussion and represents the artifact's proximal end.

There were no flake scars on the ventral side of the blade except at the stem, and there were only a handful of bifacial thinning scars on the dorsal side. This indicates that the macro-blade was not extensively shaped by bifacial flaking and was most likely given its shape through direct percussion while holding the blade at or near 90 degree angle. The macro-blade was chipped on both the left and right sides, and extensive chipping at the proximal end of it on both the dorsal and ventral faces created the stem of the blade. The macro-blade was manufactured by a productive technology used extensively found at Colha in the Middle and Late Preclassic periods, and it may be evidence for the exchange of chert tools between Colha and Blackman Eddy. If so, the macro-blade found at Blackman Eddy suggests that Colha chert exchange networks may have been established before chert tools were mass produced at Colha during the Late Preclassic period.

Obsidian Prismatic Blade Industry

The fourth chipped stone tool industry at Blackman Eddy is the obsidian prismatic blade industry. This was the most complicated chipped stone tool industry examined in this study. The production of obsidian prismatic blades is a multi-step process that requires a high level of technical knowledge and training. The initial stages of production for prismatic blades are similar to those for the simple obsidian flake industry. The products removed in this stage are primarily obsidian flakes, flake fragments, chunks, and obsidian blades. The technological types associated with the latter stages of obsidian

Technological Types	Flakes	Medial Prismatic Blades	Distal Prismatic Blades	Proximal Prismatic Blades	Cores	Chunks	Flake Fragments	Fortuitous Blades	Total
Episode 1	2	0	0	0	0	0	0	0	2
Episode 2	0	0	0	0	0	0	0	0	0
Episode 3	0	0	0	0	0	0	0	0	0
Episode 4	0	2	0	0	0	0	0	0	2
Episode 5	0	3	0	5	0	0	0	0	8
Episode 6	0	0	0	0	0	0	0	0	0
Episode 7	4	22	2	9	0	0	0	0	37
Total	6	27	2	14	0	0	0	0	49

Table 9. Obsidian Technological Types per Construction Episode.

prismatic blade production are: polyhedral cores, prismatic blades, prismatic blade fragments, and exhausted polyhedral cores.

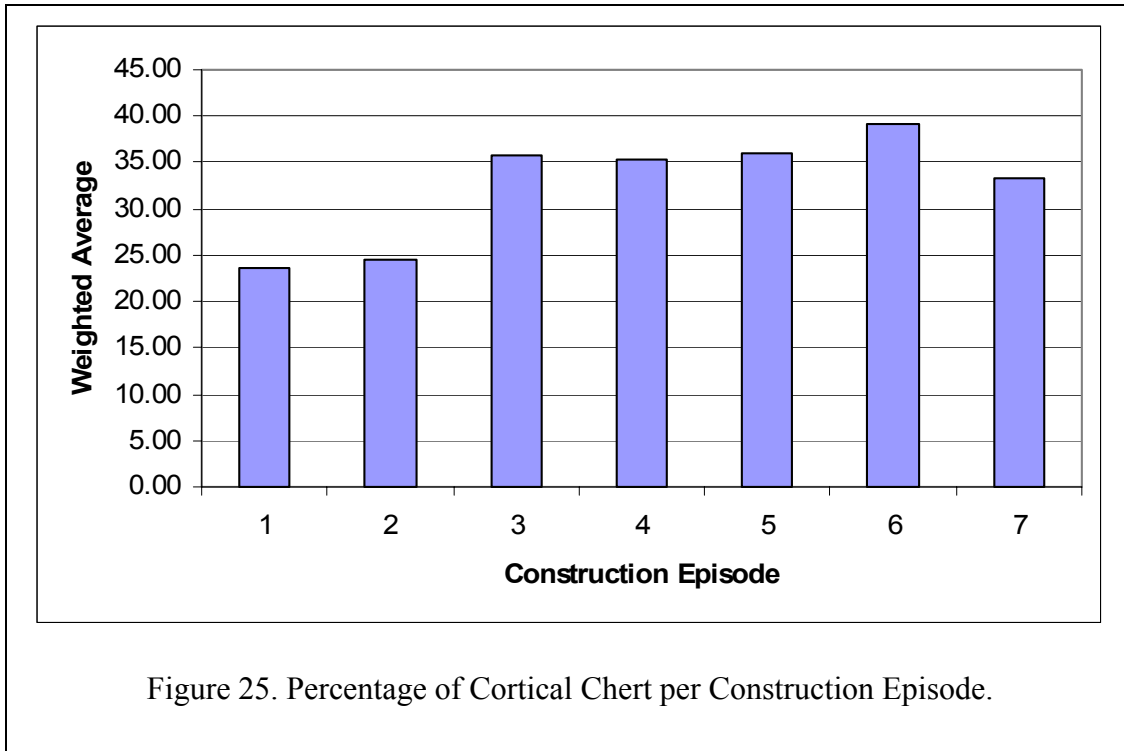
The only technological types associated with the production of obsidian prismatic blades that were found in deposits associated with the seven construction episodes of Str. B1 were proximal, distal, and medial prismatic blade fragments (Table 9). Though each of these fragments was from different segments of obsidian prismatic blades, all of these blade fragments had a similar flat look in profile and prism or trapezoidal shape cross-section. The proximal blade fragments had an average length of 31.2 mm, width of 9.01 mm, and thickness of 2.52 mm. The weight of these blade segments was estimated to be 0.05 g. The medial blade fragments were slightly larger in their dimensions than the proximal blade fragments. The medial blades had an average length of 20.25 mm, width of 9.72 mm, and thickness of 2.56 mm. The average weight for medial prismatic blade fragments was 0.14 g. The distal blade fragments had an average length of 33.36 mm, width of 10.67 mm, and the average thickness was 2.97 mm. These distal blade fragments had an average weight of 0.92 g. The lack of any other technological types strongly indicates that prismatic blade fragments found at Blackman Eddy were not produced at

the site. The obsidian artifacts found in Str. B1 were most likely exchanged into the site as either complete prismatic blades or prismatic blade fragments. Therefore, social change at Blackman Eddy would not have had an impact on the production of obsidian prismatic blades.

Cortex

The second production attribute used in this study was cortex. Cortex is the remains of the outer rind of a nodule selected for chipped stone production. The presence of cortex on an artifact suggests that the artifact was removed from its core early in the production sequence. Therefore, the presence of a large number of artifacts with cortex at a particular site may be an indication of local chipped stone tool production. Cortex was a presence or absence category. Cortex was found on quartz, quartzite, and chert artifacts, but it was not found on obsidian artifacts. The lack of cortex on any obsidian artifacts strengthens the conclusion that these artifacts were not produced at Blackman Eddy.

Cortex was found on both quartz and quartzite artifacts from Str. B1. The high percentage of quartzite artifacts with cortex from fill associated with each construction episodes supports the conclusion that most quartzite artifacts from Str. B1 were hammerstones, hammerstone flakes, or hammerstone flake fragments. Furthermore, cortex on these artifacts had noticeable battering use-wear. This type of use-wear is usually associated with direct percussion. Several quartz and quartzite artifacts were found in fill with hammerstones used in the production of chipped stone tools. The only exception to this are the several quartz flakes found in association with ritual deposits from the first construction episode. For each construction episode, only flakes,



flake fragments, and hammerstones were found for quartz and quartzite artifacts. No quartz and quartzite cores were found in the artifacts sampled from Str. B1. There were no detectable trends over time in weighted averages of quartz and quartzite artifacts with cortex from the seven construction episodes, indicating that social change at Blackman Eddy had little impact on the use of quartz or quartzite.

Cortex was also observed on a significant number of chert artifacts (N = 752). The presence of cortex on 22- 39 percent (roughly one-third) of all chert artifacts from deposits associated with the seven construction episodes does support the conclusion that chert flake tools were likely produced at Blackman Eddy over time (Figure 25). The Chi-square value for the percentage of chert artifacts with cortex exceeded the expected chi-square value ($X^2_{calc} = 365.11$), indicating that the change in cortex percentage over time was significant. The percentage of cortical chert increased over time steadily over time

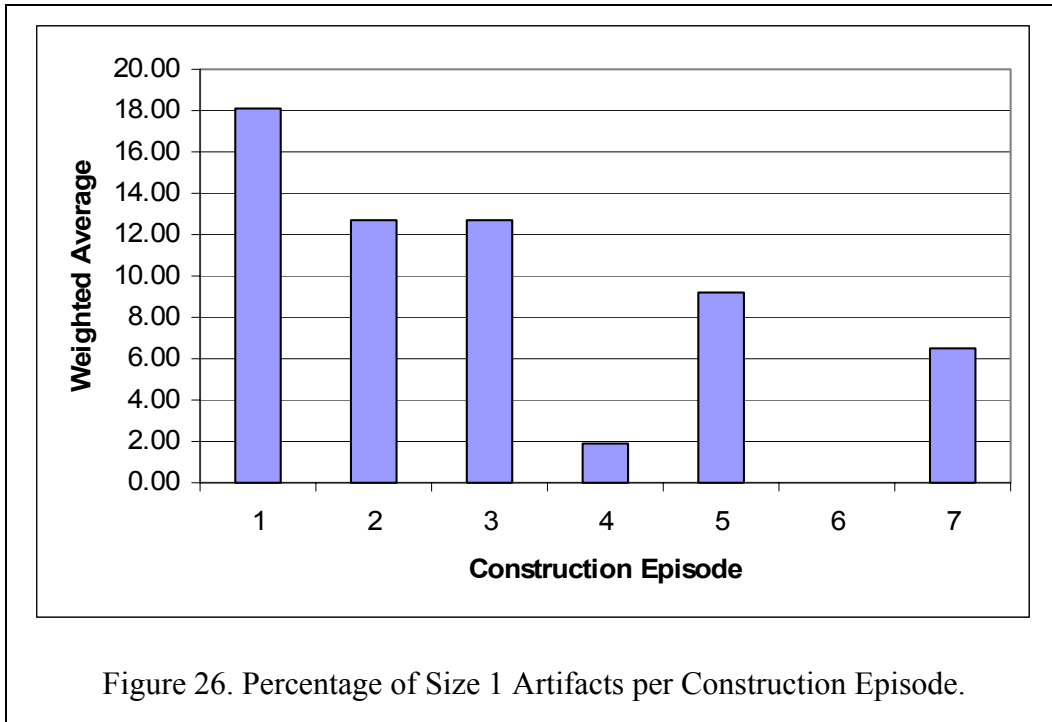
Chert Size	1	2	3	4	Total
Episode 1	231	617	276	153	1277
Episode 2	37	169	58	27	291
Episode 3	30	113	60	33	236
Episode 4	5	116	77	52	250
Episode 5	32	77	62	94	265
Episode 6	0	30	45	36	111
Episode 7	13	129	19	39	200
Total	348	1251	597	434	2630

Table 10. Chert Artifact Size per Construction Episode

until the Classic Despite the increase in artifact size over time, indicating that chert tool production did increase over time. Social change over time may have had some impact on chert chipped stone tool production at Blackman Eddy, but this impact does not appear to have been as strong as expected.

Artifact Size

The third production attribute analyzed in this study is artifact size. The size of chipped stone artifacts is an important analytical attribute because it can aid in determining the size of the core from which an artifact was produced. Because chipped stone production is a reductive process, large cores produce large flakes and small cores produce small flakes. All four size types were documented for chert artifacts from most of the construction episode deposits. The presence of all four size types among the chert artifacts from Str. B1 also suggests that chert artifacts were produced from both large and small chert cores (Table 10). However, the highest percentage of chert artifacts were



either size type 2 or 3, indicating that the majority of chert cores used to produce chipped stone tools were small to medium-sized cores. The estimated size of the cores from Structure B1 is similar to the size of chert cores found in surveys conducted in the Belize River Valley. This line of evidence also suggests that the cores used to produce chert tools at Blackman Eddy were relatively small. Chi-square values for each of the four size types were larger than the expected values, indicating that variation in chert artifact size across the seven construction episodes was significant. However, the percentage of size 2, 3, and 4 artifacts per construction episode was quite random with no discernable trends. Size 1 artifacts did decrease in their percentage per episode over time (Figure 26). This indicates that cores may have been discarded in later periods before their maximum yield was reached. If this was the case, then the disposal of cores before their utility expired indicates that the supply of chert available for tool production may have

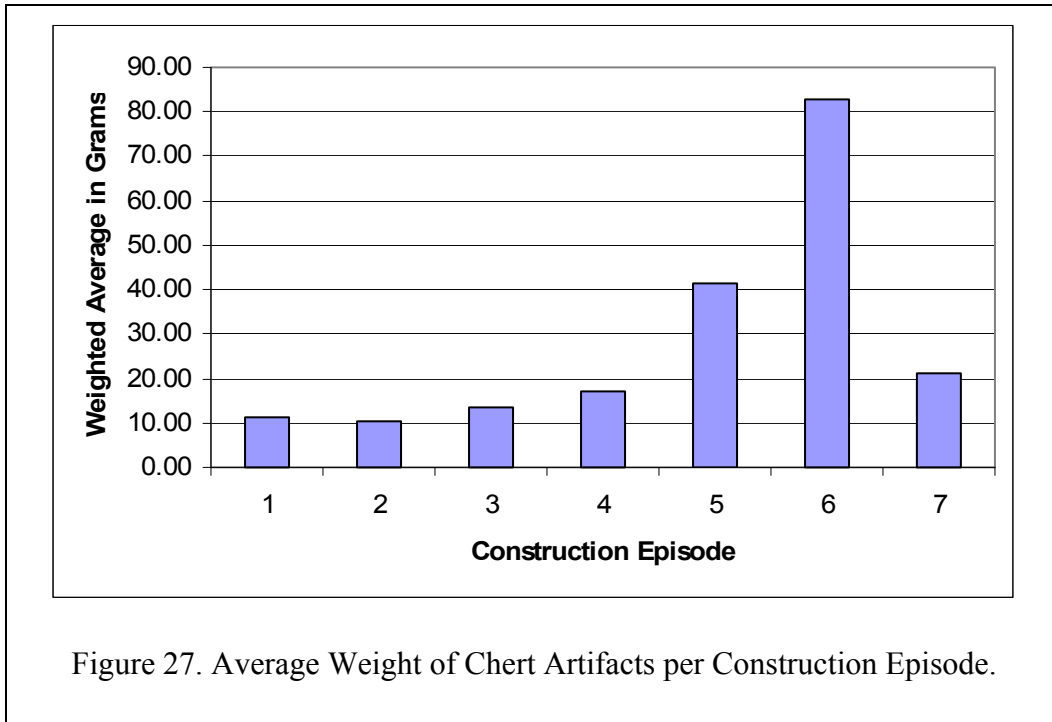
Obsidian Size	1	2	3	4	Sum
Episode 1	0	2	0	0	2
Episode 2	0	0	0	0	0
Episode 3	0	0	0	0	0
Episode 4	0	2	0	0	2
Episode 5	1	3	2	2	8
Episode 6	0	0	0	0	0
Episode 7	4	29	4	0	37
Total	5	36	6	2	49

Table 11. Obsidian Artifact Size per Construction Episode.

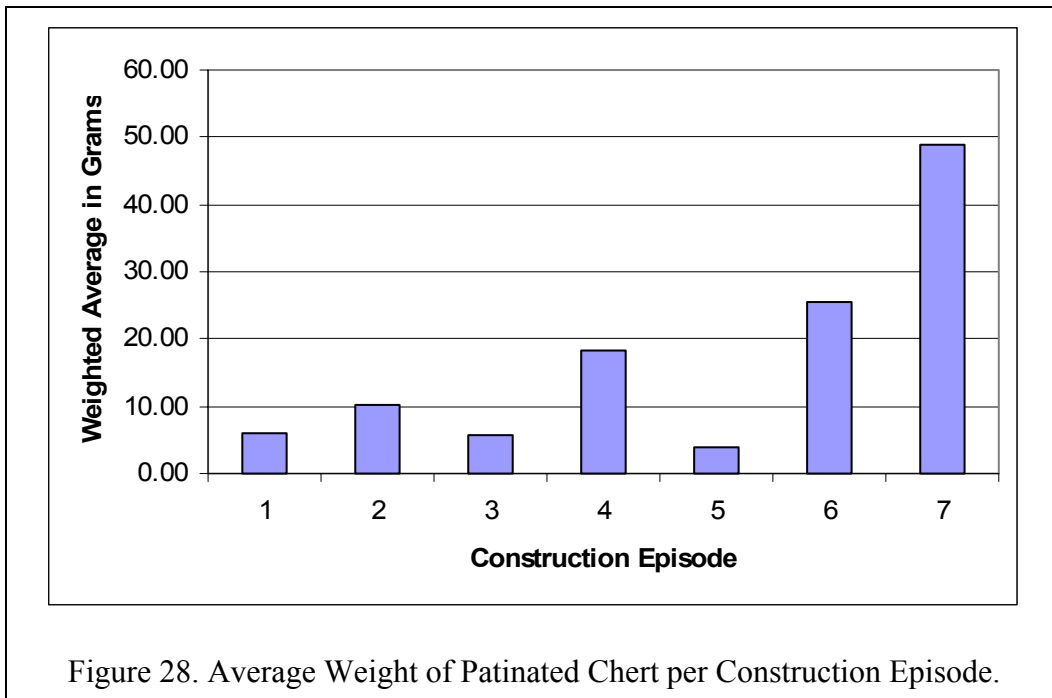
increased over time at Blackman Eddy. It is not known whether the increase in chert availability over time was caused by social change, but there is a possibility that it did. Obsidian artifacts were found in all four size types, but only a few artifacts were of the larger size 2 (Table 11). Though these artifacts were not produced at Blackman Eddy, the data suggest that the obsidian prismatic blades and flakes were likely produced from small to medium-sized cores.

Artifact Weight

The final production attribute used in this study is artifact weight. The average weight of artifacts can be used to infer the size of the core from which it was removed. The main assumption is that artifacts with greater weight were removed from cores with a larger mass. In comparing the weighted average of this attribute for artifacts from deposits associated with the seven construction episodes, the averages are variable and no clear trends emerge in the weight of quartz, quartzite, and obsidian artifacts over time.



There was an interesting trend for the average weight of chert artifacts over time at Blackman Eddy. Analysis of chert weight per construction episode indicated that the average weight of chert artifacts at Blackman Eddy increased across the first six construction episodes and then decreased during the seventh (Figure 27). A 1-sample chi-square test for chert weight indicated that variation between the observed and expected weight per episode was significant enough to reject the null hypothesis. The trend found for chert artifact weight over time is very similar to the trend observed for patinated artifacts at Blackman Eddy and may be related to it. The average weight of patinated chert artifacts per construction shows a similar trend as the average weight for chert artifacts per construction episode, though it is slightly more variable (Figure 28). This seems to indicate that the size of the patinated cores increased over time and may indicate that the size of patinated chert cores used to produce chipped stone tools at Blackman



Eddy increased over time based on the average weight of patinated chert artifacts from deposits associated with the seven construction episodes. The cause for this pattern may be the development of Colha as a major center for the production and exchange of chert and chert tools.

Based on the analysis of the obsidian, quartz, quartzite, and chert chipped-stone artifacts, only the chert flake industry had enough evidence to support the local production of tools at Blackman Eddy. In deposits from each of the seven construction episodes, all of the technological types associated with the production of chert flake tools were found in significant quantities. The size of these artifacts indicates that they were produced from small to mid-size chert cores, and the presence of cortex on a large percentage of chert artifacts indicates that these artifacts were likely produced at Blackman Eddy. These artifacts were likely produced through direct percussion using

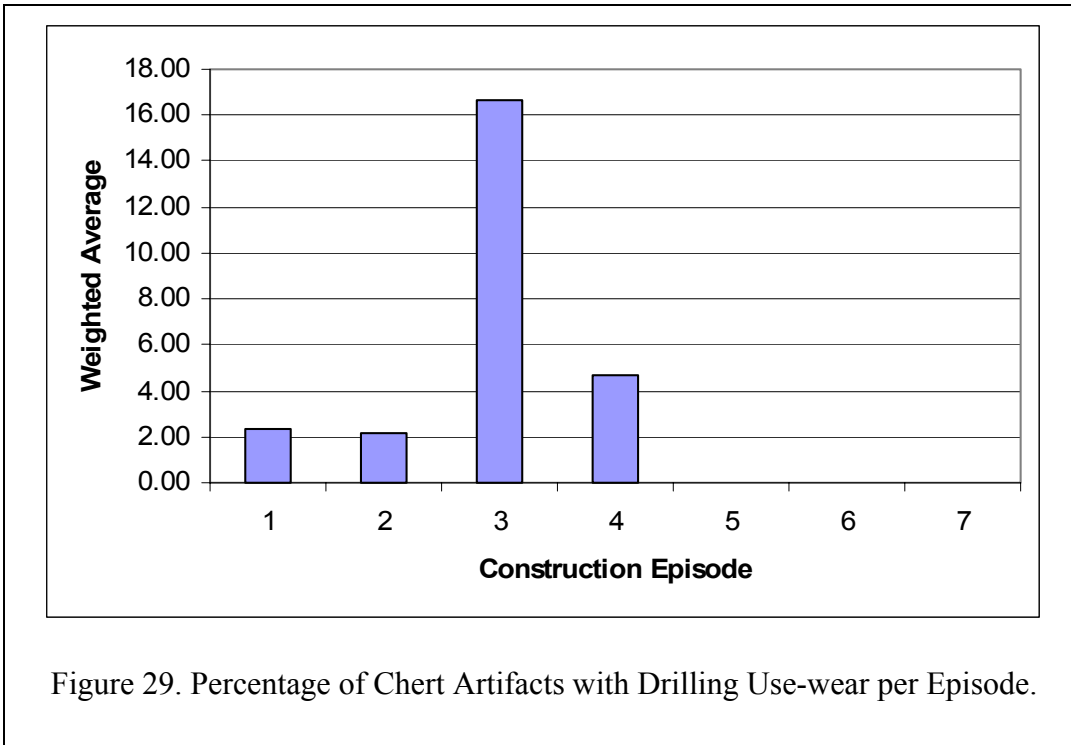
Use-wear	Cut/sawing	Scraping	Engraving	Drilling
Episode 1	84	16	26	3
Episode 2	24	6	15	1
Episode 3	17	0	3	4
Episode 4	28	12	1	2
Episode 5	37	9	4	0
Episode 6	11	4	2	0
Episode 7	11	4	1	0
Total	212	51	52	10

Table 12. Chert Use-wear per Construction Episode.

quartz and quartzite hammerstones procured locally. The production data collected on artifacts from deposits associated with the seven construction episode deposits also suggest that there was little change in chert flake production over time. While variation was statistically significant, these patterns did not correspond to social changes for most of the productive attributes. This means that social change at Blackman Eddy seems to have had little effect on the production of chert flake tools.

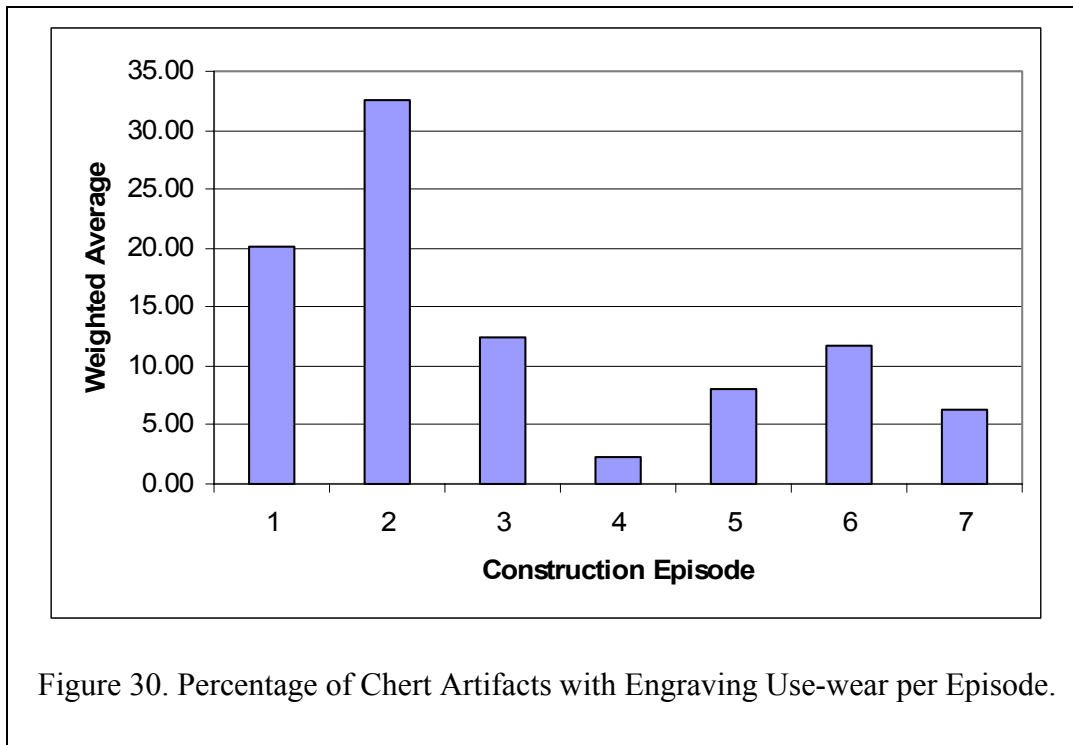
Chipped Stone Function

Functional studies examine artifacts to see how they may have been utilized. The attributes selected in this study to examine artifact function were artifact use-wear and thermal alteration. Artifact use-wear was studied through the analysis of the micro-wear pattern along their edges. The four use-wear categories are: scraping, cutting/sawing, engraving, and drilling. For chert artifacts, cutting/sawing, engraving, and scraping use-wear patterns were found on artifacts from all seven construction episode deposits (Table 12). Cutting /sawing use-wear was the most common use-wear type found on artifacts



sampled from deposits associated with the seven construction episodes, followed by scraping and engraving use-wear. Drilling use-wear patterns were found only on chert artifacts from the first four construction episode deposits. The number of drills found in deposits from each construction episodes was quite low, so the lack of drills in the last three construction episode deposits is likely due to their overall low percentage per construction episode (Figure 29). Chert artifacts with drill use-wear patterns formed 1.6 percent, or less, of the total number of chert artifacts sampled from Str. B1.

Chi-square statistics on use-wear over time indicated that the variation for burins and drills was significant ($X^2_{calc} = 22.87$ and 15.1) but that the variation in cutting and scraping tools was not ($X^2_{calc} = 1.93$ and 10.16). This means that the percentage of chert tools used to cut and scrape did not change significantly over time, while the percentage of tools used to engrave and drill did change. In particular, the percentage of chert



chipped stone tools used for engraving and drilling activities decreased, particularly after the third construction episode (Figure 30). Many of these drills and engravers were found in association with an assortment of freshwater and oceanic shells, possibly indicating the presence of an ornamental shell industry at Blackman Eddy (Cochran 2005). If it can be proven that a shell industry did exist at Blackman Eddy, then it would be an example of local craft specialization at the site. The decline of this industry at the end of the Middle Preclassic period may have occurred during a period of social change at the site. Two possibilities for the decline of the local shell industry at Blackman Eddy may have been the introduction of new types of elite regalia or the importation of shell ornaments from outside the site.

The variability and randomness in percentage of both cutting and scraping use-wear categories for chert artifacts suggests that these tools were used in a variety of tasks

Use-wear	Cut/sawing	Scraping	Engraving	Drilling	Total
Episode 1	0	0	0	0	0
Episode 2	0	0	0	0	0
Episode 3	0	0	0	0	0
Episode 4	2	0	0	0	2
Episode 5	2	0	0	0	2
Episode 6	0	0	0	0	0
Episode 7	6	3	0	0	9
Total	10	3	0	0	13

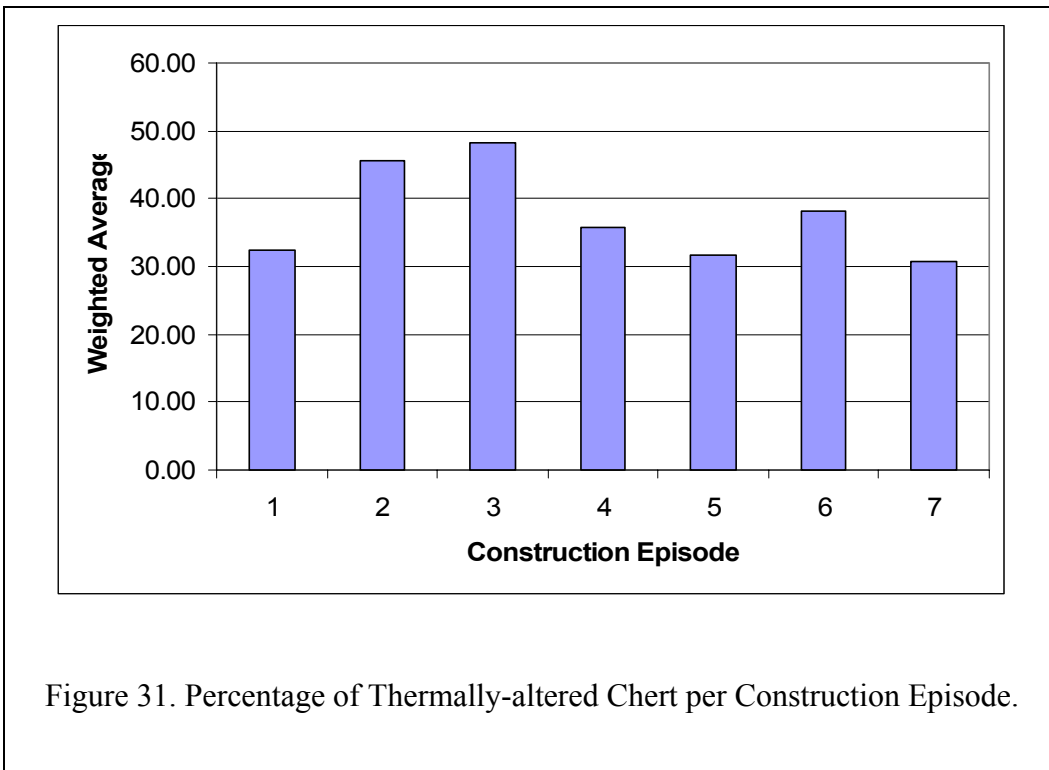
Table 13. Obsidian Use-wear per Construction Episode.

and were not created for any type of specialized activity. Furthermore, the lack of any clear change over time in the use-wear percentages for the seven construction episodes indicates that social change at Blackman Eddy did not have a significant impact on the cutting and scraping activities based on the use-wear patterns on chert flake tools.

A handful of obsidian artifacts from Str. B1 had noticeable use-wear patterns (Table 13). All of these artifacts were from deposits associated with Construction Episode 7. The lack of use-wear on obsidian artifacts from other construction episodes is likely due to sample size. Both cutting/sawing and scraping use-wear patterns were found on obsidian artifacts. All of the obsidian artifacts were found in a ritual deposit associated with Str. B1.2, and the use-wear patterns on them suggest that they may have been used in ritual activity in the Classic period.

Thermal Alteration

The second functional attribute used in this study was thermal alteration. Thermal alteration is the post-production burning of chert artifacts. Thermally-altered chert



artifacts were found in fill sampled from all seven construction episodes (Table 11). The weighted average of thermally-altered chert artifacts was variable from construction episode to episode. Chi-square statistics on the percentage of thermally-altered chert artifacts indicate that the variation is statistically significant enough to reject the null hypothesis. The calculated chi-square value for thermally-altered chert was 32.75.

While change in the percentage of thermally-altered chert was significant, there were no trends over time that corresponded to social change at Blackman Eddy. In fact, the percentage of thermally-altered chert artifacts was relatively high for each construction episode, ranging from 26-47 percent of the total amount of chert artifacts sampled (Figure 31). The high percentage of thermal alteration for chert artifacts in each construction episode suggests that a significant percentage chert artifacts sampled from

Str. B1 were burned before they were deposited in the various buildings suggesting that these artifacts may have been originally been associated with domestic households. If the majority of chert tools did come from domestic trash middens, then this study is primarily looking at chipped stone tools produced at the household level.

Discussion of Chipped Stone Data

As stated at the beginning of this chapter, the purpose of my thesis is to look at the chipped stone artifacts from Str. B1 of Blackman Eddy for changes in the exchange, production, or function of chipped stone artifacts over time and see whether any changes correlate with the social changes inferred from the architectural patterns discussed in Chapter 1. The first social change at Blackman Eddy occurred during the third construction episode when large, public rectangular platforms replaced small, domestic circular structures. Several deposits and features associated with these buildings also suggest that building function changed from domestic rituals to public feasting rituals. This change in building form and function seems to indicate that an early chiefdom may have emerged at Blackman Eddy during the Middle Preclassic period.

The second social change at Blackman Eddy occurred in Classic period during the seventh construction episode of Str. B1. At this time, large pyramid structures replaced rectangular platform structures and single dedicatory caches replace public ritual events. Both of these changes suggest that a highly stratified social hierarchy emerged at Blackman Eddy, possibly associated with the integration of the site into the hierarchy of a regional polity, such as a large chiefdom or state. If this model for Blackman Eddy is

correct, then there should be noticeable changes in the chipped stone tool industries of Blackman Eddy that correspond to the third and the seventh construction episodes.

In this study, several attributes were selected to infer the production, function, and exchange of chipped stone artifacts from deposits associated with the seven construction episodes of Str. B1. Differences in these attributes between the seven construction episodes represent industrial change over time. Three significant changes in the raw material attributes over time that correspond with social change at Blackman Eddy are the change in the type of obsidian found at Blackman Eddy, the increase in the percentage of obsidian artifacts, and the increase of chert artifacts with patination.

During Blackman Eddy's history, the percentage of obsidian artifacts in deposits from the seven construction episode increased over time. For the Middle Preclassic period, only a small and sporadic number of obsidian artifacts have been found. During the Classic period, the percentage and number of obsidian artifacts increased substantially. The increase in obsidian during the Classic period correlates in time with change to a stratified social hierarchy at Blackman Eddy. With the adoption of a highly stratified society at Blackman Eddy, social, political, and economic power would be more concentrated into fewer hands, giving local elites an increased ability to access greater quantities of exotic materials such as obsidian.

Another important change over time is the change in the type of obsidian found at Blackman Eddy. In the first six construction episodes, all obsidian artifacts found in Str. B1 were from the SMJ obsidian source. In the seventh construction episode, most of the obsidian artifacts were from the El Chayal source, supplemented by obsidian from the Pachuca source. While the change in obsidian sources correlates with social change at

Blackman Eddy, this change may be due to socio-political developments in the highland area of Guatemala and the Pacific Gulf Coast.

The final important raw material change over time at Blackman Eddy is the increasing percentage of chert artifacts with patination. In this study, chert patination was a distinguishing feature of non-local chert, possibly from the Belize Zone near the site of Colha. Over time, percentage of chert artifacts with patination increases. Also, the average weight of patinated artifacts per construction episode has a very similar pattern. This indicates that the size of chert cores, as well as the number of chert cores from Colha, increased over time beginning in the Middle Preclassic period until Classic period. While social change over time at Blackman Eddy may have facilitated greater access to non-local chert supplies, I believe that the change in the percentage of chert patination, like the change in obsidian sources, was most likely caused by factors outside of Blackman Eddy.

Overall, there is little change in the raw material attributes of the artifacts sampled from Str. B1, and this suggests that there few significant changes in raw material attributes corresponding to social changes at Blackman Eddy. Particularly, there are no discernable changes in raw material exchange that correspond to the initial social changes that occurred during Construction Episode 3. However, changes in several raw material attributes during Construction Episode 7 suggest that social change at the site did have an impact on the exchange of obsidian. Therefore, the data on raw material exchange only slightly rejects the null hypothesis of this thesis.

Based on my analysis of the production attributes for chipped stone artifacts from Str. B1 at Blackman Eddy, only the chert flake industry had sufficient evidence to

suggest that the artifacts found in each of the seven construction episodes deposits were locally manufactured. There was not enough evidence from the data collected in this study to support the local production of artifacts associated with the obsidian flake, obsidian prismatic blade, or chert biface industries. Based on this conclusion, the only chipped stone industry at Blackman Eddy that would have been directly affected by social change over time would be the chert flake industry. However, there were no detectable changes in any of the production attributes associated with the chert flake across the seven construction episodes, and it appears that chert flake tools were consistently produced over time using the same manufacturing techniques. This lack of discernable change over time in the production of chert flake tools supports the null hypothesis.

Analysis of the functional attributes across the seven construction episodes indicated that there was very little change in artifact function over time. The variation in use-wear among chert tools were used in domestic settings. The high percentage of thermally-altered chert artifacts in deposits from the seven construction episodes suggests that these artifacts were likely burned in trash middens before being recycled as construction fill for the various buildings of Str. B1. There were no significant changes in chert tool function over time based on the analysis of chert artifacts from the seven construction episode deposits. Though several obsidian artifacts analyzed from deposits associated with the seventh construction episode did have noticeable use-wear patterns, no noticeable use-wear patterns were found on obsidian artifacts from deposits in the previous construction episodes. The reason for the distinction in use-wear patterns for Construction Episode 7 deposits may be due to the larger sample size of obsidian artifacts

collected from deposits associated with this episode. All quartz and quartzite artifacts appear to be either hammerstones or hammerstone flakes that may have been used to produce chipped stone tools. However, there were no significant patterns in the functional attributes of these artifacts over time. This lack of change over time in the functional attributes of the artifacts from Str. B1 supports null hypothesis of this thesis.

The hypothesis of this thesis is that the development/introduction of stratified society at Blackman Eddy (as indicated changes in architectural forms and styles) facilitated changes in the various chipped stone tool industries (as reflected by change in the chipped stone artifacts). The null hypothesis of this study is that social change will not lead to significant changes in the chipped stone artifacts from Blackman Eddy. The data collected on the exchange, production, and function of artifacts from the chipped stone tool industries of Blackman Eddy conflict in their support of the null hypothesis. In some cases, artifact variation between construction episodes was not statistically significant. In many statistically significant cases, the variation was random or did not correlate to periods of social change at Blackman Eddy. In the few cases where the null hypothesis was rejected and a patterned correlation with social change was found, there were many external factors that likely contributed to the chipped stone tool variation besides social change at Blackman Eddy. This means that social change does not appear to have had a great impact on the chipped stone tool industries at Blackman Eddy. Interestingly, there are several explanations for why the data provided contradictory evidence for and against the null hypothesis.

One explanation for the ambiguities in the data may be that the null hypothesis is correct and my assumptions about social change leading to economic change are false.

My analysis of the labor costs associated with construction of buildings from each of the seven construction episodes indicated that there was only a slight increase in labor costs until the seventh construction episode. These slight increases in labor costs over time may indicate that the earliest social changes at Blackman Eddy did not significantly increase the socio-political and economic power its emergent elite class. Because social change at Blackman Eddy may not have brought significant changes to the local economy, there would not be a detectable change in the various chipped stone artifacts. This would explain why there was very little change in the chipped stone artifact attributes during Construction Episode 3 when large rectangular platform construction began at Blackman Eddy. However, this explanation does not explain the later correlation between the variation in obsidian artifact attributes and the architectural data from Construction Episode 7.

Another explanation for the conflicting data is the different nature of the chert flake and obsidian artifacts found in the various construction episode deposits. The chert flake industry at Blackman Eddy produced the largest percentage of tools found in Str. B1 and appears to have been the most widely used tool at Blackman Eddy. Based on the analysis of production and function attributes, most of the chert artifacts found in Str. B1 were produced and used in domestic settings from locally available raw materials. Social change may not have as strong an impact on domestic economic activities because elite management over domestic activities is highly variable across pre-capitalist societies, ranging from non-existent to all-encompassing (Brumfiel and Earl 1987:4). The low technological requirements needed to produce flake tools and the relative availability of chert in the Belize River Valley may have made it improbable for elites at Blackman

Eddy to control the exchange and production of most of the chert tools found at the site and may have provided little incentive for them to do so. If local elites were not involved in managing domestic activities at Blackman Eddy, including the procurement and production of chert flake tools, then social change at Blackman Eddy would not bring significant changes in the production, function, or exchange of chert flake artifacts.

The most likely types of chipped stone artifact to be affected by social change are those artifacts whose production and/or exchange can be controlled by an elite class. Rulers and would-be rulers take a more active interest in the production, procurement, and distribution of wealth than subsistence because wealth is the means by which rulers define their own social status and the status of others (Brumfiel and Earle 1987:4). Obsidian artifacts and chert artifacts with patination are two types of artifacts at Blackman Eddy whose production and exchange may have been controlled by elite sponsorship at Blackman Eddy.

First, there are no known obsidian deposits in Belize. In areas where there are little or no outcrops of obsidian, all raw obsidian must be imported. This creates a premium cost for obsidian based on the high transportation costs. The cost to import obsidian artifacts into Blackman Eddy may have been beyond the ability of most individual households to support on a regular basis. A similar argument can be made for the transportation cost of patinated chert from Colha, though the transportation cost of these items would likely have been lower than those associated with obsidian exchange. With the development of an elite class at Blackman Eddy, obsidian artifacts and Colha chert may have been imported in increasing quantities due to the ability of elites and would-be-elites to pool resources to facilitate exchange of such items.

Besides transportation costs, the production costs of some types of tools may have been controlled by elites and aggrandizers through specialized production. Specialization is “the production of alienable, durable goods for non-dependent consumption” (Clark and Parry 1994:297). Based on this definition, all societies at various levels of complexity have some form of specialization. This is because specialization is not a single phenomenon with a single cause but incorporates various economic relationships (Earle 2000:128). The type of specialization that I would like to consider in this thesis is attached specialization. Attached specialization is the production of goods or special services under the sponsorship of a patron, typically elite such as a chief or lord, who retains control over the use and distribution of these goods (Brumfiel and Earle 1987:5). By controlling the production and distribution of certain items of social importance, elites and would-be elites can maintain or gain social status through attached specialization. In Mesoamerica, elites and aggrandizers may have sponsored the production of obsidian prismatic blades as a means to increase or sustain their social status.

Obsidian prismatic blade production is one type of technology that can be easily controlled by elites and emerging elites. The technology used to produce prismatic blades is neither portable, flexible, nor easily mastered (Clark 1987:268). The high costs involved to train individuals to produce obsidian prismatic blades may have been beyond the economic ability of individual households to support in areas where obsidian is not readily available for several reasons. First, the creation of prismatic blades takes time to learn in order to produce effectively useful prismatic blades. Craftsmen must develop excellent hand-eye coordination and personal motor skills to make repetitive blows in a

regular manner and to overcome knapping errors without ruining the core used for blade production (Clark 1987:268).

Second, blades cannot be produced on the fly; effective blade production requires special tools and set up time to create. Third, blade-making skills need to be maintained over time by craftsmen, and the lack of practice, even over a short span of time, weakens the craftsman's abilities (Clark 1987:267). Effective prismatic blade makers must make enough blades on a regular basis to maintain skill levels and this requires a steady flow of raw materials. If a blade specialist does not produce blades on a regular basis, these skills will deteriorate over time. Though blades were not produced at Blackman Eddy, the overall import cost of these artifacts may have included the production costs as well, making it nearly impossible for average households to import. The chipped stone data from Blackman Eddy support this idea because obsidian prismatic blades were not exchanged into Blackman Eddy before the emergence of an early chiefdom at the site.

In conclusion, chipped stone artifacts associated with domestic economic activities at Blackman Eddy support the null hypothesis and artifacts associated with elite sponsorship refute the null hypothesis. As a result of social change over time at Blackman Eddy, a wide variety of exotic goods, particularly obsidian and chert from Colha, were brought into the site under the sponsorship of an elite class. However, there is little evidence from the chipped stone artifacts of Str. B1 that supports the idea that Blackman Eddy had direct control over the production or regional exchange of these artifacts. The next chapter offers a more complete view of the regional exchange of obsidian and chert with the analysis of the distribution of obsidian and chert chipped stone artifacts from several other sites in Belize.

Chapter 4- Regional Look at Chipped Stone Tool Production

The previous chapter examined the production of chipped stone tools at Blackman Eddy from the Middle Preclassic through the Classic periods. One conclusion from this study of chipped stone artifacts in each of the seven construction episodes of Str. B1 is the continual and overwhelming use of local chert in the production of chert tools. The production of chert tools changed very little over time and does not appear to have been influenced by social change at Blackman Eddy. The second conclusion was that the number of obsidian artifacts per construction episode increased over time, with a dramatic spike occurring during the Classic period. The increase in the number and percentage of obsidian artifacts per construction episode indicates that the exchange of obsidian increased over time and may have been caused by the integration of Blackman Eddy into a highly-stratified social hierarchy such as a paramount chiefdom or state. A similar trend was also observed for the percentage of patinated chert artifacts per construction episode.

What is not known is whether these conclusions were unique to Blackman Eddy or whether they were part of a greater regional economic pattern of stone tool production and exchange. In order to better understand the socio-economic changes that occurred during the Preclassic and Classic periods, the chipped stone tools industries of five contemporary sites of Blackman Eddy in the eastern lowland region of Belize were examined. The focus of this study was on the chert and obsidian tools manufactured and exchanged in each of these sites. Three of these sites, Cuello, Colha, and Cerros, are

located in the northern region of Belize. The other two sites, Barton Ramie and Cahal Pech, are located in the Belize River Valley.

Colha

Colha was originally documented in 1973 by the British Museum Cambridge University Corozal Project of 1973-1974. After its initial discovery, extensive excavations and archaeological studies were undertaken at Colha. Ceramic correlations and radiocarbon dates from Colha indicated that the site was occupied from about 1000 B.C. to A.D. 1250 (Shafer and Hester 1983:521). Colha covers an area of about 4 square kilometers and has a modest ceremonial center of several small structures with four to five courtyards (Shafer and Hester 1983:521). Colha is not a very large site and was classified as a small major center. What makes Colha unique is not the size or scale of its architecture but its extremely high frequency of chert tools and by-products.

Chert was the most widely used raw material type at Colha across its occupation. One reason for the high percentage of chert tools at Colha is a result of the large quantities of high-grade chert found there. Chert nodules are found in weathered outcrops along Rancho Creek, up to 1 m. wide and almost 1 m. thick (Shafer and Hester 1983:521). The evidence supporting the manufacture of chert tools at Colha is quite convincing. First, the physical characteristics of the raw chert nodules at or near Colha are identical to the chert artifacts from Colha. Second, the number of chert tools and chert tool by-products recovered from archaeological settings is significant. Finally, a large number of exhausted cores were found in pazuclas and house mounds in Colha (Shafer and Hester 1983:521). The large number of chert tools at Colha has led archaeologists to

determine that Colha was a major center for chert tool production, and archaeologists have found and classified 31 Preclassic chipped-stone workshops at Colha (Shafer and Hester 1983:528). A variety of formal chert tool types have been documented at Colha, including stemmed macro-blades, tranchet-bit tools, oval bifaces, and T-shaped tools (Hester 1991:194). These formal tools (particularly the stemmed macro-blades) were exchanged across much of the northern region of Belize and other areas in Mesoamerica (Clark and Lee 1979; Hester 1991; Mohol-Nagy 1976). The production of formal chert tools at Colha began sometime during the Middle Preclassic period (Hammond et al. 1991; Hester 1985; McAnny 1989). However, it was during the Late Preclassic period when production increased dramatically at Cuello (Shafer and Hester 1983:535).

Though much smaller in number, obsidian has also been found in the Preclassic and Classic period deposits at Colha (Brown et al. 2004:226). From the Preclassic deposits, 148 obsidian artifacts found in several different Colha contexts have been analyzed to determine their source (Brown et al. 2004:227; Table 11). Results from this analysis indicate that the three main sources of Preclassic obsidian were El Chayal (N = 42), SMJ (N = 35), and Ixtepeque (N = 26). Based on ceramic evidence, the obsidian sampled from Colha was organized according to Preclassic sub-phases (Middle, Late, and Terminal) to look for trends over time (Brown et al. 2004:230). The results show that SMJ obsidian was an important Preclassic commodity at Colha, but there was a significant drop in the number and percentage of SMJ obsidian during the Late and Terminal Preclassic periods (Brown et al. 2004:232). The rise of El Chayal obsidian and the decline of SMJ obsidian at Colha continued at in an almost inverse relationship, as SMJ obsidian practically disappears by the Late Classic period (Brown et al. 2004:232).

Period	SMJ	El Chayal	Ixtepeque	Total
Early Middle Preclassic	14	7	1	22
Late Middle Preclassic	16	19	22	57
Late Preclassic	5	16	3	24
Classic	2	103	94	199

Table 11. Colha Obsidian Artifacts and Sources, after Brown 2004.

Cuello

Cuello was also found through survey work conducted by the British Museum Cambridge University Corozal Project of 1973-1974 (Hammond et al. 1991:8). The excavations at Cuello found a significant amount of preclassic pottery, including Mammon sherds from the Middle Preclassic and Chicanel sherds from the Late Preclassic (Hammond et al. 1991:8). Like Colha, preclassic chipped-stone tools were found at Cuello, and they have been studied to understand Preclassic tool production and exchange. The two most important raw material types documented in the Cuello chipped stone tools were chert (N = 2,135) and obsidian (N = 360) (McSwain and Johnson 1991:160).

The chert from Cuello was classified into two general categories based on physical characteristics. The first category was called Colha chert and was characterized by a fine-grained gray or brown chert that was occasionally banded (McSwain and

Johnson 1991:160). As the name suggests, this chert had physical characteristics similar to chert found in Colha and its surrounding quarries. The second chert category, designated other, includes a rough white chert and a translucent chert of white, brown, and gray (McSwain and Johnson 1991:160). Both of these types of chert were used in the production of chipped stone tools during the Preclassic period, but a higher percentage of Colha variety chert was present in Cuello's Late Preclassic deposits (McSwain and Johnson 1991:169; Table 12).

The presence of chert tool manufacturing debris in both the Middle and Late Preclassic deposits at Cuello for both the local and Colha varieties of chert indicated that the manufacture of tools made from both Colha and local chert took place at Cuello during the Middle and Late Preclassic periods (McSwain 1991:193). Also, the presence of cortex on a large number of chert artifacts from the Middle and Late Preclassic deposits at Cuello also support the idea of local production for chert tools. Cortex was present on 19 percent of chert artifacts from the early Middle Preclassic, 11 percent of late Middle Preclassic chert artifacts, and on 14 percent of all Late Preclassic chert artifacts (McSwain 1991:193).

Several different types of chert tools were found in the preclassic deposits at Cuello, and these were divided into a two-level, inter-related system (McSwain and Johnson 1991:161). Examples of first-level tools are oval bifaces, tranchet-bit tools, and stemmed macro-blades. Another important tool found at Cuello was chert blades that were trapezoidal in cross section. Interestingly, no blade cores were found at Cuello, and it is not known whether blades were produced locally or exchanged as finished tools. The second level consisted of tools made from chert by-products. This level includes

<u>Period</u>	<u>Colha</u>	<u>Other</u>	<u>Total</u>
Early Middle Preclassic	117	212	329
Late Middle Preclassic	78	233	311
Late Preclassic	619	658	1277
Total	814	1103	1917

Table 12. Colha and Other Chert Artifacts at Cuello, after McSwain and Johnson
1991.

expedient tools and tools made from recycled formal tools. The low number of formal tools found at Cuello suggests that secondary chert tools were much more prominent than the first category, though both primary and secondary tools were found in Middle and Late Preclassic deposits at Cuello (McSwain and Johnson 1991:171). The evidence for chert tool production over time is one of continuity in tool types and production processes (McSwain and Johnson 1991:172).

Despite the high level of continuity across the Preclassic, there were some significant changes in the tool industry between the Middle and Late Preclassic periods at Cuello. One of the trends is an increase in Colha variety tools between the Middle and Late Preclassic periods, particularly oval bifaces (McSwain and Johnson 1991:172). About 40 percent of the Early Middle Preclassic chert artifacts were made from Colha-like chert and 60 percent was manufactured from local varieties (McSwain and Johnson 1991:168). The percentage of Colha chert dropped during the Late Middle Preclassic to about 32 percent but rose during the Late Preclassic to 49 percent of the total number of chert artifacts (McSwain and Johnson 1991:169). The increase in Colha variety tools at

Cuello took place at the same time as large-scale production of chert tools began at Colha. The evidence from both sites strongly suggests a system of exchange for chert tools during the Late Preclassic period.

The second most widely used raw material for chipped stone tool production at Cuello was obsidian. However, the amount of obsidian found at Cuello is much smaller than the amounts of chert tools from both the Middle and Late Preclassic periods (McSwain and Johnson 1991:169). Some of the obsidian found at Cuello is quite early, dating to the Bladen IIIA Phase (800- 600 B.C.). The main obsidian sources were identified for both the Middle and Late Preclassic period deposits at Cuello were: El Chayal, Ixtepeque and SMJ (McSwain 1991:194). Though the actual percentages of each site were different in each phase, there does not appear to have been a preference for any of the obsidian sources during the Middle and Late Preclassic periods at Cuello (McSwain 1991:194). Obsidian sourcing from the Cuello samples suggests that obsidian exchange at Cuello was complicated and varied during the Preclassic period, and it may have arrived in Cuello through different exchange routes than those of other sites in the eastern lowland region.

Several different obsidian technological types were found at Cuello, including 12 flakes, 4 blades cores, 225 blades, and 12 biface fragments (McSwain and Johnson 1991:169; Table 13). Prismatic blades are the most common type found in both the Middle and Late Preclassic deposits at Cuello, forming nine percent of the total obsidian found in Mammon deposits and 86 percent in Chicanel deposits, and the number of prismatic blades increased over time (McSwain and Johnson 1991:169). In Mammon phase deposits, only four prismatic blades were found (McSwain and Johnson 1991:169).

<u>Period</u>	<u>Blades</u>	<u>Flakes</u>	<u>Cores</u>	<u>Bifaces</u>
Middle Preclassic	6	0	0	0
Late Preclassic	38	4	0	0
Early Classic	49	0	0	0
Late Classic	30	3	0	0
Unknown	102	5	4	1
Total	225	12	4	1

Table 13. Obsidian Artifacts at Cuello, after McSwain and Johnson 1991.

From later Chicanel deposits at Cuello, 38 obsidian blades were found (McSwain and Johnson 1991:169).

The presence of blade cores at Cuello suggests that obsidian blades were produced at this site, but obsidian prismatic blade manufacture was limited. No large obsidian macro-flakes have been found at Cuello. This suggests that cores were exchanged into Cuello as prismatic cores. Obsidian appears to have been a valuable resource at Cuello. Blades were not the only tools produced from blade cores at Cuello as several of the obsidian flakes found have production characteristics suggesting that they were removed from exhausted cores after the production of prismatic blades (McSwain and Johnson 1991:170). It is not known exactly when blade production occurred at Cuello because none of the blade cores was found in dated contexts (McSwain and Johnson 1991:170).

Cerros

Cerros is a coastal site located in brackish waters between Laguna Seca and The Chetumal Bay (Freidel et al. 1986:1). Cerros had a meteoric rise and fall completely within the Late Preclassic period. This rise and fall is largely due to its location near Late Preclassic Caribbean trade routes that changed during the Classic Period away from Cerros (Freidel et al. 1986:1). The occupation of Cerros has been divided into three phases: The Ixtabai Phase (300-200 B.C.), the C'oh Phase (200- 50 B.C.), and the Tulix Phase (50 B.C. - A.D. 150).

Excavations within deposits of each of the three phases of Cerros have recovered a substantial amount of data for the Late Preclassic period. 51 chipped stone tools were analyzed from excavations that date to Ixtabai Phase (Lewenstein 1984:247). Of these 51 chipped stone tools, only four artifacts were made of obsidian, and the remaining artifacts were made from chert (Lewenstein 1984:273). Chert tools were found in a variety of different forms: oval bifaces, tranchet-bit tools, adzes, and macro-flakes. Many of these tools are similar in their design and manufacture to the chert tools from Colha, making it likely that these chert tools were imported from Colha to Cerros as part of an exchange system (Lewenstein 1984:248). This exchange system involved the importation of mass-produced, finished chert tools to Cerros from Colha. Use-wear analysis on Ixtabai tools indicated a large number of tools were used for domestic, everyday tasks

51 stone tools were analyzed from C'oh Phase contexts (Lewenstein 1984:278; Table 14). During this phase, fewer oval bifaces and finished tools were recovered from structures and middens, and the quality of the chipped stone tools during this phase

Period	Obsidian	Chert	Total
Ixtabai	4	47	51
C'oh	4	47	51
Tulix	53	301	354
Classic	24	226	354

Table 14. Obsidian and Chert Artifacts from Cerros; after Lewenstein 1984.

declined. Unlike the Ixtabai Phase chert tools, the C'oh phase chert artifacts are not standardized, and many of these tools (particularly the chert bifaces) are unfinished and crude in appearance (Lewenstein 1984:293). The decrease in quality and quantity of mass-produced tools during this phase signals that fewer chert tools were being imported from Colha into Cerros as more expedient chert tools were produced locally (Lewenstein 1984:293). Tool use-wear patterns during the C'oh phase showed an increase in the number of scrapers, graters, and perforators, and there was a slight drop in adzes and oval bifaces (Lewenstein 1984:293). Obsidian blades are present in C'oh phase contexts, but their numbers are low as well.

354 chipped stone tools were analyzed from Tulix Phase contexts. 291 of these artifacts were made of chert and 53 were made from obsidian. There is a marked 20 percent increase in the percentage of obsidian used at Cerros, and use-wear was found on twice as many obsidian artifacts than in either the Ixtabai or C'oh Phases (Lewenstein 1984:278). The increase in obsidian consumption were attributed to a large sample size for the Tulix Phase and an overall increase in chipped stone tool consumption tools by a larger population (Lewenstein 1984:278).

Barton Ramie

Barton Ramie is located in the Belize River valley about 15 kilometers northeast from the town of San Ignacio. The site is on the north bank of the Belize River, along part of an oxbow meander between the towns of Spanish Lookout and Mount Hope (Willey et al. 1965:31). This site is about 3 km west of Blackman Eddy. Excavations at Barton Ramie occurred after a large tract of land was cleared, revealing an extensive Maya settlement. Barton Ramie has a long occupation sequence from the Middle Preclassic through the Classic period. Relative dating of the structures has been conducted based on the ceramics found within excavations, allowing archaeologists to place the 262 structures mapped for the site in a temporal order. What makes Barton Ramie an interesting site is that it does not have a site core. Only one structure at Barton Ramie, BR-180, was classified as a temple structure (Willey et al. 1965:34).

A wide variety and number of chipped stone tools were examined during the course of the archaeological excavations at Barton Ramie. Chipped stone tools were classified into four categories: utilitarian chert, utilitarian obsidian, ceremonial chert, and ceremonial obsidian (Willey et al. 1965:410). Tools were classified into one of these four classes based on where they were found: burials, ritual caches, or middens. They were also sub-divided according to their physical attributes. The two most common raw material types used in the manufacture of stone tools found at Barton Ramie were obsidian and chert, referred to as “flint” by Willey.

Chert was the most common raw material used for the production of chipped stone tools at Barton Ramie. Though no assessment of informal chert tools or debitage was done during the excavations, 3,000 pieces of “chert scrap” were found at the site

(Willey et al. 1965:440). The chert colors found at Barton Ramie were: white, honey, lavender-bluish, gray-white, gray, dark brown, and purplish-white. All of these colors and physical characteristics were also observed for the chert artifacts from Blackman Eddy and for the chert nodules sampled from the Belize River Valley. The similarity in chert color between Barton Ramie, Blackman Eddy, and the survey samples suggests that the inhabitants of Barton Ramie (like those at Blackman Eddy) were using chert sources in the Belize River Valley for the manufacture of chipped stone tools.

Utilitarian chert scrapers, adzes, choppers, drills, knives, and punches were found in each of the different temporal deposits at Barton Ramie. Most of these tools were likely made through household production and do not appear to be mass-produced like the chert tools from Colha. For example, the utilitarian bifaces from Barton Ramie are crudely shaped and are very thick. These bifaces have little or no bifacial thinning, and only the edges appear to have any extensive modification from pecking (Willey et al. 1965:410).

Like the utilitarian chert, the ceremonial chert appears to have been made from local chert supplies, though the quality and craftsmanship of these tools is much higher than utilitarian tools. Most of the evidence for ceremonial chert comes from the Classic and Late Classic deposits (Willey et al. 1965:446). Several chert stemmed macro-blades and stemmed bifaces do date to the Late Preclassic. The stemmed macro-blades, referred to as plano convex stemmed knives, are similar to the Colha variety stemmed macro-blades but date much later than the Late Preclassic Colha types (Hester 1991:198). The presence of larger numbers of ceremonial chert tools from the Classic period may be an indication of part-time craft specialization sponsored by an elite class at Barton Ramie.

Obsidian was also recovered from excavations at Barton Ramie, but it was found in much smaller quantities than the chert. The only type of obsidian found at Barton Ramie is a gray-black variety used in the manufacture of both utilitarian and ceremonial obsidian tools (Willey et al. 1965:423). All ceremonial obsidian artifacts, particularly eccentrics, were found either in Classic or Late Classic period deposits at Barton Ramie, whereas utilitarian obsidian artifacts were found in each of the temporal phases of Barton Ramie. The most common utilitarian obsidian artifacts found at Barton Ramie were prismatic blade fragments. The number of blades increases over time, reaching a climax of 442 blades in the Late Classic period (Willey et al. 1965:445). The actual evidence for obsidian production at Barton Ramie is sparse. There are no large obsidian flakes, chunks, or flake fragments in any of the different deposits. Several obsidian cores were found at Barton Ramie, but these date to the Classic and Late Classic periods (Willey et al. 1965:442). It is likely that prismatic blades were produced at Barton Ramie during the Classic and Late Classic periods but there is no evidence for obsidian blade production during the Middle or Late Preclassic periods. Based on this evidence, Preclassic obsidian tools were likely exchanged into Barton Ramie but not produced there.

Cahal Pech

Cahal Pech is a medium-sized Maya site located in the Belize River Valley on the outskirts of San Ignacio and consists of 34 structures in seven plazas (Lee and Awe 1994:25). This site is about 20 km south-southwest of Blackman Eddy. Cahal Pech has a long occupational history that spans the Middle Preclassic through the Postclassic period, with the vast majority of construction beginning during the Late Preclassic period (Healy

and Awe 1994:195). The most common raw material used in the production of stone tools at Cahal Pech during its occupation was chert. Initial analysis of chert chipped stone tools was completed for lithic artifacts recovered from excavations into Plaza A during the 2004 BVAP field season. This analysis indicated that chert is the most frequent raw material type used for the manufacture of chipped stone tools during the different temporal phases of Cahal Pech's history. A wide variety of colors was found for the chert artifacts from Cahal Pech, all of which were similar to the chert colors observed in the chert samples from the Belize River Valley and the chert artifacts from Blackman Eddy.

Obsidian artifacts from Cahal Pech have been classified into two categories: obsidian blades and obsidian flakes (Awe et al. 1992:2). Obsidian blades were discovered on floors from the late Middle Preclassic and Late Preclassic periods (Awe and Healy 1994). A few of the flakes contain small amounts of cortex and all of the flakes a variable in shape and form (Awe and Healy 1994:197). The flakes were probably manufactured from spall cores using direct percussion and bipolar production (Awe and Healy 1994:197).

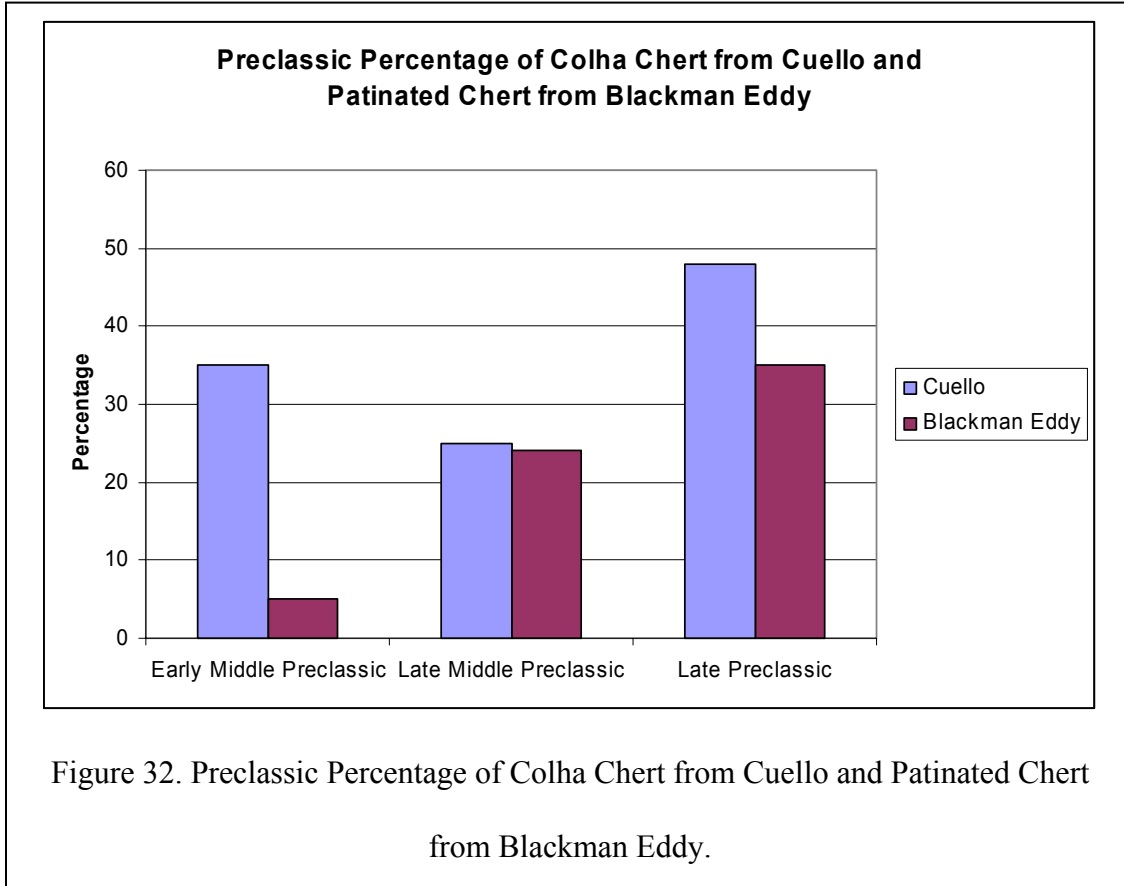
Prismatic blades first appear at Cahal Pech on floors associated with the late Middle Preclassic periods (Awe and Healy 1994:197). Further evidence for the adoption of prismatic blades at Cahal Pech during the Middle Preclassic is the discovery of a blade core at the Cas Pek group (a contemporary Middle Preclassic location on the periphery of Cahal Pech). Another piece of evidence was an obsidian prismatic blade core found in a Late Middle Preclassic deposit (Lee and Awe 1994:197).

Another change that occurred between the early Middle Preclassic and the late Middle Preclassic and Late Preclassic periods at Cahal Pech is the obsidian sources used

in the manufacture of obsidian artifacts. The obsidian flakes from early Middle Preclassic Pech originated from the El Chayal quarries in the Guatemala highlands (Awe and Healy 1994:202). Obsidian used at Cahal Pech during the late Middle Preclassic period and subsequent periods comes primarily from the San Martin Jilotepeque source (Awe and Healy 1994:202).

Discussion of the Regional Study of Chipped- Stone Tool Industries

Several general conclusions can be made for the chipped stone tool industries of the eastern lowland area of Belize during the Preclassic and Classic periods. First, chert was the most important raw material used in the manufacture of chipped stone tools across all periods of time in both the areas in the north and the Belize River Valley. With the rise of Colha in northern Belize as a major chert production center during the Late Preclassic, finished chert tools were exchanged across most the northern region. This is clearly seen at Cuello and Cerros where a large increase in both formal tools of Colha style and color were found in Late Preclassic deposits. There is also evidence from the sites of Barton Ramie and Blackman Eddy suggesting that tools and raw materials from Colha made their way into the Belize River Valley, though in much smaller numbers when compared to sites in the north. At Blackman Eddy, the presence of a chert macro-blade made in a style similar to Colha blades was found in an early Middle Preclassic deposit. Also, a significant percentage of patinated chert, likely from sources in the north near Colha, was present in deposits associated with the Middle and Late Preclassic periods (Figure 32). Several Colha-like tools were found in Barton Ramie, but these deposits dated to the Classic period or later. However, the exchange of Colha variety tools did not



completely replace local manufacture of chert tools at any of the sites examined in this study.

The second conclusion relates to the exchange of obsidian into the Belize River Valley and the northern region of Belize. Obsidian exchanges began very early, possibly during the early part of the Middle Preclassic (1000- 800 B.C.). Most of the evidence from the north and south of Belize suggests that blade production may have been extremely limited to only a few sites in the region. There is some evidence for the manufacture of prismatic blades in the north based on the evidence from Cuello in the north, though the proveniences of the four obsidian blade cores from the site are not

known (McSwain and Johnson 1991:170). In the south, evidence from Cahal Pech suggests that obsidian tools were produced at the site from obsidian cores imported from the highland region. During the Middle Preclassic, obsidian flakes were produced from obsidian cores using direct percussion and bipolar percussion. During the Late Middle Preclassic, the production of obsidian prismatic blades replaced the production of flake tools.

Based on the data from the eastern Maya lowland sites of this study, several trends are apparent for the exchange of obsidian. First, San Martin Jilotepeque obsidian appears to have been the dominant source for obsidian tools used during the Middle Preclassic. During the Late Preclassic and Classic periods, El Chayal becomes the main source in most sites. However, this pattern was not uniform across the entire region. El Chayal may have been exchanged more in the north, based on the evidence from Cuello and Colha. Also, trace element analysis of the obsidian from Cahal Pech indicated that the trend was reversed: El Chayal obsidian was used during the early Middle Preclassic and was replaced by SMJ obsidian during the late Middle Preclassic. All of this indicates that the exchange of obsidian was more complex than what most current models indicate, though the general trends for exchange appear to be correct based on data.

Second, there is a noticeable increase in the number of obsidian artifacts over time at each of these sites. During the Late Preclassic, obsidian was brought into the northern region and the Belize River Valley in larger quantities than they were during the Middle Preclassic period. The increase in obsidian may be linked to increasing populations and formalized social hierarchies for both the northern region of Belize and the Belize River Valley. The trend found for localized chert production, and the increase in the supply of

obsidian prismatic blades is similar to the trends found at Blackman Eddy during the Middle and Late Preclassic. The only exception found in the larger region that was not documented at Blackman Eddy was the exchange of Colha variety chert tools in the north during the Late Preclassic

Chapter 5- Summary and Conclusions

The purpose of my thesis is to look at social change at Blackman Eddy and its economic impact based on the chipped stone tool and architectural data from the Preclassic and Classic periods. Social change at Blackman Eddy is inferred from shifts in the architectural patterns and function of Structure B1 (Brown 2003). Under this assumption, rises in social complexity are linked to public architecture and the roles that these building played in society (Brown 2003:1). For Blackman Eddy, three important changes in social relations occurred during the site's occupation, as inferred from changes in architectural patterns of Str. B1. To test the three-stage model of social development at Blackman Eddy, the chipped stone tool industries of the site were examined for significant change over time. Because economic activities are integrated within the larger societies of which they are a part, social changes should create noticeable economic changes in the archaeological record. The hypothesis of this thesis is that social change at Blackman Eddy (as indicated by changes in the architectural characteristics and functions of the various buildings associated with Str. B1) caused changes in the chipped stone tool industries (as reflected by the changes the chipped stone artifact attributes). The null hypothesis to be tested in this thesis is that social change at Blackman Eddy did not cause significant changes in the chipped stone tool industries of Blackman Eddy.

Blackman Eddy has a history of occupation that dates from the early Middle Preclassic period (around 1200 B.C.) through the Postclassic period (A.D. 900). The first buildings of Str. B1 were small, domestic circular structures built with low labor costs.

During the latter part of Middle Preclassic, building form changed from circular structures to more labor-intensive, rectangular platforms. The labor costs associated with platform construction increased with each subsequent building episode. The higher costs indicate that many of the non-domestic structures were community undertakings that involved the pooling of labor from several households. The increase in construction costs and change in structure design marked a shift from domestic residences to public buildings and may have signified the establishment of an emergent chiefdom at Blackman Eddy. However, the estimated building volume from episode to episode was not very high and indicated that the increases in labor costs over time may not have been as significant as previously thought, indicating that elite power at Blackman Eddy may have grown slowly over time after the initial establishment of chiefdom and may have been limited during the Middle Preclassic period. If the power of the chief was limited at Blackman Eddy, then the impact of social change at the site may have not had as much of an impact on economic activity until the Late Preclassic when rectangular platforms were replaced by large pyramid structures.

In the final construction episodes of Str. B1, large pyramid structures replaced rectangular platforms as social stratification intensified at Blackman Eddy. Stucco masks, multi-tiered platforms, and in-set staircases were found associated with the final three construction episodes of Str. B1. These new architectural characteristics may indicate that Blackman Eddy was incorporated into the socio-political structure of a paramount chiefdom or state during the Late Preclassic or early Classic period. The two major changes in architectural style and form in Str. B1 occurred during the third and seventh construction episode, and they were assumed to be evidence of social change at

Blackman Eddy. Important changes in the chipped stone tool industries of the site should occur in and around these periods of change.

The four chipped stone tool industries at Blackman Eddy are the chert flake, obsidian flake, chert biface, and obsidian prismatic blade industries. The attributes examined for artifacts within each of these industries were: raw material type, color, patination, translucence, technological type, cortex, size, use-wear, and thermal alteration. Chi-square tests indicated that much of the patterned variation in artifact attributes across the seven construction episodes was significant. However, in most of these cases, the variation did not correlate to the periods of social change at Blackman Eddy, or the variation was caused by external factors.

Based on the analysis of the artifact attributes associated with the production of chipped stone tools, the only industry at Blackman Eddy that had conclusive evidence for the local production of chipped stone tools was the chert flake industry. This was likely a non-specialized household activity outside the control of local elites. Social change at Blackman Eddy had no direct impact on how chert flake tools were procured, made, or used over time. Also, there is little evidence to support the proposition of local manufacture of chert bifaces at Blackman Eddy. Though several bifaces were recovered in excavations from the seven construction episodes, the lack of bifacial thinning flakes in the archaeological record indicates that most biface production took place outside of Blackman Eddy. Using the data collected from survey work and the analysis of chert artifact color, chert flake tools were most likely produced from sources within the Belize River Valley. The only non-local variety of chert at Blackman Eddy was likely the patinated chert imported from Colha. Change in the percentage of patinated chert over

time was statistically significant and correlated to social change at Blackman Eddy. This increase in patinated chert over time was caused by the rise of Colha as a major chert production center in the eastern lowlands. Colha chert tools have been found in the Middle and Late Preclassic deposits at the sites of Cuello, Cerros, Barton Ramie, Cahal Pech, and Blackman Eddy. At all of the sites examined in this study, Colha chert never completely replaced the local production of chert tools using local sources. While Colha chert never dominated household economies at the sites examined here, it is possible that it was used as a type of gift given by elites to acquire social status and power from their constituents. As elite power grew over time, their ability to exchange for increasing amounts of chert from Colha would have grown, increasing the demand for Colha chert and chert tools over time.

Obsidian was another important resource exchanged at Blackman Eddy during the Middle Preclassic, Late Preclassic, and Classic periods. During the early Middle Preclassic, most of the obsidian came from the San Martin Jilotepeque (SMJ) source. During the Late Preclassic, obsidian from the El Chayal source was exchanged in greater quantity. By the Classic period, El Chayal obsidian dominated trade routes, supplemented by obsidian from the Ixtepeque source in Guatemala and obsidian central Mexico.

All of the obsidian tools found at Blackman Eddy were likely exchanged as finished products and were not produced locally. No obsidian by-products associated with the manufacture of obsidian flakes or prismatic blades have been found in deposits from Str. B1. However, the small amount of obsidian data from Blackman Eddy appears to support the idea that a shift in obsidian technology that occurred during the late Middle

Preclassic when obsidian flake tools production was supplanted by the production of obsidian prismatic blades.

Overall, social change at Blackman Eddy did not have as great an impact on the chipped stone tool industries as expected. Clearly, some chipped stone tool industries were more affected by social change than others. The reason for this difference is likely the different nature of the chipped stone industries. The chert flake and biface industries production were likely household activities where each household controlled the procurement, production, and use of chert tools, while the obsidian flake and prismatic blade industries were facilitated directly by the exchange networks of an emergent elite class.

Elites in prehistoric societies play a vital role in the emergence of complex economic activity, but they are also the primary beneficiaries of economic activity. These individuals consciously and strategically use economic activities to maintain social inequality, strengthen relationships with other elites, and create new institutions of control (Brumfiel and Earle 1987:3). Elite wealth is to finance a variety of activities, including the building of large structures and competitive gift giving. The emergence of an elite class at Blackman Eddy impacted the development of the obsidian chipped-stone tool industry because it helped facilitate both the importation of obsidian tools and the production of prismatic blades. The production of prismatic blades is generally beyond the means of the average household and may have required the financial resources of an elite chief to pay the costs associated with both the production and exchange of prismatic blades. Also, elites at Blackman Eddy would have had social ties to other important political centers which gave them increased access to exotic goods, such as obsidian,

from distant regions. If the exchange and production of obsidian tools used at Blackman Eddy was controlled by an elite class, there would be noticeable changes in obsidian artifact attributes that correlate with social change.

However, obsidian and Colha imports never completely replaced the local household production of chipped stone tools at Blackman Eddy. This means that individuals could perform essential daily tasks at the site without the use of obsidian or chert from Colha. If obsidian and Colha chert were non-essential items, then the power and prestige gained through these elite-sponsored activities may not have been all that great. Obsidian and chert from Colha were likely used by elites at Blackman Eddy as novelty items used to gain social debts that individuals could easily comply with when asked. These favors may have been “collected” by elites for the construction of larger public buildings at the site, but that appear does not appear to have been oppressive in terms of labor power employed in such tasks until the Classic period.

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Appendix

Raw Numbers and Weighted Average of Attributes

Raw Materials:

Raw Numbers

Raw Material	Obsidian	Chert	Quartz	Quartzite	Total
Episode 1	2	1277	21	8	1308
Episode 2	0	291	9	2	302
Episode 3	0	244	2	3	249
Episode 4	2	350	1	3	356
Episode 5	8	265	1	1	275
Episode 6	0	111	2	2	115
Episode 7	37	200	1	2	240
Total	49	2738	37	21	2845

Weighted Averages

Raw Material	Obsidian	Chert	Quartz	Quartzite	Total
Episode 1	0.15	97.63	1.61	0.61	100.00
Episode 2	0.00	96.36	2.98	0.66	100.00
Episode 3	0.00	97.99	0.80	1.20	100.00
Episode 4	0.56	98.31	0.28	0.84	100.00
Episode 5	2.91	96.36	0.36	0.36	100.00
Episode 6	0.00	96.52	1.74	1.74	100.00
Episode 7	15.42	83.33	0.42	0.83	100.00
Average	2.72	95.22	1.17	0.89	100.00

Chert Color:

Raw Numbers

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black	Total
Episode 1	417	120	110	299	79	11	1	239	1	1277
Episode 2	91	21	17	98	22	6	1	35	0	291
Episode 3	72	24	19	61	13	10	6	39	0	244
Episode 4	120	42	25	48	34	17	14	50	0	350
Episode 5	80	18	21	38	31	14	6	56	1	265
Episode 6	37	10	5	16	12	5	4	22	0	111
Episode 7	91	10	9	37	9	6	2	36	0	200
Total	908	245	206	597	200	69	34	477	2	2738

Weighted Averages

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black	Total
Episode 1	32.65	9.40	8.61	23.41	6.19	0.86	0.08	18.72	0.08	100.00
Episode 2	31.27	7.22	5.84	33.68	7.56	2.06	0.34	12.03	0.00	100.00
Episode 3	29.51	9.84	7.79	25.00	5.33	4.10	2.46	15.98	0.00	100.00
Episode 4	34.29	12.00	7.14	13.71	9.71	4.86	2.26	21.13	0.00	100.00
Episode 5	30.19	6.79	7.92	14.34	11.70	5.28	2.26	21.13	0.38	100.00
Episode 6	33.33	9.01	4.50	14.41	10.81	4.50	3.60	19.82	0.00	100.00
Episode 7	45.50	5.00	4.50	18.50	4.50	3.00	1.00	18.00	0.00	100.00
Average	33.82	8.46	6.62	20.44	7.97	3.52	1.72	18.12	0.07	100.00

Obsidian Color:

Total Number

Color	Black	Green	Total
Episode 1	2	0	2
Episode 2	0	0	0
Episode 3	0	0	0
Episode 4	8	0	8
Episode 5	2	0	2
Episode 6	0	0	0
Episode 7	35	2	37
Total	47	2	49

Weighted
Averages

Color	Black	Green	Total
Episode 1	100	0	100
Episode 2	0	0	0
Episode 3	0	0	0
Episode 4	100	0	100
Episode 5	0	0	0
Episode 6	0	0	0
Episode 7	94.59	5.41	100

Quartz Color:

Total Number

Color	Clear	White	Total
Episode 1	5	5	10
Episode 2	5	1	6
Episode 3	1	4	5
Episode 4	0	1	1
Episode 5	0	2	2
Episode 6	0	3	3
Episode 7	0	1	1
Total	11	17	28

Weighted
Averages

Color	Clear	White	Total
Episode 1	50.00	50.00	100.00
Episode 2	83.33	16.67	100.00
Episode 3	20.00	80.00	100.00
Episode 4	0.00	100.00	100.00
Episode 5	0.00	100.00	100.00
Episode 6	0.00	100.00	100.00
Episode 7	0.00	100.00	100.00
Average	21.90	78.10	100.00

Chert Translucence

Total Num

Translucence	Translucent	Opaque	Total
Episode 1	861	447	1308
Episode 2	202	100	302
Episode 3	131	118	249
Episode 4	163	193	356
Episode 5	160	115	275
Episode 6	86	29	115
Episode 7	154	86	240
Total	1757	1088	2845

Weighted
Averages

Translucence	Translucent	Opaque	Total
1	65.83	34.17	100.00
2	66.89	33.11	100.00
3	52.61	47.39	100.00
4	45.79	54.21	100.00
5	58.18	41.82	100.00
6	74.78	25.22	100.00
7	64.17	35.83	100.00
Average	428.24	271.76	700.00

Chert Technological Types:

Total Number

Technological Types	Flakes	Flake Fragments	Cores	Chunks	Fortuitous Blades	Bifaces	Bifacial Thinning Flakes	Adzes	Total
Episode 1	534	692	14	22	15	0	0	0	1277
Episode 2	92	159	24	10	2	2	2	0	291
Episode 3	106	115	5	16	2	0	0	0	244
Episode 4	181	147	6	13	0	2	1	0	350
Episode 5	111	144	4	5	1	0	0	0	265
Episode 6	53	44	2	10	2	0	0	0	111
Episode 7	77	106	4	5	1	6	0	1	200
Total	1154	1407	59	81	23	10	3	1	2738

Weighted
Averages

Technological Types	Flakes	Flake Fragments	Cores	Chunks	Fortuitous Blades	Bifaces	Bifacial Thinning Flakes	Adzes	Total
Episode 1	41.82	54.19	1.10	1.72	1.17	0.00	0.00	0.00	100.00
Episode 2	31.62	54.64	8.25	3.44	0.69	0.69	0.69	0.00	100.00
Episode 3	43.44	47.13	2.05	6.56	0.82	0.00	0.00	0.00	100.00
Episode 4	51.71	42.00	1.71	3.71	0.00	0.57	0.29	0.00	100.00
Episode 5	41.89	54.34	1.51	1.89	0.38	0.00	0.00	0.00	100.00
Episode 6	47.75	39.64	1.80	9.01	1.80	0.00	0.00	0.00	100.00
Episode 7	38.50	53.00	2.00	2.50	0.50	3.00	0.00	0.01	99.51
Average	42.39	49.28	2.63	4.12	0.77	0.61	0.14	0.00	99.93

Obsidian Technological Types

Total Number

Techno-logical Type	Flakes	Medial Prismatic Blades	Distal Prismatic Blades	Proximal Prismatic Blades	Cores	Chunks	Flake Fragments	Fortuitous Blades	Total
Episode 1	2	0	0	0	0	0	0	0	2
Episode 2	0	0	0	0	0	0	0	0	0
Episode 3	0	0	0	0	0	0	0	0	0
Episode 4	0	0	0	0	0	0	0	0	0
Episode 5	0	2	0	0	0	0	0	0	2
Episode 6	0	0	0	0	0	0	0	0	0
Episode 7	4	22	3	22	0	0	0	0	51
Total	6	24	3	22	0	0	0	0	55

Weighted Averages

Techno-logical Type	Flakes	Medial Prismatic Blades	Distal Prismatic Blades	Proximal Prismatic Blades	Cores	Chunks	Flake Fragments	Fortuitous Blades	Total
Episode 1	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Episode 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Episode 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Episode 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Episode 5	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Episode 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Episode 7	7.84	43.14	5.88	43.14	0.00	0.00	0.00	0.00	100.00
Average	15.41	20.45	0.84	6.16	0.00	0.00	0.00	0.00	42.86

Cortical Chert:

Total Number

Cortex	Present	Absent	Total
Episode 1	294	983	1277
Episode 2	69	222	291
Episode 3	89	155	244
Episode 4	123	227	350
Episode 5	94	171	265
Episode 6	43	68	111
Episode 7	55	145	200
Total	767	1971	2738

Weighted Averages

Cortex	Present	Absent	Total
Episode 1	23.02	76.98	100.00
Episode 2	23.71	76.29	100.00
Episode 3	36.48	63.52	100.00
Episode 4	35.14	64.86	100.00
Episode 5	35.47	64.53	100.00
Episode 6	38.74	61.26	100.00
Episode 7	27.50	72.50	100.00
Average	31.44	68.56	100.00

Chert Use Wear:

Total Number

Use-wear	Cut/sawing	Scraping	Engraving	Drilling	Total
Episode 1	84.00	16.00	26.00	3.00	129.00
Episode 2	24.00	6.00	15.00	1.00	46.00
Episode 3	17.00	0.00	3.00	4.00	24.00
Episode 4	28.00	12.00	1.00	2.00	43.00
Episode 5	37.00	9.00	4.00	0.00	50.00
Episode 6	11.00	4.00	2.00	0.00	17.00
Episode 7	11.00	4.00	1.00	0.00	16.00
Total	212.00	51.00	52.00	10.00	325.00

Weighted Averages

Use-wear	Cut/sawing	Scraping	Engraving	Drilling	Total
Episode 1	65.12	12.40	20.16	2.33	100.00
Episode 2	52.17	13.04	32.61	2.17	100.00
Episode 3	70.83	0.00	12.50	16.67	100.00
Episode 4	65.12	27.91	2.33	4.65	100.00
Episode 5	74.00	18.00	8.00	0.00	100.00
Episode 6	64.71	23.53	11.76	0.00	100.00
Episode 7	68.75	25.00	6.25	0.00	100.00
Average	65.81	17.13	13.37	3.69	100.00

Obsidian Use-wear:

Total Number

Use-wear	Cut/sawing	Scraping	Engraving	Drilling	Total
Episode 1	0	0	0	0	0
Episode 2	0	0	0	0	0
Episode 3	0	0	0	0	0
Episode 4	2	0	0	0	2
Episode 5	2	0	0	0	2
Episode 6	0	0	0	0	0
Episode 7	6	3	0	0	9
Total	10	3	0	0	13

Weighted Averages

Use-wear	Cut/sawing	Scraping	Engraving	Drilling	Total
Episode 1	0	0	0	0	0
Episode 2	0	0	0	0	0
Episode 3	0	0	0	0	0
Episode 4	100	0	0	0	100
Episode 5	100	0	0	0	100
Episode 6	0	0	0	0	0
Episode 7	66.67	33.33	0	0	100
Average	66.67	33.33	0.00	0.00	100.00

Thermal Alteration:

Total Number

Thermal Alteration	Present	Absent	Total
Episode 1	424	884	1308
Episode 2	138	164	302
Episode 3	120	129	249
Episode 4	127	229	356
Episode 5	87	188	275
Episode 6	44	71	115
Episode 7	74	166	240
Total	1014	1831	2845

Weighted
Averages

Thermal Alteration	Present	Absent	Total
Episode 1	32.42	67.58	100.00
Episode 2	45.70	54.30	100.00
Episode 3	48.19	51.81	100.00
Episode 4	35.67	64.33	100.00
Episode 5	31.64	68.36	100.00
Episode 6	38.26	61.74	100.00
Episode 7	30.83	69.17	100.00
Average	37.53	62.47	100.00

Chi-Square Calculations

Formula: $X^2 = (O - E)^2 / E$

Where: O = observed value
E = expected value

Raw Materials:

Total Number

Raw Material	Obsidian	Chert	Quartz	Quartzite	Total
Episode 1	2	1277	21	8	1308
Episode 2	0	291	9	2	302
Episode 3	0	244	2	3	249
Episode 4	2	350	1	3	356
Episode 5	8	265	1	1	275
Episode 6	0	111	2	2	115
Episode 7	37	200	1	2	240
Total	49	2738	37	21	2845

Expected Values

Raw Material	Obsidian	Chert	Quartz	Quartzite	Total
Episode 1	22.53	1258.81	17.01	9.65	1308.00
Episode 2	5.20	290.64	3.93	2.23	302.00
Episode 3	4.29	239.64	3.24	1.84	249.00
Episode 4	6.13	342.61	4.63	2.63	356.00
Episode 5	4.74	264.66	3.58	2.03	275.00
Episode 6	1.98	110.67	1.50	0.85	115.00
Episode 7	4.13	230.97	3.12	1.77	240.00
Total	49.00	2738.00	37.00	21.00	2845.00

(O-E)

Raw Material	Obsidian	Chert	Quartz	Quartzite
Episode 1	-20.53	18.19	3.99	-1.65
Episode 2	-5.20	0.36	5.07	-0.23
Episode 3	-4.29	4.36	-1.24	1.16
Episode 4	-4.13	7.39	-3.63	0.37
Episode 5	3.26	0.34	-2.58	-1.03
Episode 6	-1.98	0.33	0.50	1.15
Episode 7	32.87	-30.97	-2.12	0.23

(O-E)²

Raw Material	Obsidian	Chert	Quartz	Quartzite
Episode 1	421.40	331.01	15.91	2.74
Episode 2	27.05	0.13	25.73	0.05
Episode 3	18.39	19.05	1.53	1.35
Episode 4	17.07	54.60	13.18	0.14
Episode 5	10.65	0.12	6.64	1.06
Episode 6	3.92	0.11	0.25	1.33
Episode 7	1080.20	959.37	4.50	0.05

Raw Materials (Cont.):

$(O-E)^2 / E$

Raw Material	Obsidian	Chert	Quartz	Quartzite
Episode 1	18.71	0.26	0.94	0.28
Episode 2	5.20	0.00	6.55	0.02
Episode 3	4.29	0.08	0.47	0.73
Episode 4	2.78	0.16	2.85	0.05
Episode 5	2.25	0.00	1.86	0.52
Episode 6	1.98	0.00	0.17	1.56
Episode 7	261.32	4.15	1.44	0.03
Chi-Square	296.53	4.66	14.27	3.21

$V = 6; \infty = 0.05$

Chi-Square Calculations for Chert Colors:

Color (O)	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black	Total
Episode 1	417	120	110	299	79	11	1	239	1	1277
Episode 2	91	21	17	98	22	6	1	35	0	291
Episode 3	72	24	19	61	13	10	6	39	0	244
Episode 4	120	42	25	48	34	17	14	50	0	350
Episode 5	80	18	21	38	31	14	6	56	1	265
Episode 6	37	10	5	16	12	5	4	22	0	111
Episode 7	91	10	9	37	9	6	2	36	0	200
Total	908	245	206	597	200	69	34	477	2	2738

Expected
Values

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black
Episode 1	431.89	108.09	84.49	260.98	101.79	45.00	21.91	231.34	0.83
Episode 2	98.42	24.63	19.25	59.47	23.20	10.25	4.99	52.72	0.19
Episode 3	82.52	20.65	16.14	49.87	23.20	8.60	4.19	44.20	0.16
Episode 4	118.37	29.63	23.16	71.53	27.90	12.33	6.01	63.41	0.23
Episode 5	89.62	22.43	17.53	54.16	21.12	9.34	4.55	48.01	0.17
Episode 6	37.54	9.40	7.34	22.69	8.85	3.91	1.90	20.11	0.07
Episode 7	67.64	16.93	13.23	40.87	15.94	7.05	3.43	36.23	0.13
Total	926.00	231.76	181.16	559.57	221.99	96.48	46.99	496.01	1.78

(O-E)

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black
Episode 1	-14.89	11.91	25.51	38.02	-22.79	-34.00	-20.91	7.66	0.17
Episode 2	-7.42	-3.63	-2.25	38.53	-1.20	-4.25	-3.99	-17.72	-0.19
Episode 3	-10.52	3.35	2.86	11.13	-10.20	1.40	1.81	-5.20	-0.16
Episode 4	1.63	12.37	1.84	-23.53	6.10	4.67	7.99	-13.41	-0.23
Episode 5	-9.62	-4.43	3.47	-16.16	9.88	4.66	1.45	7.99	0.83
Episode 6	-0.54	0.60	-2.34	-6.69	3.15	1.09	2.10	1.89	-0.07
Episode 7	23.36	-6.93	-4.23	-3.87	-6.94	-1.05	-1.43	-0.23	-0.13

(O-E)²

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black
Episode 1	221.57	141.83	650.70	1445.41	519.42	1155.89	437.43	58.69	0.03
Episode 2	55.01	13.19	5.08	1484.41	1.43	18.10	15.95	313.89	0.04
Episode 3	110.70	11.20	8.16	123.96	103.96	1.97	3.29	27.07	0.03
Episode 4	2.65	153.13	3.40	553.65	37.22	21.78	63.90	179.70	0.05
Episode 5	92.62	19.63	12.02	261.09	97.55	21.73	2.11	63.89	0.68
Episode 6	0.29	0.37	5.50	44.69	9.94	1.19	4.39	3.58	0.01
Episode 7	545.66	48.01	17.92	15.01	48.19	1.10	2.05	0.05	0.02

(O-E)²/E

Color	Caramel	Chocolate	Gray	Red	Gray-white	White	Tan	Tan-white	Black
Episode 1	0.51	1.31	7.70	5.54	5.10	25.69	19.96	0.25	0.03
Episode 2	0.56	0.54	0.26	24.96	0.06	1.76	3.19	5.95	0.19
Episode 3	1.34	0.54	0.51	2.49	4.48	0.23	0.78	0.61	0.16
Episode 4	0.02	5.17	0.15	7.74	1.33	1.77	10.64	2.83	0.23
Episode 5	1.03	0.88	0.69	4.82	4.62	2.33	0.46	1.33	3.97
Episode 6	0.01	0.04	0.75	1.97	1.12	0.30	2.30	0.18	0.07
Episode 7	8.07	2.84	1.35	0.37	3.02	0.16	0.60	0.00	0.13
Chi-Square	11.54	11.31	11.40	47.88	19.74	32.23	37.94	11.16	4.78

V = 6; ∞ = 0.05

Chi-Square Calculations for Translucent Chert Artifacts:

Translucence	Present (O)	Absent	Total	Expected Value (E)	(O-E)	(O-E) ²	(O-E) ² /E
Episode 1	849	428	1277	736.96	112.04	12552.96	17.03
Episode 2	194	97	291	167.94	26.06	679.12	4.04
Episode 3	135	109	244	140.81	-5.81	33.76	0.24
Episode 4	196	154	350	201.99	-5.99	35.88	0.18
Episode 5	122	143	265	152.93	-30.93	956.66	6.26
Episode 6	61	50	111	64.06	-3.06	9.36	0.15
Episode 7	117	83	200	115.42	1.58	2.50	0.02
Total	1674	1064	2738			Chi-Square =	27.92

V = 6; ∞ = 0.05

Chi-Square Calculations for Patinated Chert Artifacts:

Construction Episode	Patinated (O)	Non-patinated	Total	Expected Value (E)	(O-E)	(O-E) ²	(O-E) ² /E
Episode 1	29	1279	1308	138.85	-109.85	12067.02	86.91
Episode 2	34	268	302	32.06	1.94	3.76	0.12
Episode 3	36	213	249	26.43	9.54	91.01	3.44
Episode 4	104	252	356	37.79	66.21	4383.76	116.00
Episode 5	50	225	275	29.19	20.81	433.06	14.83
Episode 6	40	75	115	12.21	27.79	772.28	63.26
Episode 7	9	231	240	25.48	-16.48	271.59	10.66
Total	302	2543	2845	302.00		Chi-Square =	295.23

V = 6; $\infty = 0.05$

Chi-Square Calculations for Cortical Chert Artifacts:

Construction Episode	Present (O)	Absent	Total	Expected Values (E)	(O-E)	(O-E) ²	(O-E) ² /E
Episode 1	294	983	1277	401.96	270.98	73430.16	182.68
Episode 2	69	222	291	91.48	45.29	2051.18	22.42
Episode 3	89	155	244	76.71	52.52	2758.35	35.96
Episode 4	123	227	350	110.03	87.86	7719.38	70.16
Episode 5	94	171	265	83.31	58.53	3425.76	41.12
Episode 6	43	68	111	34.90	4.26	18.15	0.52
Episode 7	55	145	200	62.88	27.50	756.25	12.03
Total	767	1971	2738			Chi-Square =	364.89

V = 6; $\infty = 0.05$

Chi-Square Calculations for Thermally-altered Chert Artifacts:

Construction Episode	Present (O)	Absent	Total	Expected Values (E)	(O-E)	(O-E) ²	(O-E) ² /E
Episode 1	294	983	1277	401.96	270.98	73430.16	182.68
Episode 2	69	222	291	91.48	45.29	2051.18	22.42
Episode 3	89	155	244	76.71	52.52	2758.35	35.96
Episode 4	123	227	350	110.03	87.86	7719.38	70.16
Episode 5	94	171	265	83.31	58.53	3425.76	41.12
Episode 6	43	68	111	34.90	4.26	18.15	0.52
Episode 7	55	145	200	62.88	27.50	756.25	12.03
Total	767	1971	2738			Chi-Square =	364.89

V = 6; $\infty = 0.05$

Chi-Square Calculations for Chert Artifacts with Use-wear:

Use-wear	Cut/sawing	Scraping	Engraving	Drilling	Total
Episode 1	84.00	16.00	26.00	3.00	129.00
Episode 2	24.00	6.00	15.00	1.00	46.00
Episode 3	17.00	0.00	3.00	4.00	24.00
Episode 4	28.00	12.00	1.00	2.00	43.00
Episode 5	37.00	9.00	4.00	0.00	50.00
Episode 6	11.00	4.00	2.00	0.00	17.00
Episode 7	11.00	4.00	1.00	0.00	16.00
Total	212.00	51.00	52.00	10.00	325.00

Expected Values

Use-wear (E)	Cut/sawing	Scraping	Engraving	Drilling
Episode 1	84.90	22.09	17.25	4.76
Episode 2	30.27	7.88	6.15	1.70
Episode 3	15.80	4.11	3.21	0.89
Episode 4	28.30	7.36	5.75	1.59
Episode 5	32.91	8.56	6.69	1.84
Episode 6	11.19	2.91	2.27	0.63
Episode 7	10.53	2.74	2.14	0.59

Chi-Square Calculations for Chert Artifacts with Use-wear (Cont.):

(O-E)

Use-wear	Cut/sawing	Scraping	Engraving	Drilling
Episode 1	-0.90	-6.09	8.75	-1.76
Episode 2	-6.27	-1.88	8.85	-0.70
Episode 3	1.20	-4.11	-0.21	3.11
Episode 4	-0.30	4.64	-4.75	0.41
Episode 5	4.09	0.44	-2.69	-1.84
Episode 6	-0.19	1.09	-0.27	-0.63
Episode 7	0.47	1.26	-1.14	-0.59

(O-E)²

Use-wear	Cut/sawing	Scraping	Engraving	Drilling
Episode 1	0.81	37.12	76.56	3.09
Episode 2	39.37	3.53	78.30	0.49
Episode 3	1.45	16.89	0.04	9.70
Episode 4	0.09	21.49	22.56	0.17
Episode 5	16.75	0.19	7.21	3.40
Episode 6	0.04	1.18	0.07	0.39
Episode 7	0.22	1.59	1.30	0.35

(O-E)²/E

Use-wear	Cut/sawing	Scraping	Engraving	Drilling
Episode 1	0.01	1.68	4.44	0.65
Episode 2	1.30	0.45	12.73	0.29
Episode 3	0.09	4.11	0.01	10.96
Episode 4	0.00	2.92	3.92	0.11
Episode 5	0.51	0.02	1.08	1.84
Episode 6	0.00	0.41	0.03	0.63
Episode 7	0.02	0.58	0.61	0.59
Chi-Square	1.94	10.16	22.82	15.07

V = 6; $\alpha = 0.05$

Key Codes for Index of Artifacts from Blackman Eddy

Raw Material

C = Chert
O = Obsidian
X = Quartzite
Q = Quartz

Use-wear

C = Cut
S = Scrape
D = Drill
E = Engrave

Translucence

O = Opaque
T = Translucent

Technological Type

A = Adze
B = Biface
C = Core
F = Flake
FF = Flake Fragment
FB = Fortuitous Blade
H = Hammerstone
HF = Hammerstone Flake
K = Chunk
MPB = Medial Prismatic Blade
PPB = Proximal Prismatic Blade
DPB = Distal Prismatic Blade

Color

C = Caramel
D = Chocolate
R = Red
X = Gray
Z = White
W = Gray-white
T = Tan
X = Tan-white
B = Black
G = Green

Number	Lot Number	Structure	Raw Material	Color	Trans-luence	Thermal Alteration	Patination	Cortex	Length	Width	Thickness	Weight	Edge Wear	Techno-logical Type	Size	
1	19D-6-0000	B1-02	C	X	O	No	No	No				36		F	3	
3	19D-6-0000	B1-02	C	C	T	No	No	No				8		FF	2	
4	19D-6-0000	B1-02	C	X	T	No	No	No				6		F	3	
5	19D-6-0000	B1-02	C	C	T	No	No	No				6		FF	2	
6	19D-6-0000	B1-02	C	C	T	No	No	No				3		FF	2	
7	19D-6-0000	B1-02	C	C	T	No	No	No				3		FF	2	
8	19D-6-0000	B1-02	C	X	O	No	No	No				8		F	2	
9	19D-6-0000	B1-02	C	C	O	No	No	No				3		F	2	
10	19D-6-0000	B1-02	C	C	T	No	No	No				0.5		FF	2	
11	19D-6-0000	B1-02	C	X	O	No	No	No				5		F	2	
12	19D-6-0000	B1-02	C	C	O	No	No	No				0.5		FF	2	
13	19D-6-0000	B1-02	C	C	O	No	No	No				2		FF	2	
14	19D-6-0000	B1-02	C	C	O	No	No	No				0.5		FF	1	
15	19D-6-0000	B1-02	C	C	T	No	No	No				3		FF	3	
17	19D-6-0000	B1-02	C	X	T	No	No	No				3	C	FF	2	
18	19D-6-0000	B1-02	C	C	O	No	No	No				2	C	FF	2	
19	15N-21-0000	B1-03-A	C	C	T	No	No	No	51.46	11.62	14.21	17	C	F	4	
21	20A-21-1045	B1-13	O	B	T	No	No	No	19	15		2	0.5	MPB	2	
22	20A-21-1046	B1-08	Q	C	T	No	No	No				4		FF	2	
23	20D-18-1057	B1-08	C	C	T	No	No	No	24	6		5	0.5	D	FF	2
24	20A-22-1064	B1-13	C	C	T	No	No	No	41	11		5	2	D	FF	3
26	20A-21-1056	B1-08	C	X	O	No	No	No	27	8		3	0.5	D	FF	2
27	20A-21-1056	B1-08	C	C	T	No	No	No				0.5		FF	2	
28	20A-21-1056	B1-08	C	C	T	No	No	No				0.5		FF	2	
30	20D-19-1058	B1-08	C	R	T	No	No	No				5		FF	2	
31	20D-19-1058	B1-08	C	R	T	No	No	No				0.5		FF	2	
33	20A-21-1050	B1-08	C	X	O	No	No	No	60	43		57	50	B	4	
35	19D-6-0000	B1-02	C	C	T	No	No	No				26		F	4	
38	15N-21-0000	B1-03-A	C	X	O	No	No	No				15		F	2	
42	15N-22-0000	B1-03-C	C	X	T	No	No	No				8		F	2	
44	15N-23-0000	B1-02	C	X	O	No	No	No				8		F	2	
46	19D-9-0000	B1-02	L	Z	O	No	No	No				788		C	4	
50	19D-9-0000	B1-02	C	X	T	No	No	No				9		F	2	
51	19D-9-0000	B1-02	C	X	O	No	No	No				14		F	2	
52	19D-9-0000	B1-02	C	X	O	No	No	No	33.83	32.7		7.97	8	C	F	2
53	19D-9-0000	B1-02	C	X	O	No	No	No				5		FF	3	
54	19D-9-0000	B1-02	C	X	O	No	No	No				6		F	3	
55	19D-9-0000	B1-02	C	X	T	No	No	No				4		F	2	
56	19D-9-0000	B1-02	C	X	T	No	No	No				3		F	2	
57	19D-9-0000	B1-02	C	X	O	No	No	No				7		F	2	
60	19D-9-0000	B1-02	C	C	T	No	No	No				107		C	4	
83	19D-9-0000	B1-02	C	D	T	No	No	No				2		FF	1	
86	19D-9-0000	B1-02	C	C	O	No	No	No				24		FF	2	
88	19D-9-0000	B1-02	C	C	T	No	No	No	45.47	40.14		12.15	20	C	F	2
90	19D-9-0000	B1-02	C	C	T	No	No	No				11		F	3	
92	19D-9-0000	B1-02	C	C	T	No	No	No				2		F	2	
93	19D-9-0000	B1-02	C	C	T	No	No	No	40.01	30.76		6.6	6	C	FF	2
94	19D-9-0000	B1-02	C	C	T	No	No	No				1		F	2	
95	19D-9-0000	B1-02	C	C	T	No	No	No				4		FF	2	

96	19D-9-0000	B1-02	C	C	T	No	No	No				3		F	2
97	19D-9-0000	B1-02	C	C	O	No	No	No				8		F	2
100	19D-9-0000	B1-02	C	C	T	No	No	No				9		F	2
102	19D-9-0000	B1-02	C	C	T	No	No	No				2		FF	2
103	19D-9-0000	B1-02	C	C	T	No	No	No				7		FF	2
105	19D-9-0000	B1-02	C	C	O	No	No	No				7		FF	2
106	19D-9-0000	B1-02	C	C	T	No	No	No				0.5		F	2
107	19D-9-0000	B1-02	C	C	T	No	No	No				2		F	2
108	19D-9-0000	B1-02	C	C	T	No	No	No				4		F	2
109	19D-9-0000	B1-02	C	C	O	No	No	No				4		F	2
112	19D-9-0000	B1-02	C	C	T	No	No	No				3		FF	2
113	19D-9-0000	B1-02	C	C	T	No	No	No				3		FF	2
115	19D-9-0000	B1-02	C	C	T	No	No	No				2		FF	1
118	19D-9-0000	B1-02	C	C	T	No	No	No				2		FF	1
119	19D-9-0000	B1-02	C	C	T	No	No	No	25.71	21.17	6.78	5	S	F	2
120	19D-9-0000	B1-02	C	C	T	No	No	No				55		K	4
138	19D-9-0000	B1-02	C	Z	O	No	No	No	64.78	37	14.89	29	S	F	4
139	19D-9-0000	B1-02	C	Z	O	No	No	No				4		FF	2
141	19D-9-0000	B1-02	C	C	T	No	No	No	28.37	22.25	8.43	4	C	FF	2
142	19D-9-0000	B1-02	C	Z	O	No	No	No				2		FF	2
144	19D-9-0000	B1-02	C	C	T	No	No	No				3		FF	2
145	19D-9-0000	B1-02	C	C	T	No	No	No				0.5		FF	2
146	19D-9-0000	B1-02	C	C	T	No	No	No				0.5		FF	2
148	19D-9-0000	B1-02	C	C	T	No	No	No				9		F	2
150	19D-9-0000	B1-02	C	C	T	No	No	No				0.5		F	1
152	19D-9-0000	B1-02	C	X	T	No	No	No				1		FF	1
153	19D-9-0000	B1-02	C	C	T	No	No	No				0.5		FF	1
154	19D-9-0000	B1-02	C	C	T	No	No	No				0.5		F	1
155	19D-9-0000	B1-02	C	X	T	No	No	No				0.5		FF	1
156	19D-9-0000	B1-02	C	D	T	No	No	No				4		F	2
157	19D-9-0000	B1-02	C	D	T	No	No	No				4		F	2
160	19D-9-0000	B1-02	C	D	O	No	No	No				3		FF	2
163	19D-9-0000	B1-02	C	W	T	No	No	No				5		FF	2
166	19D-9-0000	B1-02	C	W	O	No	No	No				14		FF	4
167	19D-9-0000	B1-02	C	W	O	No	No	No				4		FF	2
169	19D-6-0000	B1-02	C	C	T	No	No	No				87		K	4
170	19D-6-0000	B1-02	C	Z	O	No	No	No				50		K	4
171	19D-6-0000	B1-02	C	D	T	No	No	No				21		FF	4
176	19D-6-0000	B1-02	C	X	T	No	No	No				2		FF	2
177	19D-18-0000	B1-08	C	D	T	No	No	No				158		C	4
178	19D-18-0000	B1-08	Q	Z	T	No	No	No				2		FF	2
179	19D-18-0000	B1-08	Q	Z	T	No	No	No				3		FF	2
180	19D-18-0000	B1-08	C	X	T	No	No	No				2		F	2
181	19D-18-0000	B1-08	C	X	T	No	No	No				2		F	2
182	19D-18-0000	B1-08	C	X	T	No	No	No				3		FF	2
183	19D-18-0000	B1-08	C	X	O	No	No	No				8		F	2
185	19D-18-0000	B1-08	C	G	O	No	No	No				0.5		FF	1
186	19D-18-0000	B1-08	C	D	O	No	No	No				7		K	2
187	19D-18-0000	B1-08	C	W	T	No	No	No				3		FF	2
188	19D-18-0000	B1-08	C	W	T	No	No	No				2		FF	2
189	19D-18-0000	B1-08	C	W	T	No	No	No				7		FF	3
190	19D-18-0000	B1-08	C	X	O	No	No	No				66		F	4
200	19D-18-0000	B1-08	C	C	T	No	No	No				7		FF	2
210	19D-18-0000	B1-08	C	C	T	No	No	No				12		F	3

211	19D-18-0000	B1-08	C	C	T	No	No	No				30		F	4
212	19D-18-0000	B1-08	C	C	T	No	No	No	31.73	19.58	6.2	4	C	F	2
215	19D-18-0000	B1-08	C	C	T	No	No	No	31.89	27.01	14.33	9	S	FF	3
216	19D-18-0000	B1-08	C	C	T	No	No	No				1		FF	2
217	19D-18-0000	B1-08	C	D	T	No	No	No				38		F	4
219	19D-18-0000	B1-08	C	C	T	No	No	No				16		F	3
220	19D-18-0000	B1-08	C	C	T	No	No	No	36.53	35.59	10.01	9	C	F	3
221	19D-18-0000	B1-08	C	C	T	No	No	No				5		B	3
224	19D-18-0000	B1-08	C	C	T	No	No	No				5		FF	2
225	19D-18-0000	B1-08	C	C	T	No	No	No				5		B	3
226	19D-18-0000	B1-08	C	C	T	No	No	No				2		FF	2
227	19D-18-0000	B1-08	C	C	T	No	No	No				1		FF	2
228	19D-18-0000	B1-08	C	C	T	No	No	No				1		FF	2
229	19D-18-0000	B1-08	C	C	O	No	No	No				1		FF	2
230	19D-18-0000	B1-08	C	C	O	No	No	No				4		FF	2
231	19D-18-0000	B1-08	C	C	O	No	No	No				2		F	2
232	19D-18-0000	B1-08	C	C	O	No	No	No				17		K	3
235	20I-10-0000	B1-12	C	C	T	No	No	No	23.48	12.62	3.19	1	C	F	2
236	20I-10-0000	B1-12	C	C	O	No	No	No				5		F	3
239	20I-10-0000	B1-12	C	C	T	No	No	No				4		F	2
242	20I-10-0000	B1-12	C	G	O	No	No	No				2		FF	2
243	20I-10-0000	B1-12	C	X	T	No	No	No				6		FF	2
244	20I-10-0000	B1-12	C	X	O	No	No	No	26.39	16.5	5.63	2	C	F	2
246	20I-10-0000	B1-12	Q	Z	O	No	No	No				7		HF	2
258	20I-9-0000	B1-12	C	X	O	No	No	No				3		F	2
259	20I-9-0000	B1-12	C	X	O	No	No	No				3		FF	2
260	20I-9-0000	B1-12	C	X	O	No	No	No				3		FF	2
261	20I-9-0000	B1-12	C	X	O	No	No	No				0.5		FF	2
262	20I-9-0000	B1-12	C	X	O	No	No	No				3		FF	2
263	20I-9-0000	B1-12	Q	Z	O	No	No	No				0.5		FF	1
266	20I-9-0000	B1-12	C	C	T	No	No	No	30.32	29.11	6.87	5	C	F	2
267	20I-9-0000	B1-12	C	C	T	No	No	No				2		F	2
268	20I-9-0000	B1-12	C	C	T	No	No	No				11		K	3
269	20I-9-0000	B1-12	C	C	T	No	No	No				3		F	2
270	20I-9-0000	B1-12	C	C	T	No	No	No				3		F	2
271	20I-9-0000	B1-12	C	C	T	No	No	No				0.5		FF	2
273	20I-9-0000	B1-12	C	C	T	No	No	No				8		FF	2
274	20I-9-0000	B1-12	C	C	T	No	No	No				4		K	2
275	20I-9-0000	B1-12	C	C	T	No	No	No	32.19	10.6	2.54	0.5	C	F	2
276	20I-9-0000	B1-12	C	C	T	No	No	No				2		F	2
277	20I-9-0000	B1-12	C	C	T	No	No	No				2		FF	2
278	20I-9-0000	B1-12	C	C	T	No	No	No				0.5		FF	1
279	20I-9-0000	B1-12	C	C	O	No	No	No				0.5		FF	2
280	20I-9-0000	B1-12	C	C	O	No	No	No				2		FF	2
281	20I-7-0000	B1-12	C	W	O	No	No	No				148		F	4
282	20I-7-0000	B1-12	Q	Z	O	No	No	No				48		F	4
283	20I-7-0000	B1-12	Q	Z	O	No	No	No				4		F	2
284	20I-7-0000	B1-12	Q	Z	O	No	No	No				123		H	4
286	20I-7-0000	B1-12	C	C	T	No	No	No	65.12	46.28	11.57	34	C	F	4
288	20I-7-0000	B1-12	C	C	T	No	No	No				3		F	2
289	20I-7-0000	B1-12	C	C	T	No	No	No				0.5		F	2
291	20I-7-0000	B1-12	C	C	T	No	No	No				5		F	3
293	20I-7-0000	B1-12	C	D	T	No	No	No				9		F	3
306	20I-4-0000	B1-12	C	C	T	No	No	No				10		F	4

307	20I-4-0000	B1-12	C	C	T	No	No	No				5		FF	2
308	20I-4-0000	B1-12	C	C	T	No	No	No				8		F	2
309	20I-4-0000	B1-12	C	D	O	No	No	No				6		FF	3
310	20I-4-0000	B1-12	C	D	O	No	No	No				2		FF	2
312	20I-4-0000	B1-12	C	C	T	No	No	No	52.87	29.66	8.76	9	C	F	4
313	20I-4-0000	B1-12	C	C	T	No	No	No				2		FF	2
314	20I-4-0000	B1-12	C	X	O	No	No	No				3		F	2
315	20I-4-0000	B1-12	C	X	O	No	No	No				8		F	3
316	20I-4-0000	B1-12	C	X	O	No	No	No	36.19	28.34	7.74	8	C	F	3
317	20I-4-0000	B1-12	Q	Z	T	No	No	No				1		F	2
318	20I-4-0000	B1-12	C	C	T	No	No	No				1		F	1
320	20I-6-0000	B1-12	C	W	O	No	No	No				1		FF	2
45	15N-23-0000	B1-02	C	R	O	Yes	No	No	31.88	18.85	12.04	6	C	FF	2
62	19D-9-0000	B1-02	C	R	T	Yes	No	No				15		F	2
67	19D-9-0000	B1-02	C	R	T	Yes	No	No				7		FF	2
68	19D-9-0000	B1-02	C	R	O	Yes	No	No				13		FF	3
72	19D-9-0000	B1-02	C	R	T	Yes	No	No				6		F	2
73	19D-9-0000	B1-02	C	R	O	Yes	No	No				5		FF	2
74	19D-9-0000	B1-02	C	R	T	Yes	No	No				4		FF	2
75	19D-9-0000	B1-02	C	G	O	Yes	No	No				7		FF	2
80	19D-9-0000	B1-02	C	R	T	Yes	No	No				5		F	2
82	19D-9-0000	B1-02	C	G	O	Yes	No	No				8		F	2
85	19D-9-0000	B1-02	C	R	O	Yes	No	No				10		FF	3
123	19D-9-0000	B1-02	C	R	O	Yes	No	No				5		F	2
124	19D-9-0000	B1-02	C	R	O	Yes	No	No				0.5		FF	2
125	19D-9-0000	B1-02	C	G	O	Yes	No	No				3		FF	2
126	19D-9-0000	B1-02	C	R	O	Yes	No	No				2		F	2
127	19D-9-0000	B1-02	C	R	T	Yes	No	No				3		FF	2
128	19D-9-0000	B1-02	C	Z	O	Yes	No	No	48.16	23.33	3.79	6	C	FF	4
129	19D-9-0000	B1-02	C	X	O	Yes	No	No				3		F	2
130	19D-9-0000	B1-02	C	R	O	Yes	No	No				2		FF	2
131	19D-9-0000	B1-02	C	R	O	Yes	No	No				0.5		FF	2
133	19D-9-0000	B1-02	C	R	T	Yes	No	No				0.5		FF	1
134	19D-9-0000	B1-02	C	R	T	Yes	No	No				0.5		FF	1
147	19D-9-0000	B1-02	C	C	T	Yes	No	No				2		FF	2
164	19D-9-0000	B1-02	C	W	O	Yes	No	No				0.5		FF	2
165	19D-9-0000	B1-02	C	W	O	Yes	No	No				1		FF	2
168	19D-9-0000	B1-02	C	W	O	Yes	No	No				0.5		FF	1
175	19D-6-0000	B1-02	C	R	T	Yes	No	No				3		FF	2
194	19D-18-0000	B1-08	C	R	T	Yes	No	No				7		FF	3
196	19D-18-0000	B1-08	C	R	T	Yes	No	No				10		FF	3
199	19D-18-0000	B1-08	C	W	O	Yes	No	No				7		FF	3
201	19D-18-0000	B1-08	C	W	O	Yes	No	No				2		F	2
202	19D-18-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
203	19D-18-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
205	19D-18-0000	B1-08	C	R	T	Yes	No	No				1		F	1
207	19D-18-0000	B1-08	C	E	O	Yes	No	No				1		FF	2
213	19D-18-0000	B1-08	C	C	T	Yes	No	No				4		FF	2
222	19D-18-0000	B1-08	C	C	T	Yes	No	No				11		F	3
245	20I-10-0000	B1-12	C	R	T	Yes	No	No				10		FF	3
249	20I-9-0000	B1-12	C	B	O	Yes	No	No	35.59	21.75	4.72	3	D	FF	3
250	20I-9-0000	B1-12	C	B	O	Yes	No	No				4		FF	2
251	20I-9-0000	B1-12	C	R	T	Yes	No	No				1		F	2
253	20I-9-0000	B1-12	C	R	T	Yes	No	No				0.5		FF	1

254	20I-9-0000	B1-12	C	R	T	Yes	No	No				0.5		FF	2
272	20I-9-0000	B1-12	C	C	T	Yes	No	No	25.99	21.16	9.41	4	C	FF	2
296	20I-4-0000	B1-12	C	R	T	Yes	No	No				9		F	3
298	20I-4-0000	B1-12	C	R	T	Yes	No	No				3		FF	2
299	20I-4-0000	B1-12	C	R	O	Yes	No	No	30.01	16.17	3.48	2	C	FF	2
302	20I-4-0000	B1-12	C	X	O	Yes	No	No				7		F	3
303	20I-4-0000	B1-12	C	C	O	Yes	No	No				5		FF	2
304	20I-4-0000	B1-12	C	C	T	Yes	No	No	17.15	7.79	2.54	0.5		FF	1
323	20I-6-0000	B1-12	C	W	T	No	No	No				0.5		FF	1
324	20I-6-0000	B1-12	C	W	T	No	No	No	18.72	16.59	7.52	2	C	FF	1
325	20I-6-0000	B1-12	C	D	T	No	No	No				4		FF	3
327	20I-6-0000	B1-12	C	D	T	No	No	No				2		F	2
328	20I-6-0000	B1-12	C	D	T	No	No	No				16		F	4
330	20I-6-0000	B1-12	C	X	O	No	No	No	45.22	44.22	12.12	28	C	F	4
331	20I-6-0000	B1-12	C	X	T	No	No	No				10		FF	3
334	20I-6-0000	B1-12	C	X	T	No	No	No				0.5		FF	2
335	20I-6-0000	B1-12	C	X	T	No	No	No				0.5		FF	2
336	20I-6-0000	B1-12	C	X	T	No	No	No				0.5		FF	2
337	20I-6-0000	B1-12	C	X	T	No	No	No				0.5		FF	1
338	20I-6-0000	B1-12	C	X	T	No	No	No				2		F	2
339	20I-6-0000	B1-12	C	X	T	No	No	No				1		FF	2
340	20I-6-0000	B1-12	C	C	T	No	No	No				4		F	2
342	20I-6-0000	B1-12	C	C	T	No	No	No				5		FF	2
345	20I-6-0000	B1-12	C	C	T	No	No	No	42.07	27.62	7.86	7	C	F	3
346	20I-6-0000	B1-12	C	C	T	No	No	No	24.24	17.82	5.61	2	C	F	2
349	20I-6-0000	B1-12	C	C	T	No	No	No				2		F	2
351	20I-6-0000	B1-12	C	C	T	No	No	No	27.92	15.28	8.07	2	C	FF	2
352	20I-6-0000	B1-12	C	C	T	No	No	No				3		FF	2
353	20I-6-0000	B1-12	C	C	T	No	No	No	21.84	16.9	5.2	2	C	FF	2
354	20I-6-0000	B1-12	C	C	T	No	No	No				2		FF	1
355	20I-6-0000	B1-12	C	X	T	No	No	No				4		F	2
378	20I-11-0000	B1-12	C	X	O	No	No	No				0.5		FF	1
380	20I-11-0000	B1-12	C	D	O	No	No	No	47.74	30.46	13.5	14	C	F	3
395	20I-11-0000	B1-12	C	C	O	No	No	No				55		F	4
398	20I-11-0000	B1-12	C	D	T	No	No	No	34.67	23.83	6.4	5	C	F	3
400	20I-11-0000	B1-12	C	C	T	No	No	No				13		F	3
404	20I-11-0000	B1-12	C	C	T	No	No	No				2		FF	2
405	20I-11-0000	B1-12	C	C	T	No	No	No				3		F	2
407	20I-11-0000	B1-12	C	X	O	No	No	No				4		FF	2
409	20I-11-0000	B1-12	C	C	O	No	No	No				0.5		FF	1
412	20I-11-0000	B1-12	Q	Z	T	No	No	No				3		F	1
414	20I-11-0000	B1-12	C	C	O	No	No	No				8		F	3
415	20I-11-0000	B1-12	C	C	O	No	No	No				2		F	2
416	20I-11-0000	B1-12	C	C	O	No	No	No				1		FF	1
417	20I-11-0000	B1-12	C	X	O	No	No	No				3		FF	1
418	20I-11-0000	B1-12	C	X	O	No	No	No				4		FF	1
420	20I-11-0000	B1-12	C	W	O	No	No	No				0.5		FF	1
421	20I-11-0000	B1-12	C	W	O	No	No	No				2		FF	2
422	20I-11-0000	B1-12	C	W	O	No	No	No				2		F	2
424	20I-11-0000	B1-12	C	C	O	No	No	No				2		F	2
437	20I-11-0000	B1-12	Q	Z	O	No	No	No				7		F	2
438	20I-11-0000	B1-12	Q	Z	O	No	No	No				7		F	3
439	20I-11-0000	B1-12	Q	Z	O	No	No	No				3		FF	2
440	20I-11-0000	B1-12	C	W	O	No	No	No				3		F	2

441	20I-11-0000	B1-12	C	W	O	No	No	No					1		FF	1
442	20I-11-0000	B1-12	C	C	O	No	No	No					12		F	2
443	20I-11-0000	B1-12	C	C	T	No	No	No					4		F	2
444	20I-11-0000	B1-12	C	C	T	No	No	No					9		F	3
445	20I-11-0000	B1-12	C	C	O	No	No	No					2		FF	2
446	20I-11-0000	B1-12	C	C	T	No	No	No					1		FF	2
447	20I-11-0000	B1-12	C	C	O	No	No	No					3		FF	2
448	20I-11-0000	B1-12	C	C	T	No	No	No					1		FF	2
449	20I-11-0000	B1-12	C	C	T	No	No	No					1		FF	2
450	20I-11-0000	B1-12	C	C	T	No	No	No					1		FF	1
451	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	2
452	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
453	20I-11-0000	B1-12	C	G	O	No	No	No					6		F	3
455	20I-11-0000	B1-12	C	X	O	No	No	No					6		FF	3
457	20I-11-0000	B1-12	C	X	O	No	No	No					8		FF	3
460	20I-11-0000	B1-12	C	X	O	No	No	No					1		FF	2
461	20I-11-0000	B1-12	C	X	O	No	No	No					3		FF	2
462	20I-11-0000	B1-12	C	X	O	No	No	No					1		FF	2
463	20I-11-0000	B1-12	C	X	O	No	No	No					2		F	2
464	20I-11-0000	B1-12	C	X	O	No	No	No					16		FF	1
465	20I-11-0000	B1-12	C	X	O	No	No	No	23.12	12.54	4.64		2	C	FF	2
495	19D-21-0000	B1-08	C	C	T	No	No	No					8		F	3
496	19D-21-0000	B1-08	C	T	O	No	No	No					2		F	2
497	19D-21-0000	B1-08	C	C	T	No	No	No					5		FF	3
498	19D-21-0000	B1-08	C	C	O	No	No	No					5		FF	3
499	19D-21-0000	B1-08	C	C	T	No	No	No					5		FF	2
500	19D-21-0000	B1-08	C	C	T	No	No	No	43.07	33.33	9.52		10	C	F	3
501	19D-21-0000	B1-08	C	C	T	No	No	No					3		FF	2
503	19D-21-0000	B1-08	C	W	O	No	No	No					8		FF	3
504	19D-21-0000	B1-08	C	W	O	No	No	No					6		F	3
505	19D-21-0000	B1-08	C	G	T	No	No	No	37.58	20.62	9.57		7	C	F	2
506	19D-21-0000	B1-08	C	X	O	No	No	No					2		FF	2
507	19D-21-0000	B1-08	C	X	O	No	No	No					11		FF	3
508	19D-21-0000	B1-08	C	D	T	No	No	No	56.5	39.65	18.22		31	C	F	4
510	19D-21-0000	B1-08	C	D	T	No	No	No					16		F	3
511	19D-21-0000	B1-08	C	G	O	No	No	No	50.62	24.59	7.59		12	C	FF	4
523	20I-11-0000	B1-12	C	C	T	No	No	No					16		F	4
525	20I-11-0000	B1-12	C	X	O	No	No	No					8		FF	3
527	20I-11-0000	B1-12	C	C	T	No	No	No	36.33	21.9	8.09		6	C	F	3
528	20I-11-0000	B1-12	C	C	T	No	No	No					2		F	2
529	20I-11-0000	B1-12	C	C	T	No	No	No					2		F	2
530	20I-11-0000	B1-12	C	C	T	No	No	No					4		FF	2
531	20I-11-0000	B1-12	C	X	T	No	No	No					0.5		FF	1
532	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
533	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
534	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
535	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
536	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
537	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
538	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
539	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	1
540	20I-11-0000	B1-12	C	C	T	No	No	No	23.22	10.77	3.74		0.5	D	FF	2
541	20I-11-0000	B1-12	C	C	T	No	No	No					0.5		FF	2
542	20I-11-0000	B1-12	C	C	T	No	No	No					2		FF	1

563	19D-17-0000	B1-06	C	C	T	No	No	No				0.5		F	2
564	19D-17-0000	B1-06	C	C	T	No	No	No				4		F	2
566	19D-17-0000	B1-06	C	C	T	No	No	No				0.5		FF	2
567	19D-17-0000	B1-06	C	C	T	No	No	No	26.81	28.61	7.1	5	C	F	2
569	19D-17-0000	B1-06	C	C	O	No	No	No				7		F	3
570	19D-17-0000	B1-06	C	C	O	No	No	No				5		F	2
573	19D-17-0000	B1-06	Z	Z	T	No	No	No				5		HF	2
574	19D-17-0000	B1-06	C	X	T	No	No	No	35.96	25.46	10.6	7	C	F	3
575	19D-17-0000	B1-06	C	X	O	No	No	No				5		F	3
576	19D-17-0000	B1-06	C	X	O	No	No	No				6		FB	4
591	19D-20-0000	B1-08	C	C	T	No	No	No				4		F	2
592	19D-20-0000	B1-08	C	C	T	No	No	No	40.56	18.19	10.38	6	C	FF	3
593	19D-20-0000	B1-08	C	C	O	No	No	No				8		F	2
596	20I-11-0000	B1-12	C	C	T	No	No	No				27		F	3
597	20I-11-0000	B1-12	C	C	T	No	No	No	58.32	37.06	13.12	29	C	F	4
598	20I-11-0000	B1-12	C	C	T	No	No	No				29		F	4
599	20I-11-0000	B1-12	C	C	T	No	No	No				7		FB	3
600	20I-11-0000	B1-12	C	C	T	No	No	No				9		F	3
602	20I-11-0000	B1-12	C	C	T	No	No	No				2		F	2
605	20I-11-0000	B1-12	C	C	T	No	No	No	41.14	33.48	5.91	13	C	F	3
606	20I-11-0000	B1-12	C	C	O	No	No	No				8		FF	3
608	20I-11-0000	B1-12	C	C	T	No	No	No				5		F	2
609	20I-11-0000	B1-12	C	C	T	No	No	No				3		K	2
611	20I-11-0000	B1-12	C	C	T	No	No	No				0.5		F	2
612	20I-11-0000	B1-12	C	C	T	No	No	No				2		F	2
614	20I-11-0000	B1-12	C	C	T	No	No	No				2		FF	2
615	20I-11-0000	B1-12	C	C	T	No	No	No				0.5		F	2
616	20I-11-0000	B1-12	C	C	O	No	No	No				5	C	FF	2
617	20I-11-0000	B1-12	C	C	T	No	No	No				3	R	FF	2
619	20I-11-0000	B1-12	C	C	T	No	No	No				0.5		FF	2
620	20I-11-0000	B1-12	C	C	T	No	No	No				0.5		FF	2
621	20I-11-0000	B1-12	C	C	T	No	No	No				0.5		FF	2
622	20I-11-0000	B1-12	C	C	T	No	No	No				2		FF	2
623	20I-11-0000	B1-12	C	C	T	No	No	No				0.5		FF	1
624	20I-11-0000	B1-12	C	C	O	No	No	No				0.5		FF	1
625	20I-11-0000	B1-12	C	C	T	No	No	No	25.77	12.36	5.09	2	C	FB	2
626	20I-11-0000	B1-12	Q	Z	O	No	No	No				2		F	2
627	20I-11-0000	B1-12	C	X	T	No	No	No				2		FF	2
628	20I-11-0000	B1-12	C	X	O	No	No	No				2		FF	2
629	20I-11-0000	B1-12	C	X	T	No	No	No				1	C	F	2
630	20I-11-0000	B1-12	C	X	O	No	No	No				0.5		FF	1
631	20I-11-0000	B1-12	C	X	T	No	No	No				0.5		FF	1
632	19D-15-0000	B1-06	Q	C	O	No	No	No				2		HF	2
633	19D-15-0000	B1-06	Z	C	O	No	No	No				6		HF	2
634	19D-15-0000	B1-06	C	D	O	No	No	No				19		FF	3
635	19D-15-0000	B1-06	C	Z	T	No	No	No				10		F	3
637	19D-15-0000	B1-06	C	X	O	No	No	No				154		C	4
638	19D-15-0000	B1-06	L	Z	O	No	No	No				5		FF	2
648	19D-15-0000	B1-06	C	C	T	No	No	No				8		FF	3
651	19D-15-0000	B1-06	C	C	T	No	No	No	73	36.65	14.61	32	D	F	4
652	19D-15-0000	B1-06	C	C	T	No	No	No				2		F	2
653	19D-15-0000	B1-06	C	C	T	No	No	No				7		F	2
654	19D-15-0000	B1-06	C	C	T	No	No	No				1		F	2
655	19D-15-0000	B1-06	C	C	T	No	No	No				7		FF	3

658	19D-15-0000	B1-06	C	X	T	No	No	No				2	F	2
660	19D-15-0000	B1-06	C	W	O	No	No	No				114	C	3
661	19D-15-0000	B1-06	C	W	O	No	No	No				6	FF	3
722	20C-19-0000	B1-07	C	C	T	No	No	No	45.52	25.1	6.6	7	C	3
723	20C-19-0000	B1-07	C	D	O	No	No	No				2	F	4
725	20C-19-0000	B1-07	C	D	T	No	No	No	39.98	25.12	6.48	10	C	3
728	20C-19-0000	B1-07	C	C	T	No	No	No				23	F	2
730	20C-19-0000	B1-07	C	X	T	No	No	No				15	F	3
731	20C-19-0000	B1-07	C	D	T	No	No	No				2	FF	2
732	20C-19-0000	B1-07	C	C	T	No	No	No	21.83	17.33	4.43	2	C	2
733	20C-19-0000	B1-07	C	C	T	No	No	No				2	F	2
738	20C-19-0000	B1-07	C	C	T	No	No	No				30	F	2
741	20C-19-0000	B1-07	C	X	T	No	No	No				4	F	2
742	20C-19-0000	B1-07	C	C	O	No	No	No				2	FF	1
743	20C-19-0000	B1-07	C	C	T	No	No	No				0.5	FF	1
746	20C-19-0000	B1-07	C	C	T	No	No	No				2	FF	1
758	20C-19-0000	B1-07	Z	Z	O	No	No	No				7	FF	3
759	20C-19-0000	B1-07	L	Z	O	No	No	No				33	K	3
760	20C-19-0000	B1-07	C	X	O	No	No	No	43.7	27.28	11.24	11	C	3
761	20C-19-0000	B1-07	C	X	O	No	No	No				8	K	3
762	20C-19-0000	B1-07	C	X	O	No	No	No				8	FF	3
764	20C-19-0000	B1-07	L	T	O	No	No	No				2	FF	2
767	20C-19-0000	B1-07	L	T	O	No	No	No				2	K	1
768	20C-19-0000	B1-07	C	T	O	No	No	No				1	FF	2
769	20C-19-0000	B1-07	L	T	O	No	No	No				0.5	FF	1
770	20C-19-0000	B1-07	C	T	O	No	No	No				1	FF	2
771	20C-19-0000	B1-07	C	T	O	No	No	No				2	FF	2
772	20C-19-0000	B1-07	C	T	O	No	No	No	30.45	18.18	5.07	2	FF	2
774	20C-19-0000	B1-07	C	D	T	No	No	No				16	FF	3
775	20C-19-0000	B1-07	C	D	T	No	No	No				194	C	4
776	20C-19-0000	B1-07	C	C	T	No	No	No				5	F	2
777	20C-19-0000	B1-07	C	X	O	No	No	No				11	FF	3
778	20C-19-0000	B1-07	C	X	O	No	No	No				2	FF	1
782	20C-19-0000	B1-07	C	Z	O	No	No	No				5	F	2
783	20C-19-0000	B1-07	C	W	O	No	No	No				2	FF	2
786	20C-19-0000	B1-07	C	C	T	No	No	No	22.4	19.96	8.13	6	C	4
787	20C-19-0000	B1-07	C	C	O	No	No	No				1	F	4
788	20C-19-0000	B1-07	C	C	O	No	No	No				1	F	2
789	20C-19-0000	B1-07	C	C	O	No	No	No				68	K	3
790	20C-19-0000	B1-07	C	C	T	No	No	No				6	FF	2
795	15N-69-0000	B1-04	C	X	O	No	No	No				32	F	4
801	15N-69-0000	B1-04	C	X	O	No	No	No				6	FF	3
803	15N-69-0000	B1-04	C	C	T	No	No	No				5	FF	2
804	15N-69-0000	B1-04	C	C	T	No	No	No				2	D	2
806	15N-69-0000	B1-04	C	D	T	No	No	No	45.23	39.54	14.56	24	C	3
808	15N-69-0000	B1-04	C	D	T	No	No	No				24	K	4
810	15N-69-0000	B1-04	C	W	O	No	No	No				23	FF	4
812	15N-69-0000	B1-04	L	Z	O	No	No	No				13	F	4
838	15N-59-0000	B1-04	L	Z	O	No	No	No				84	K	4
839	15N-59-0000	B1-04	C	T	O	No	No	No				41	K	4
841	15N-59-0000	B1-04	C	T	O	No	No	No	34.48	28.73	10.02	8	C	3
844	15N-59-0000	B1-04	C	G	O	No	No	No				14	K	3
845	15N-59-0000	B1-04	L	Z	O	No	No	No				103	K	4
846	15N-59-0000	B1-04	C	Z	O	No	No	No				14	K	3

850	15N-59-0000	B1-04	C	W	O	No	No	No	41.85	20.84	9.23	7	C	FB	3
855	15N-59-0000	B1-04	C	C	T	No	No	No				67		K	4
861	15N-59-0000	B1-04	C	C	T	No	No	No				37		FF	4
862	15N-59-0000	B1-04	C	X	T	No	No	No				32	C	F	4
863	15N-59-0000	B1-04	C	X	T	No	No	No				5		K	2
918	15N-42-0000	B1-03-G	C	C	T	No	No	No				0.5		FF	2
919	15N-42-0000	B1-03-G	C	X	T	No	No	No	27.24	16.67	6.61	2	D	FF	2
922	15N-42-0000	B1-03-G	C	W	O	No	No	No				0.5		FF	2
923	15N-42-0000	B1-03-G	C	T	O	No	No	No	45.9	37.7	16.45	21	S	F	4
932	15N-69-0000	B1-04	C	C	T	No	No	No				164		C	4
937	15N-69-0000	B1-04	C	D	T	No	No	No				76		C	4
941	15N-69-0000	B1-04	C	X	O	No	No	No				9		F	3
1061	15N-44-0000	B1-03-H	C	X	O	No	No	No				3		F	2
1063	15N-44-0000	B1-03-H	C	X	T	No	No	No	25.35	12.68	4.1	0.5	D	F	2
1064	15N-44-0000	B1-03-H	C	X	T	No	No	No				4		F	3
1066	15N-44-0000	B1-03-H	C	X	O	No	No	No				3		FF	2
1067	15N-44-0000	B1-03-H	C	X	O	No	No	No				3		F	2
1142	15N-25-0000	B1-03-E	C	C	T	No	No	No	54.23	36.67	18.07	30	S	K	4
1144	15N-25-0000	B1-03-E	C	X	O	No	No	No				4		F	2
1153	15N-69-0000	B1-04	C	C	T	No	No	No				20		F	4
1156	15N-69-0000	B1-04	C	C	T	No	No	No				3		FF	3
1158	15N-69-0000	B1-04	C	C	T	No	No	No				3		F	2
1159	15N-42-0000	B1-03-G	C	C	T	No	No	No				12		F	3
1162	15N-42-0000	B1-03-G	C	W	O	No	No	No				11		F	3
1171	15N-42-0000	B1-03-G	Q	Z	O	No	No	No				11		F	3
1174	15N-44-0000	B1-03-H	C	C	T	No	No	No				6		F	2
1175	15N-44-0000	B1-03-H	C	C	T	No	No	No				10		F	3
1178	15N-44-0000	B1-03-H	C	C	T	No	No	No	35.35	20.27	6.36	5	C	F	3
1179	15N-44-0000	B1-03-H	C	C	T	No	No	No				3		F	2
1184	15N-44-0000	B1-03-H	C	C	T	No	No	No				10		FF	3
1187	15N-44-0000	B1-03-H	C	G	O	No	No	No				47		F	4
1213	15N-44-0000	B1-03-H	Q	Z	O	No	No	No				11		F	2
1219	15N-44-0000	B1-03-H	C	C	T	No	No	No				29		F	4
1220	15N-44-0000	B1-03-H	C	D	T	No	No	No				56		FF	4
1310	15N-69-0000	B1-04	C	X	O	No	No	No				19		FF	3
1311	15N-69-0000	B1-04	C	W	O	No	No	No	58.94	19.02	9.16	8	C	FB	3
1313	15N-69-0000	B1-04	C	X	O	No	No	No				6		FF	2
1318	15N-69-0000	B1-04	C	X	T	No	No	No				36		F	4
1321	15N-69-0000	B1-04	C	X	O	No	No	No	33.38	31.14	4.3	19	C	F	3
1322	15N-69-0000	B1-04	C	X	O	No	No	No				3		F	1
1326	15N-69-0000	B1-04	C	X	O	No	No	No				78		K	4
1329	15N-42-0000	B1-03-G	C	X	T	No	No	No				4	C	FB	3
1330	15N-42-0000	B1-03-G	C	Z	O	No	No	No				37		F	4
1331	15N-42-0000	B1-03-G	C	W	O	No	No	No				154		C	4
1335	20C-19-0000	B1-07	C	X	O	No	No	No				3		FF	2
1336	20C-19-0000	B1-07	C	C	T	No	No	No	30.05	21.2	5.81	3	C	F	2
1337	20C-19-0000	B1-07	C	C	O	No	No	No				4		FF	2
1338	20C-19-0000	B1-07	C	C	T	No	No	No				2		F	1
1339	20C-19-0000	B1-07	C	W	O	No	No	No				0.5		FF	1
1342	20C-19-0000	B1-07	L	Z	O	No	No	No				117		C	4
1343	20C-19-0000	B1-07	C	W	O	No	No	No				9		FF	3
1344	20C-19-0000	B1-07	C	W	O	No	No	No				0.5		FF	1
1345	20C-19-0000	B1-07	C	G	O	No	No	No				0.5		FF	1
1371	20C-3-0000	B1-05	C	W	O	No	No	No				9	C	FB	3

1372	20C-3-0000	B1-05	L	W	O	No	No	No				5		F	2
1376	20C-3-0000	B1-05	C	X	O	No	No	No				15		FF	4
1378	20C-3-0000	B1-05	C	T	O	No	No	No				2		F	2
1383	20C-3-0000	B1-05	C	C	T	No	No	No				3		F	2
1385	20C-3-0000	B1-05	C	G	O	No	No	No				8		F	3
1386	20B-7-0000	B1-06	C	X	O	No	No	No	41.71	19.41	17.14	56	DBF	F	4
1387	20B-7-0000	B1-06	C	C	O	No	No	No	60.66	25.86	11.06	6	P	F	4
1393	20C-19-0000	B1-07	S	B	O	No	No	No				3		FF	2
1422	20A-3 C1:2000	B1-04	C	X	O	No	No	No				22		FB	4
1425	20A-3 C1:2000	B1-04	C	C	T	No	No	No				8		FF	3
1427	20A-3 C1:2000	B1-04	C	W	O	No	No	No				2		FF	2
1429	20A-3 C1:2000	B1-04	C	X	T	No	No	No				0.5		FF	2
1430	20A-3 C1:2000	B1-04	C	X	T	No	No	No				0.5	D	FF	2
1431	20A-3 C1:2000	B1-04	L	Z	O	No	No	No				3		F	2
1440	20A-8 C1:2000	B1-04	C	D	T	No	No	No				7		F	2
1441	20A-8 C1:2000	B1-04	C	D	T	No	No	No				10		FF	2
1444	20A-8 C1:2000	B1-04	Z	Z	O	No	No	No				3		F	2
1447	20A-8 C1:2000	B1-04	C	C	T	No	No	No				6		F	2
1448	20A-8 C1:2000	B1-04	C	W	O	No	No	No				3		FF	2
1450	20A-8 C1:2000	B1-04	C	C	T	No	No	No				2		F	1
1455	20C-3-0000	B1-05	C	W	O	No	No	No				23	S	C	4
1456	20C-3-0000	B1-05	C	X	O	No	No	No				73	C	F	4
1461	20C-3-0000	B1-05	C	D	T	No	No	No				84	S	K	4
1462	20C-3-0000	B1-05	C	G	O	No	No	No				14		F	3
1471	20C-3-0000	B1-05	L	Z	O	No	No	No				26		F	4
1472	20C-3-0000	B1-05	C	C	T	No	No	No				9	C	F	3
1476	20C-3-0000	B1-05	C	X	T	No	No	No				10	C	F	4
1477	20C-3-0000	B1-05	C	T	O	No	No	No				14	C	F	3
1482	20C-3-0000	B1-05	C	C	T	No	No	No				5		F	2
1486	20C-3-0000	B1-05	C	D	T	No	No	No				18	C	FB	3
1548	20A-6-0000	B1-04	C	W	O	No	No	No				18	S	F	3
1549	20A-6-0000	B1-04	C	G	O	No	No	No				11		F	2
1550	20A-6-0000	B1-04	C	X	O	No	No	No				58	S	K	3
1554	20A-6-0000	B1-04	M	B	O	No	No	No				33		F	3
1556	20A-6-0000	B1-04	S	G	O	No	No	No				100		FF	4
1558	20B-1-0000	B1-05	L	Z	O	No	No	No				115		C	4
1559	20B-1-0000	B1-05	C	C	T	No	No	No				158		K	4
1560	20B-1-0000	B1-05	C	D	T	No	No	No				28		F	3
1561	20B-1-0000	B1-05	C	D	O	No	No	No				14		F	3
1562	20B-1-0000	B1-05	C	W	O	No	No	No				20		F	2
1563	20B-1-0000	B1-05	C	G	O	No	No	No				14		FF	2
1564	20B-1-0000	B1-05	C	X	O	No	No	No				24	S	F	4
1565	20B-1-0000	B1-05	C	T	O	No	No	No				12	C	F	3
1566	20B-1-0000	B1-05	C	C	T	No	No	No				4	C	F	2
1567	20B-1-0000	B1-05	C	T	O	No	No	No				4		FF	2
1568	20B-1-0000	B1-05	C	Z	O	No	No	No				11	S	F	3
1572	20B-1-0000	B1-05	C	X	O	No	No	No				24	C	F	3
1577	20B-1-0000	B1-05	C	X	O	No	No	No				9		F	2
1588	19D-6-1399	B1-02	C	C	T	No	No	No				2		FF	2
1589	20B-11-1281	B1-13	C	C	T	No	No	No				1		FF	2
1591	20B-11-1285	B1-13	C	C	T	No	No	No				1		FB	1
1593	19D-5-1358	B1-02	C	C	T	No	No	No				1		FB	2
1595	20A-17-1333	B1-05	C	C	T	No	No	No				2		FF	2
1600	19D-9-1428	B1-02	O	B	T	No	No	No	37.01	8.44	3.5	0.5		PPB	3

1604	19D-9-1431	B1-02	O	B	T	No	No	No	31.2	13.03	2.81	2		PPB	2
1605	19D-9-1429	B1-02	O	B	T	No	No	No	11.36	8.01	2.63	0.5		DPB	1
1609	19D-9-1430	B1-02	O	B	T	No	No	No	21.05	9.21	2.12	0.5	C	MPB	2
1610	19D-6-1347	B1-02	O	B	T	No	No	No	15.76	8.45	2.94	0.5	S	MPB	2
1611	19D-6-1345	B1-02	O	B	T	No	No	No	31.45	12.31	4.06	0.5	C	MPB	2
1612	19D-9-1432	B1-02	O	B	T	No	No	No	22.82	11.58	3.11	0.5	S	MPB	2
1614	19D-6-1344	B1-02	O	B	T	No	No	No	36.58	11.5	2.77	2	C	PPB	3
1615	15N-206-1315	B1-02	O	G	T	No	No	No	37.14	20.7	6.73	6	SN	F	2
1618	19D-5-1336	B1-02	Z			No	No	No	103.06	56.95	43.93	323		H	4
1622	19D-6-1399	B1-02	C	C	T	No	No	No				2		FF	2
1623	20B-11-1281	B1-13	C	C	T	No	No	No				1		FF	2
1624	19D-7-1386	B1-02	C	C	T	No	No	No	49.47	27.15	9.31	18	R	B	4
1625	20B-11-1285	B1-13	C	C	T	No	No	No				1		FB	1
1627	19D-5-1358	B1-02	C	C	T	No	No	No				1		FB	2
1628	20J-1-1395	B1-05-B	C	C	T	No	No	No	39.38	6.12	6.16	1	D	FF	3
1629	20A-17-1333	B1-05	C	C	T	No	No	No				2		FF	2
1631	19D-6-1341	B1-02	O	B	T	No	No	No	24.5	9.19	1.98	1		MPB	2
1632	19D-6-1350	B1-02	O	B	T	No	No	No	21.34	9.14	3.03	0.5	C	MPB	2
1633	19D-6-1342	B1-02	O	B	T	No	No	No	12.84	13.6	1.98	0.5		MPB	1
1635	19D-6-1346	B1-02	O	B	T	No	No	No	21.08	8.07	2.49	0.5		MPB	2
1636	19D-5-1338	B1-02	O	B	T	No	No	No	31.4	9.94	2.15	0.5		DPB	2
1640	19D-6-1351	B1-02	O	B	T	No	No	No	16.29	21.96	5.18	2	S	F	2
1641	19D-4-1312	B1-02	O	B	T	No	No	No	21.89	9.24	2.5	0.5	C	MPB	2
1642	19D-6-1340	B1-02	O	B	T	No	No	No	29.62	8.89	2.28	0.5	S	PPB	2
1644	19D-6-1347	B1-02	O	B	T	No	No	No	15.76	8.45	2.94	0.5	S	MPB	2
1647	19D-6-1347	B1-02	O	B	T	No	No	No				0.5	S	MPB	1
1648	19D-9-1343	B1-02	O	B	T	No	No	No	24.29	9.42	2.07	0.5	C	MPB	2
1651	19D-6-1348	B1-02	C	C	O	No	No	No	129.46	61.3	25.98	205		B	4
1652	19D-9-1427	B1-02	C	T	O	No	No	No	91.9	47.73	28.95	153		AZ	4
1658	20C-1-0000	B1-05	L	W	O	No	No	No				187		C	4
1661	20C-1-0000	B1-05	C	X	O	No	No	No				58		F	4
1665	20C-1-0000	B1-05	C	C	T	No	No	No				11		F	2
1669	20C-1-0000	B1-05	C	C	T	No	No	No				13		FF	2
1672	20C-1-0000	B1-05	C	C	O	No	No	No				3		FF	2
1674	20C-1-0000	B1-05	C	C	T	No	No	No	47.86	53.73	17.17	38	S	F	3
1675	20C-1-0000	B1-05	C	C	T	No	No	No				18		F	3
1677	20C-1-0000	B1-05	C	X	O	No	No	No				18		F	3
1686	20C-1-0000	B1-05	C	X	O	No	No	No				12		FF	2
1692	20C-5-0000	B1-05	C	C	T	No	No	No				18		F	3
1706	20C-5-0000	B1-05	C	C	T	No	No	No				5		F	2
1710	20C-5-0000	B1-05	C	W	O	No	No	No				8		F	3
1715	20C-5-0000	B1-05	C	C	T	No	No	No				3		F	2
1716	20C-5-0000	B1-05	C	G	O	No	No	No				4		FF	2
1722	20C-5-0000	B1-05	C	X	T	No	No	No				0.5		B	2
1726	20C-5-0000	B1-05	C	C	T	No	No	No				2		F	1
1728	20A-6-0000	B1-04	C	X	O	No	No	No				14		FF	2
1731	20A-6-0000	B1-04	C	C	T	No	No	No				8		F	2
1733	20A-6-0000	B1-04	C	C	T	No	No	No				1		F	1
1734	20A-6-0000	B1-04	C	C	T	No	No	No				5		F	2
1735	20A-6-0000	B1-04	C	C	T	No	No	No				1		F	2
1736	20A-6-0000	B1-04	C	C	T	No	No	No				1		F	1
1737	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		FF	1
1738	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		FF	1
1739	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		FF	2

1740	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		FB	1
1742	20A-6-0000	B1-04	C	D	T	No	No	No				4		F	2
1744	20A-6-0000	B1-04	C	X	T	No	No	No	28.87	17.93	9.86	2	C	F	2
1745	20A-6-0000	B1-04	C	C	T	No	No	No				2		F	2
1746	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		F	2
1747	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		F	2
1748	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		F	1
1749	20A-6-0000	B1-04	C	C	T	No	No	No				0.5		FF	1
1750	20A-6-0000	B1-04	C	C	T	No	No	No				5		FF	1
1751	20A-6-0000	B1-04	C	C	T	No	No	No				6		FF	2
1754	20A-6-0000	B1-04	C	Z	O	No	No	No	27.2	6.7	7.52	5	S	FF	2
1755	20A-6-0000	B1-04	C	W	O	No	No	No				6		F	2
1757	20A-6-0000	B1-04	C	Z	O	No	No	No				3		F	3
1760	20A-6-0000	B1-04	C	W	O	No	No	No				0.5		FF	2
1762	20A-6-0000	B1-04	C	X	O	No	No	No				12		FF	2
1765	20A-6-0000	B1-04	C	G	O	No	No	No				0.5		FF	1
1767	20A-6-0000	B1-04	C	X	O	No	No	No				0.5		FF	1
1794	20D-9-0000	B1-08	C	C	T	No	No	No	46.46	38.68	11.53	21	C	F	3
1795	20D-9-0000	B1-08	C	G	T	No	No	No				63		F	4
1796	20D-9-0000	B1-08	C	C	T	No	No	No	35.92	29.03	13.26	15	S	F	3
1802	20D-9-0000	B1-08	C	C	T	No	No	No				21		FB	3
1804	20D-9-0000	B1-08	L	W		No	No	No				28		FF	2
1811	20D-9-0000	B1-08	C	C	T	No	No	No				14		FF	2
1812	20D-9-0000	B1-08	C	D	T	No	No	No				7		FF	3
1814	20D-9-0000	B1-08	C	C	T	No	No	No				12		F	2
1819	20D-9-0000	B1-08	C	C	T	No	No	No				4		F	2
1821	20D-9-0000	B1-08	C	C	T	No	No	No				2		FF	2
1825	20D-9-0000	B1-08	C	C	T	No	No	No				2		F	2
1827	20D-9-0000	B1-08	C	C	T	No	No	No				0.5		FF	2
1830	20D-9-0000	B1-08	C	C	T	No	No	No				3		F	2
1832	20D-9-0000	B1-08	C	X	T	No	No	No				2		F	2
1833	20D-9-0000	B1-08	C	X	T	No	No	No				1		FF	2
1834	20D-9-0000	B1-08	C	X	T	No	No	No				3		FF	1
1835	20D-9-0000	B1-08	C	X	O	No	No	No	19.86	11.64	4.34	1		F	2
1843	20D-9-0000	B1-08	C	Z	O	No	No	No	25.17	19.87	8.87	3	C	F	3
1844	20D-9-0000	B1-08	C	G	O	No	No	No				1		FF	1
1845	20D-9-0000	B1-08	C	G	O	No	No	No				2		FF	2
1846	20D-9-0000	B1-08	C	W	O	No	No	No	13.82	9.55	6.44	1	C	FF	2
1847	20D-9-0000	B1-08	C	W	O	No	No	No				3		FF	2
1860	20D-9-0000	B1-08	C	D	C	No	No	No				4		F	2
1876	20D-9-0000	B1-08	C	C	T	No	No	No				2		FF	2
1887	20D-8-0000	B1-08	C	D	T	No	No	No	25.12	15.75	4	2	C	F	2
1888	20D-8-0000	B1-08	C	D	T	No	No	No				4		F	2
1889	20D-8-0000	B1-08	C	Z	O	No	No	No				13		F	3
1890	20D-8-0000	B1-08	C	X	O	No	No	No				2		F	2
1893	20D-8-0000	B1-08	C	G	O	No	No	No				1		F	2
1894	20D-8-0000	B1-08	C	C	T	No	No	No				1		FF	1
1895	20D-8-0000	B1-08	C	C	T	No	No	No				1		FF	1
1901	20D-8-0000	B1-08	C	C	T	No	No	No	45.68	22.68	11.49	11	S	F	3
1924	20A-6-0000	B1-04	L	W	O	No	No	No				176		K	4
1926	20A-6-0000	B1-04	C	C	T	No	No	No				68		F	4
1955	20A-6-0000	B1-04	L	W	O	No	No	No				176		K	4
1957	20A-6-0000	B1-04	C	C	T	No	No	No				68		F	4
1967	15N-69-0000	B1-04	C	W	O	No	No	No				6		FF	2

1968	15N-69-0000	B1-04	C	C	T	No	No	No	46.81	23.79	15.52	11	C	FF	4
1970	15N-69-0000	B1-04	C	C	P	No	No	No				8		F	3
1971	15N-69-0000	B1-04	C	X	T	No	No	No				19		FF	3
1977	15N-69-0000	B1-04	C	X	P	No	No	No				51		F	4
1979	15N-69-0000	B1-04	C	X	O	No	No	No				9		FF	2
1980	15N-69-0000	B1-04	C	X	O	No	No	No				3		FB	2
1981	15N-69-0000	B1-04	C	X	O	No	No	No				7		F	3
1983	15N-69-0000	B1-04	C	Z	O	No	No	No				3		F	2
1984	15N-69-0000	B1-04	C	W	O	No	No	No				11		F	3
1985	15N-69-0000	B1-04	C	Z	O	No	No	No	28.04	20.31	5.07	2	C	F	2
1987	15N-69-0000	B1-04	C	W	O	No	No	No				6		F	3
1988	15N-69-0000	B1-04	C	C	O	No	No	No				2		F	2
1989	15N-69-0000	B1-04	C	X	O	No	No	No				5	S	F	2
1990	15N-69-0000	B1-04	C	G	O	No	No	No				11		FF	3
2035	20A-13-0000	B1-13	C	W	O	No	No	No	55.23	49.63	15.95	43	S	F	4
2036	20A-13-0000	B1-13	C	W	O	No	No	No				6		F	1
2037	20A-13-0000	B1-13	C	W	T	No	No	No				9		F	1
2038	20A-13-0000	B1-13	C	W	T	No	No	No				5		FF	1
2039	20A-13-0000	B1-13	C	W	T	No	No	No				0.5		F	1
2040	20A-13-0000	B1-13	C	X	O	No	No	No				0.5		FF	1
2041	20A-13-0000	B1-13	C	X	T	No	No	No				5		F	1
2042	20A-13-0000	B1-13	C	X	T	No	No	No	29.75	19.1	7.68	5	C	F	1
2043	20A-13-0000	B1-13	C	X	T	No	No	No				3		FF	1
2044	20A-13-0000	B1-13	C	X	T	No	No	No				3		FF	1
2045	20A-13-0000	B1-13	C	X	T	No	No	No				2		FF	1
2047	20A-13-0000	B1-13	C	X	O	No	No	No				3		FF	1
2048	20A-13-0000	B1-13	C	X	T	No	No	No	19.61	10.71	2.83	0.5	C	FF	1
2050	20A-13-0000	B1-13	C	C	O	No	No	No				14		F	1
2088	20A-13-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2090	20A-13-0000	B1-13	C	C	T	No	No	No	60.13	47.22	13.37	29	S	F	2
2092	20A-13-0000	B1-13	C	C	T	No	No	No				18		FF	2
2093	20A-13-0000	B1-13	C	C	T	No	No	No				15		FF	1
2094	20A-13-0000	B1-13	C	X	T	No	No	No				9		F	2
2095	20A-13-0000	B1-13	C	C	T	No	No	No				12		F	1
2096	20A-13-0000	B1-13	C	X	T	No	No	No				9		F	1
2097	20A-13-0000	B1-13	C	C	T	No	No	No				6		FF	1
2100	20A-13-0000	B1-13	C	D	T	No	No	No				5		F	1
2101	20A-13-0000	B1-13	C	C	T	No	No	No				2		F	1
2102	20A-13-0000	B1-13	C	C	T	No	No	No				6		FF	2
2103	20A-13-0000	B1-13	C	C	T	No	No	No				5		F	1
2104	20A-13-0000	B1-13	C	C	T	No	No	No				2		F	1
2105	20A-13-0000	B1-13	C	C	T	No	No	No				2		FF	1
2108	20A-13-0000	B1-13	C	G	T	No	No	No	85.29	55.77	22.14	80	S	F	4
2109	20A-13-0000	B1-13	C	D	T	No	No	No	51.79	42.34	25.39	56	S	F	4
2110	20A-13-0000	B1-13	C	G	O	No	No	No				4		F	2
2112	20A-13-0000	B1-13	C	X	T	No	No	No	47.34	28.9	12.31	22		F	4
2129	20A-13-0000	B1-13	C	X	T	No	No	No				5		FF	3
2130	20A-13-0000	B1-13	C	X	T	No	No	No				119		FF	4
2132	20A-13-0000	B1-13	C	C	T	No	No	No				413		K	4
2135	20J-20-0000	B1-13	C	X	O	No	No	No	39.66	37.95	13.3	22	C	F	3
2138	20J-20-0000	B1-13	C	X	O	No	No	No				6		FF	3
2139	20J-20-0000	B1-13	C	X	T	No	No	No	24.22	17.55	3.85	0.5	C	F	1
2140	20J-20-0000	B1-13	C	X	O	No	No	No				11		F	3
2141	20J-20-0000	B1-13	C	X	O	No	No	No				2		FF	2

2142	20J-20-0000	B1-13	C	X	O	No	No	No				0.5		FF	1
2143	20J-20-0000	B1-13	C	X	O	No	No	No				0.5		FF	1
2144	20J-20-0000	B1-13	C	X	O	No	No	No				96		FF	4
2161	20E-1-1151	B1-10	C	C	T	No	No	No				9		F	3
2162	20E-1-1151	B1-10	C	C	O	No	No	No				6		F	3
2163	20E-1-1151	B1-10	C	C	T	No	No	No	22.9	6.42	3.41	0.5	D	FF	2
2164	20E-1-1151	B1-10	C	X	T	No	No	No				0.5		FF	2
2165	20E-1-1151	B1-10	C	C	T	No	No	No	29.08	11.16	5.03	2	D	FF	2
2166	20E-1-1151	B1-10	C	C	T	No	No	No				0.5		FF	1
2167	20E-1-1151	B1-10	C	C	T	No	No	No				2		FF	2
2168	20E-1-1151	B1-10	C	C	O	No	No	No				0.5		FF	2
2169	20D-22-1102	B1-08	C	W	T	No	No	No	35.55	6.5	4.26	2	D	FF	3
2171	20D-24-1154	B1-08	C	C	T	No	No	No				0.5		FF	2
2172	20D-24-1154	B1-08	C	X	T	No	No	No	29.28	8.53	7.83	2	D	FF	2
2173	20D-24-1154	B1-08	C	X	T	No	No	No				0.5		FF	2
2175	20D-24-1154	B1-08	C	C	T	No	No	No	20.25	6.53	5.01	0.5	D	FF	2
2176	20D-24-1154	B1-08	C	G	O	No	No	No				2		FF	2
2177	20D-24-1154	B1-08	Q	Z	O	No	No	No				2		FF	2
2203	20E-2-1146	B1-10	C	C	T	No	No	No	49.86	25.42	17.6	15	D	FF	3
2204	20E-2-1146	B1-10	C	X	T	No	No	No				0.5		FF	1
2205	20E-2-1146	B1-10	C	W	T	No	No	No				0.5		FF	2
2206	20E-2-1146	B1-10	Q	Z	O	No	No	No				2		FF	2
2215	15N-129-669	B1-05	C	X	O	No	No	No	86.4	43.16	26.21	92		B	4
2216	15N-129-669	B1-05	C	W	O	No	No	No	95.28	46.9	29.29	115		B	4
2236	20C-28-1110	B1-08	C	X	T	No	No	No				0.5		FF	2
2237	20C-28-1110	B1-08	C	C	T	No	No	No				0.5		FF	2
2238	20C-28-1110	B1-08	C	G	T	No	No	No	30.56	6.14	5.04	0.5	D	FF	2
2239	20C-28-1110	B1-08	C	X	T	No	No	No	26.17	11.23	5.33	0.5	D	FF	2
2242	20E-1-1150	B1-10	Q	C	T	No	No	No				0.5		FF	2
2244	20A-23-1105	B1-13	C	C	T	No	No	No				3		FF	1
2245	20A-23-1105	B1-13	C	C	T	No	No	No				2		FF	2
2246	20A-23-1105	B1-13	C	C	T	No	No	No	29.27	8.44	10.37	2	C	FF	2
2283	20A-13-0000	B1-13	C	C	T	No	No	No				3		FF	1
2285	20A-13-0000	B1-13	C	C	T	No	No	No				2		F	1
2286	20A-13-0000	B1-13	C	C	T	No	No	No				2		FF	1
2287	20A-13-0000	B1-13	C	C	T	No	No	No				0.5		F	1
2288	20A-13-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2289	20A-13-0000	B1-13	C	C	T	No	No	No	22.07	15.19	6.79	1	C	F	1
2291	20A-13-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2294	20A-13-0000	B1-13	C	C	T	No	No	No	23.7	16.63	4.55	2	C	FF	1
2297	20A-13-0000	B1-13	C	C	O	No	No	No				2		FF	1
2299	20A-13-0000	B1-13	C	C	T	No	No	No				2		F	1
2301	20A-13-0000	B1-13	C	C	T	No	No	No				1		FF	1
2303	20A-13-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2304	20A-13-0000	B1-13	C	C	T	No	No	No				2		FF	1
2305	20A-13-0000	B1-13	C	X	T	No	No	No				2		FF	1
2306	20A-13-0000	B1-13	C	C	T	No	No	No				3		FF	1
2307	20A-13-0000	B1-13	C	C	T	No	No	No				5		FF	1
2308	20A-13-0000	B1-13	C	C	T	No	No	No				1	B	FF	1
2311	20A-13-0000	B1-13	C	D	T	No	No	No				4		F	1
2312	20A-13-0000	B1-13	C	D	T	No	No	No				8		F	1
2313	20A-13-0000	B1-13	C	D	T	No	No	No				45		F	2
2331	20A-13-0000	B1-13	C	X	T	No	No	No				3		F	1
2332	20A-13-0000	B1-13	C	X	T	No	No	No				2		FF	1

2334	20A-13-0000	B1-13	C	X	O	No	No	No				18		FF	2
2335	20A-13-0000	B1-13	C	X	O	No	No	No				3		FF	1
2336	20A-13-0000	B1-13	C	X	T	No	No	No				1		FF	1
2337	20A-13-0000	B1-13	C	X	O	No	No	No				1		FF	1
2338	20A-13-0000	B1-13	C	X	O	No	No	No				9		FF	2
2340	20A-13-0000	B1-13	C	X	T	No	No	No				73		C	2
2341	20A-13-0000	B1-13	C	G	T	No	No	No				9		F	1
2342	20A-13-0000	B1-13	C	G	O	No	No	No				5		FF	2
2344	20A-13-0000	B1-13	C	G	O	No	No	No				3		FF	1
2346	20A-13-0000	B1-13	C	W	O	No	No	No				7		FF	1
2348	20A-13-0000	B1-13	L	Z	O	No	No	No				16		FF	2
2349	20A-13-0000	B1-13	L	Z	O	No	No	No				7		FF	1
2350	20A-13-0000	B1-13	Q	C	T	No	No	No				6		HF	1
2351	20A-13-0000	B1-13	C	C	O	No	No	No				131		F	2
2354	20A-13-0000	B1-13	C	C	T	No	No	No	50.33	50.04	23	35	S	F	2
2355	20A-13-0000	B1-13	C	C	T	No	No	No	24	36.17	18.73	33	C	F	2
2356	20A-13-0000	B1-13	C	C	T	No	No	No				64		FF	2
2357	20A-13-0000	B1-13	C	C	T	No	No	No	41.08	40.17	11.3	1	C	F	2
2358	20A-13-0000	B1-13	C	C	T	No	No	No				2		FF	1
2360	20A-13-0000	B1-13	C	C	T	No	No	No				4		F	1
2361	20A-13-0000	B1-13	C	C	T	No	No	No	52.01	24.13	7.38	8	C	F	2
2364	20A-13-0000	B1-13	C	C	T	No	No	No				7		FF	2
2365	20A-13-0000	B1-13	C	C	T	No	No	No				11		F	2
2366	20A-13-0000	B1-13	C	C	T	No	No	No				8		FF	2
2367	20A-13-0000	B1-13	C	C	T	No	No	No				2		F	2
2368	20A-13-0000	B1-13	C	C	T	No	No	No				8		FF	3
2369	20A-13-0000	B1-13	C	C	T	No	No	No	21.04	21.86	7.27	9		F	3
2370	20A-13-0000	B1-13	C	D	T	No	No	No				4	C	F	2
2372	20A-13-0000	B1-13	C	C	T	No	No	No				19		FF	3
2374	20A-13-0000	B1-13	C	C	T	No	No	No				10		F	2
2375	20A-13-0000	B1-13	C	C	O	No	No	No	33.56	35.78	8.32	6	C	F	2
2376	20A-13-0000	B1-13	C	C	T	No	No	No	31.63	24.04	8.7	1	PP	F	1
2377	20A-13-0000	B1-13	C	C	T	No	No	No	26.64	15.45	2.91	3	C	F	2
2378	20A-13-0000	B1-13	C	C	O	No	No	No				9		FF	2
2379	20A-13-0000	B1-13	C	C	O	No	No	No				11		FF	2
2380	20A-13-0000	B1-13	C	C	O	No	No	No				2		FF	2
2382	20A-13-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2384	20A-13-0000	B1-13	C	C	O	No	No	No				2		FF	2
2386	20A-13-0000	B1-13	C	C	T	No	No	No				2		FF	2
2388	20A-13-0000	B1-13	C	C	T	No	No	No	35.4	33.29	9.36	6	C	FF	3
2389	20A-13-0000	B1-13	C	C	T	No	No	No	43.71	18.73	13.53	6	C	FF	3
2391	15N-170-1164	B1-07	C	X	O	No	No	No				150		C	4
2395	20F-1-1213	B1-13	C	C	T	No	No	No	27.18	5.24	4.86	0.5	D	FF	2
2398	20C-28-1120	B1-08	C	X	T	No	No	No	41.22	11.21	6.73	2	C	FF	3
2399	20C-28-1120	B1-08	C	X	O	No	No	No				4		FF	4
2401	20A-13-1159	B1-13	Q	C	T	No	No	No				0.5		FF	1
2402	20A-13-1159	B1-13	C	C	O	No	No	No				0.5		F	1
2403	20D-23-1236	B1-08	C	C	T	No	No	No	37.76	10.25	6.49	3	D	FF	2
2404	20D-23-1236	B1-08	C	X	T	No	No	No				0.5		FF	2
2406	20D-23-1236	B1-08	Q	Z	O	No	No	No				7		HF	3
2407	20A-23-1107	B1-13	C	G	O	No	No	No	33.22	5.9	4.5	0.5	D	FF	2
2408	20A-23-1107	B1-13	C	T	T	No	No	No				0.5		FF	2
2410	20A-13-1068	B1-13	C	C	T	No	No	No				0.5		FF	2
2411	20A-13-1068	B1-13	C	R	T	No	No	No				0.5		FF	2

2412	20A-13-1068	B1-13	C	C	T	No	No	No				0.5		FF	2
2414	20A-13-1068	B1-13	C	X	T	No	No	No	42.27	21.19	6.31	6	D	F	3
2416	20A-21-1045	B1-13	O	B	T	No	No	No	18.76	15.29	2.41	0.5		MPB	2
2418	20D-18-1057	B1-08	C	C	T	No	No	No	23.67	6.3	4.75	0.5	D	FF	2
2419	20A-22-1064	B1-13	C	C	T	No	No	No	41.07	10.92	5.44	2	D	FF	3
2421	20A-21-1056	B1-08	C	X	O	No	No	No	27.12	8.42	3.46	0.5	D	FF	2
2422	20A-21-1056	B1-08	C	C	T	No	No	No				0.5		FF	2
2423	20A-21-1056	B1-08	C	C	T	No	No	No				0.5		FF	2
2427	20A-21-1047	B1-08	Q	C	T	No	No	No				2		F	2
2433	20E-6-1232	B1-10	C	C	T	No	No	No	16.15	7.79	4.54	0.5	C	FF	1
2434	20E-6-1232	B1-10	C	C	T	No	No	No				0.5		FF	2
2436	20D-28-1220	B1-08	C	C	T	No	No	No	21.02	6.65	4.11	0.5	D	FF	2
2437	20D-28-1220	B1-08	C	X	T	No	No	No				0.5		FF	2
2438	20D-28-1220	B1-08	C	X	T	No	No	No				2		FF	3
2440	20D-27-1192	B1-08	C	C	T	No	No	No				0.5		FF	2
2441	20D-27-1192	B1-08	C	X	T	No	No	No				2		FF	3
2442	20D-27-1192	B1-08	C	X	T	No	No	No				6		FF	3
2443	20D-27-1192	B1-08	C	X	T	No	No	No				0.5		FF	1
2444	20E-5-1212	B1-10	C	C	T	No	No	No				0.5		FF	2
2445	20E-5-1212	B1-10	C	X	T	No	No	No	50.6	6.41	5.53	2	D	FF	4
2448	20D-23-1217	B1-08	C	C	O	No	No	No				0.5		FF	2
2449	20D-23-1217	B1-08	C	C	T	No	No	No				0.5		FF	2
2455	20C-24-1095	B1-07	C	X	O	No	No	No				2		FF	3
2455	20C-24-1095	B1-07	C	X	O	No	No	No				2		FF	3
2457	20D-26-1205	B1-08	C	X	T	No	No	No	18.48	5.42	6.56	0.5	D	FF	2
2458	20D-26-1205	B1-08	C	C	T	No	No	No	18.08	7.74	4.65	0.5	C	FF	1
2460	20C-24-1095	B1-07	C	C	T	No	No	No	24.16	12.85	6.03	0.5	C	FF	2
2461	20C-24-1095	B1-07	C	X	T	No	No	No	36.59	9.26	5.35	0.5	B	FF	3
2462	20C-24-1095	B1-07	C	X	T	No	No	No				2		FF	2
2462	20C-24-1095	B1-07	C	X	T	No	No	No				2		FF	2
2463	20C-24-1095	B1-07	C	X	T	No	No	No	23.16	5.89	2.54	0.5	D	FF	2
2464	20C-24-1095	B1-07	C	D	T	No	No	No				0.5		FF	2
2464	20C-24-1095	B1-07	C	D	T	No	No	No				0.5		FF	2
2465	20j-20-0000	B1-13	C	C	T	No	No	No				4		F	3
2466	20j-20-0000	B1-13	C	C	T	No	No	No				0.5		F	1
2467	20j-20-0000	B1-13	C	C	T	No	No	No				2		F	1
2468	20j-20-0000	B1-13	C	C	T	No	No	No				19		FF	4
2470	20j-20-0000	B1-13	C	C	T	No	No	No				20		FF	4
2471	20j-20-0000	B1-13	C	C	T	No	No	No				3	C	F	2
2472	20j-20-0000	B1-13	C	C	T	No	No	No				5		FF	2
2473	20j-20-0000	B1-13	C	C	T	No	No	No				20		F	4
2474	20j-20-0000	B1-13	C	C	T	No	No	No				19		F	4
2477	20j-20-0000	B1-13	C	C	T	No	No	No				5		FF	3
2478	20j-20-0000	B1-13	C	C	T	No	No	No				1		FF	1
2479	20j-20-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2482	20A-18-0000	B1-13	C	C	T	No	No	No				17		F	4
2483	20A-18-0000	B1-13	C	C	T	No	No	No				6		F	2
2484	20A-18-0000	B1-13	C	C	T	No	No	No				2		FF	2
2489	20J-15-0000	B1-13	C	C	T	No	No	No				6		F	2
2490	20J-15-0000	B1-13	C	C	T	No	No	No				2		FF	2
2491	20J-15-0000	B1-13	C	C	O	No	No	No				4		FF	2
2492	20J-15-0000	B1-13	C	X	O	No	No	No				27		F	3
2495	20A-18-0000	B1-13	C	C	T	No	No	No				1		FF	3
2496	20A-18-0000	B1-13	C	C	T	No	No	No				4		F	2

2497	20A-18-0000	B1-13	C	C	O	No	No	No				4		FF	2
2498	20A-18-0000	B1-13	C	X	T	No	No	No				3		FF	2
2500	20A-18-0000	B1-13	C	X	O	No	No	No				51		F	4
2501	20A-18-0000	B1-13	C	X	O	No	No	No				2		FF	2
2508	20F-3-0000	B1-13	C	C	T	No	No	No				5		F	3
2509	20F-3-0000	B1-13	C	C	T	No	No	No				1		FF	2
2510	20F-3-0000	B1-13	C	C	O	No	No	No				3		FF	3
2511	20F-3-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2512	20F-3-0000	B1-13	C	D	O	No	No	No				8		F	2
2514	20F-3-0000	B1-13	C	X	T	No	No	No				20		F	4
2515	20F-3-0000	B1-13	C	W	O	No	No	No				3		F	2
2516	20F-3-0000	B1-13	C	W	O	No	No	No				1		FF	2
2517	20F-3-0000	B1-13	C	X	O	No	No	No				8		FF	2
2518	20F-3-0000	B1-13	C	X	O	No	No	No				6		FF	2
2519	20F-3-0000	B1-13	C	X	T	No	No	No				3		FF	2
2524	20F-3-0000	B1-13	C	D	T	No	No	No	33.14	27.42	12.97	7	D	F	3
2525	20F-3-0000	B1-13	C	C	O	No	No	No				11		F	4
2526	20F-3-0000	B1-13	C	C	T	No	No	No				14		F	3
2527	20F-3-0000	B1-13	C	C	T	No	No	No				2		FF	2
2528	20F-3-0000	B1-13	C	X	O	No	No	No				0.5		FF	2
2530	20F-3-0000	B1-13	C	Z	O	No	No	No				0.5		F	2
2532	20F-3-0000	B1-13	C	C	T	No	No	No				1		FF	4
2533	20F-3-0000	B1-13	C	C	T	No	No	No				1		F	2
2534	20F-3-0000	B1-13	C	C	T	No	No	No				19		F	2
2535	20F-3-0000	B1-13	C	C	T	No	No	No				7		FF	3
2536	20F-3-0000	B1-13	C	C	O	No	No	No				3		FF	2
2537	20F-3-0000	B1-13	C	X	O	No	No	No				12		F	4
2538	20F-3-0000	B1-13	C	X	T	No	No	No				94		F	4
2539	20A-15-0000	B1-13	C	X	O	No	No	No				12		F	3
2540	20A-15-0000	B1-13	C	X	T	No	No	No				4		F	3
2541	20A-15-0000	B1-13	C	X	T	No	No	No				2		F	3
2542	20A-15-0000	B1-13	C	X	T	No	No	No				3		FF	2
2543	20A-15-0000	B1-13	C	X	T	No	No	No				2		F	2
2544	20A-15-0000	B1-13	C	X	T	No	No	No				0.5		FF	1
2545	20A-15-0000	B1-13	Z	Z	O	No	No	No				9		FF	3
2547	20A-15-0000	B1-13	C	D	O	No	No	No				0.5		FF	2
2551	20A-15-0000	B1-13	C	C	O	No	No	No				41		F	4
2552	20A-15-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2553	20A-15-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2554	20A-15-0000	B1-13	C	C	T	No	No	No				0.5		FF	2
2556	20A-15-0000	B1-13	C	C	T	No	No	No				2		FF	3
2557	20A-15-0000	B1-13	C	C	T	No	No	No				3		FF	2
2558	20A-15-0000	B1-13	C	C	T	No	No	No				9		FF	2
2559	20A-15-0000	B1-13	C	C	T	No	No	No				2		FF	3
2560	20A-15-0000	B1-13	C	C	T	No	No	No				7		FF	2
2580	20A-15-0000	B1-13	C	D	O	No	No	No				0.5		F	2
2587	20A-15-0000	B1-13	C	C	T	No	No	No				2		FF	2
2588	20A-15-0000	B1-13	C	C	O	No	No	No				13		F	3
2589	20A-15-0000	B1-13	C	X	T	No	No	No				0.5		FF	3
2590	20A-15-0000	B1-13	C	X	T	No	No	No				7		FF	2
2595	20A-15-0000	B1-13	C	X	O	No	No	No				6		FF	3
2596	20A-15-0000	B1-13	C	C	O	No	No	No				10		FF	3
2597	20J-20-0000	B1-13	C	D	T	No	No	No				199		C	4
2598	20J-20-0000	B1-13	C	X	T	No	No	No				113		K	4

2607	20J-20-0000	B1-13	C	X	T	No	No	No					2		FF	2
2608	20J-20-0000	B1-13	C	D	T	No	No	No					4		F	3
2609	20J-20-0000	B1-13	C	D	O	No	No	No					0.5		FF	1
2610	20J-20-0000	B1-13	C	D	O	No	No	No					2		FF	1
2611	20J-20-0000	B1-13	C	C	T	No	No	No					30		FF	4
2614	20J-20-0000	B1-13	C	C	T	No	No	No					5		FF	2
2615	20J-20-0000	B1-13	C	C	T	No	No	No					3		F	2
2616	20J-20-0000	B1-13	C	C	T	No	No	No					0.5		FF	2
2617	20J-20-0000	B1-13	C	C	T	No	No	No					4		F	2
2620	20J-20-0000	B1-13	C	C	T	No	No	No					3		FF	2
2621	20J-20-0000	B1-13	C	C	O	No	No	No					2		FF	2
2622	20J-20-0000	B1-13	C	C	T	No	No	No					2		FF	2
2627	20F-3-0000	B1-13	C	D	O	No	No	No					82		F	4
2628	20F-3-0000	B1-13	C	D	T	No	No	No					8		F	3
2629	20F-3-0000	B1-13	C	D	T	No	No	No					5		F	2
2631	20F-3-0000	B1-13	Z	Z	O	No	No	No					3		HF	2
2632	20F-3-0000	B1-13	Z	Z	O	No	No	No					0.5		HF	3
2633	20F-3-0000	B1-13	C	Z	O	No	No	No					24		FF	3
2634	20F-3-0000	B1-13	C	W	O	No	No	No					4		F	2
2639	20F-3-0000	B1-13	C	X	O	No	No	No					23		FF	4
2640	20F-3-0000	B1-13	C	X	O	No	No	No					6		FF	2
2641	20F-3-0000	B1-13	C	X	O	No	No	No					7		F	2
2642	20F-3-0000	B1-13	C	W	O	No	No	No					9		F	3
2647	19D-6-0000	B1-02	C	W	T	No	No	No					1		F	2
2648	19D-6-0000	B1-02	C	X	T	No	No	No					2		FF	2
2650	19D-6-0000	B1-02	C	C	T	No	No	No	50.93	26.18	24.13		29	S	FF	3
2652	19D-6-0000	B1-02	C	C	O	No	No	No					11		FF	3
2653	19D-6-0000	B1-02	C	C	T	No	No	No					9		F	2
2655	19D-6-0000	B1-02	C	C	T	No	No	No	32.25	26.33	6.98		8	C	F	2
2656	19D-6-0000	B1-02	C	C	T	No	No	No	34.15	22.36	7.53		4	C	F	2
2657	19D-6-0000	B1-02	C	C	T	No	No	No					11		F	2
2658	19D-6-0000	B1-02	C	C	O	No	No	No					3		FF	3
2659	19D-6-0000	B1-02	C	C	T	No	No	No					4		FF	3
2660	19D-6-0000	B1-02	C	C	T	No	No	No					1		FF	2
2662	19D-6-0000	B1-02	C	C	T	No	No	No					2		FF	2
2663	19D-6-0000	B1-02	C	C	T	No	No	No					1		FF	2
2664	19D-6-0000	B1-02	C	C	T	No	No	No					0.5		FF	2
2666	19D-6-0000	B1-02	C	C	T	No	No	No					13		F	4
2669	19D-6-0000	B1-02	C	D	T	No	No	No	90.02	69.89	51.83		448		H	4
2670	19D-6-0000	B1-02	C	X	T	No	No	No					5		F	2
2671	19D-6-0000	B1-02	C	W	O	No	No	No					13		FF	3
2673	19D-6-0000	B1-02	C	X	T	No	No	No					2		F	2
2674	19D-6-0000	B1-02	C	X	T	No	No	No					6		F	2
2675	19D-6-0000	B1-02	C	X	T	No	No	No	25.29	15.47	5.45		1	D	FF	2
2676	19D-6-0000	B1-02	C	X	T	No	No	No					3		FF	2
2677	19D-6-0000	B1-02	C	X	T	No	No	No					0.5		F	2
2678	19D-6-0000	B1-02	C	X	T	No	No	No					0.5		F	2
2680	19D-6-0000	B1-02	C	X	O	No	No	No	54.05	45.44	14.25		27	C	F	4
2683	20B-13-0000	B1-13	C	C	T	No	No	No					22		FF	3
2684	20B-13-0000	B1-13	C	C	T	No	No	No					6		FF	2
2685	20B-13-0000	B1-13	C	C	T	No	No	No					3		FF	2
2688	20B-13-0000	B1-13	C	C	T	No	No	No	23.87	17.77	5.67		7	C	F	2
2692	20A-15-0000	B1-13	C	D	T	No	No	No					3		F	2
2693	20A-15-0000	B1-13	C	D	T	No	No	No					3		F	2

2694	20A-15-0000	B1-13	C	W	T	No	No	No	61.17	42.71	20.36	43	C	F	4
2695	20A-15-0000	B1-13	C	W	T	No	No	No				30		F	4
2696	20A-15-0000	B1-13	C	Z	O	No	No	No				30		FF	4
2697	20A-15-0000	B1-13	C	X	O	No	No	No				42		F	4
2698	20A-15-0000	B1-13	C	X	O	No	No	No				12		F	4
2700	20A-15-0000	B1-13	C	X	O	No	No	No				8		FF	2
2701	20A-15-0000	B1-13	C	X	O	No	No	No				11		FF	3
2702	20A-15-0000	B1-13	C	X	O	No	No	No				13		FF	3
2703	20A-15-0000	B1-13	C	X	O	No	No	No				4		F	2
2717	20A-15-0000	B1-13	C	T	No	No	No	No				2		F	2
2723	20B-13-0000	B1-13	C	C	T	No	No	No				1		F	2
2724	20B-13-0000	B1-13	C	C	T	No	No	No				13		F	4
2725	20B-13-0000	B1-13	C	C	T	No	No	No				3		FF	3
2726	20B-13-0000	B1-13	C	C	T	No	No	No				15		FF	3
2727	20B-13-0000	B1-13	C	C	T	No	No	No				2		FF	1
2728	20B-13-0000	B1-13	C	X	O	No	No	No				2		FF	2
2729	20B-13-0000	B1-13	C	C	T	No	No	No				7		FF	2
2730	20B-13-0000	B1-13	C	C	T	No	No	No				11		FF	3
2731	20B-13-0000	B1-13	C	C	T	No	No	No				30		FF	4
2732	20B-13-0000	B1-13	C	X	T	No	No	No				21		FF	4
2733	20B-13-0000	B1-13	C	C	T	No	No	No				7		FF	2
2734	20B-13-0000	B1-13	C	C	T	No	No	No				4		FF	2
2735	20B-13-0000	B1-13	C	C	O	No	No	No				10		FF	3
2736	20B-13-0000	B1-13	C	C	T	No	No	No				32		FF	3
2737	20B-13-0000	B1-13	C	C	T	No	No	No				8		FF	4
2738	20B-13-0000	B1-13	C	C	T	No	No	No				16		F	4
2739	20B-13-0000	B1-13	C	C	T	No	No	No				13		F	3
2740	20B-13-0000	B1-13	C	C	T	No	No	No				52		F	4
2743	20B-13-0000	B1-13	C	C	O	No	No	No				13		F	4
2747	20B-13-0000	B1-13	C	C	T	No	No	No				2		F	2
2748	20B-13-0000	B1-13	C	C	T	No	No	No				2		F	2
2749	20B-13-0000	B1-13	C	C	T	No	No	No				7		F	2
2750	20B-13-0000	B1-13	C	C	T	No	No	No	28.39	17.38	5.37	4	C	F	2
2751	20B-13-0000	B1-13	C	C	T	No	No	No				3		FF	3
2753	20B-13-0000	B1-13	C	C	T	No	No	No	36.24	20.45	8.08	5	C	F	3
2755	20B-13-0000	B1-13	C	C	T	No	No	No				2		FF	2
2756	20B-13-0000	B1-13	C	C	T	No	No	No				5		FF	3
2758	20B-13-0000	B1-13	C	C	T	No	No	No				6		F	2
2759	20B-13-0000	B1-13	C	C	T	No	No	No				12		F	3
2760	20B-13-0000	B1-13	C	C	T	No	No	No				14		F	4
2764	20B-13-0000	B1-13	C	C	T	No	No	No				13		F	4
2766	20B-13-0000	B1-13	C	C	T	No	No	No				9		F	3
2767	20B-13-0000	B1-13	C	C	T	No	No	No				22		F	3
2769	20B-13-0000	B1-13	C	C	T	No	No	No				4		FF	2
2770	20B-13-0000	B1-13	C	C	T	No	No	No				5		F	2
2771	20B-13-0000	B1-13	C	C	T	No	No	No				6		FF	3
2772	20B-13-0000	B1-13	C	C	T	No	No	No				9		F	3
2773	20B-13-0000	B1-13	C	C	T	No	No	No				4		F	2
2774	20B-13-0000	B1-13	C	C	T	No	No	No				2		F	2
2775	20B-13-0000	B1-13	C	C	O	No	No	No				6		F	3
2776	20B-13-0000	B1-13	C	C	T	No	No	No				3		FF	2
2779	20B-13-0000	B1-13	C	W	O	No	No	No				40		F	4
2780	20B-13-0000	B1-13	C	P	O	No	No	No				52		F	4
2781	20B-13-0000	B1-13	C	X	O	No	No	No				7		FF	2

2782	20B-13-0000	B1-13	C	X	O	No	No	No				8		F	3
2801	20B-13-0000	B1-13	C	C	T	No	No	No				68		F	4
2803	20B-13-0000	B1-13	C	C	O	No	No	No				71		C	3
2808	20B-13-0000	B1-13	C	C	O	No	No	No				20		F	3
2809	20B-13-0000	B1-13	C	C	O	No	No	No				27		F	4
2810	20B-13-0000	B1-13	C	C	O	No	No	No				18		F	4
2812	20B-13-0000	B1-13	C	C	T	No	No	No	47.29	38.43	6.91	12	C	F	4
2813	20B-10-0000	B1-13	C	C	T	No	No	No	50.91	27.47	20.09	25	C	F	4
2814	20B-10-0000	B1-13	C	C	T	No	No	No				8		FF	3
2815	20B-10-0000	B1-13	C	C	T	No	No	No				6		FF	2
2816	20B-10-0000	B1-13	C	C	T	No	No	No				2		F	2
2817	20B-10-0000	B1-13	C	C	T	No	No	No				2		FF	2
2819	20B-10-0000	B1-13	C	C	T	No	No	No				4		F	3
2821	20B-10-0000	B1-13	C	C	T	No	No	No				6		F	2
2822	20B-10-0000	B1-13	C	C	T	No	No	No				0.5		F	2
2823	20B-10-0000	B1-13	C	C	T	No	No	No				1		FF	2
2824	20B-10-0000	B1-13	C	C	T	No	No	No				4		FF	3
2825	20B-10-0000	B1-13	C	C	O	No	No	No				3		F	2
2826	20B-10-0000	B1-13	C	C	T	No	No	No				3		FF	2
2827	20B-10-0000	B1-13	C	C	T	No	No	No				1		FF	2
2828	20B-10-0000	B1-13	C	C	T	No	No	No				1		FF	2
2829	20B-10-0000	B1-13	C	C	T	No	No	No				1		FF	2
2830	20B-10-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2831	20B-10-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2832	20B-10-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
2834	20B-13-0000	B1-13	C	W	O	No	No	No	25.8	18.91	4.15	2	C	F	2
2835	20B-13-0000	B1-13	C	W	O	No	No	No				8		FF	2
2836	20B-13-0000	B1-13	C	X	T	No	No	No				6		F	3
2837	20B-13-0000	B1-13	C	X	T	No	No	No				5		FF	2
2838	20B-13-0000	B1-13	C	X	T	No	No	No				2		F	2
2839	20B-13-0000	B1-13	C	X	T	No	No	No				7		F	3
2840	20B-13-0000	B1-13	C	D	T	No	No	No				24		FB	4
2841	20B-13-0000	B1-13	C	D	T	No	No	No				29		F	4
2844	20B-13-0000	B1-13	C	D	T	No	No	No				143		C	4
2845	20B-13-0000	B1-13	C	D	T	No	No	No	36.39	35.95	6.35	11	C	F	3
2846	20B-13-0000	B1-13	C	C	O	No	No	No				97	B	F	4
2847	20B-13-0000	B1-13	C	D	T	No	No	No				1		FF	1
2851	20B-10-0000	B1-13	C	G	T	No	No	No				2		FF	2
2852	20B-10-0000	B1-13	C	G	T	No	No	No				2		FF	3
2853	20B-10-0000	B1-13	C	Z	O	No	No	No				0.5		F	2
2854	20B-10-0000	B1-13	C	Z	O	No	No	No				0.5		FF	2
2855	20B-10-0000	B1-13	C	Z	T	No	No	No				7		F	2
2872	20B-10-0000	B1-13	C	C	O	No	No	No				8		F	3
2875	20B-10-0000	B1-13	C	C	O	No	No	No				7		F	2
2877	20B-10-0000	B1-13	C	X	O	No	No	No				2		FF	2
2879	20B-10-0000	B1-13	C	X	O	No	No	No				22		F	3
2880	20B-10-0000	B1-13	C	X	O	No	No	No				2		FF	2
2881	20B-10-0000	B1-13	C	X	T	No	No	No				2		FB	4
2883	20B-10-0000	B1-13	C	C	T	No	No	No				14		F	3
2885	20B-11-0000	B1-13	C	X	O	No	No	No				2		F	2
2886	20B-11-0000	B1-13	C	X	O	No	No	No				4		F	2
2887	20B-11-0000	B1-13	C	X	O	No	No	No				3		FF	2
2888	20B-11-0000	B1-13	C	X	O	No	No	No				2		FF	3
2889	20B-11-0000	B1-13	C	X	O	No	No	No				1		F	2

2890	20B-11-0000	B1-13	C	X	O	No	No	No	23.08	20.74	5.1	2	C	F	2
2892	20B-11-0000	B1-13	C	X	O	No	No	No	28.82	22.18	7.8	5	C	F	2
2893	20B-11-0000	B1-13	C	X	O	No	No	No	32.38	7.64	4.73	2	D	F	2
2895	20B-11-0000	B1-13	C	X	O	No	No	No				1		FF	2
2896	20B-11-0000	B1-13	C	X	O	No	No	No				3		FF	2
2897	20B-11-0000	B1-13	C	X	O	No	No	No				14		F	3
2901	20B-11-0000	B1-13	C	C	T	No	No	No	40.22	24.52	12.33	13	S	F	3
2903	20B-11-0000	B1-13	C	X	O	No	No	No				9		F	2
2904	20B-11-0000	B1-13	C	C	T	No	No	No				14		F	2
2905	20B-11-0000	B1-13	C	C	T	No	No	No				7		F	2
2906	20B-11-0000	B1-13	C	C	T	No	No	No				3		FF	2
2907	20B-11-0000	B1-13	C	C	T	No	No	No				11		F	2
2908	20B-11-0000	B1-13	C	C	T	No	No	No				2		F	2
2909	20B-11-0000	B1-13	C	C	T	No	No	No				6		FF	2
2910	20B-11-0000	B1-13	C	C	T	No	No	No				12		F	2
2911	20B-11-0000	B1-13	C	C	T	No	No	No				4		FF	3
2912	20B-11-0000	B1-13	C	C	T	No	No	No				8		FF	3
2913	20B-11-0000	B1-13	C	C	T	No	No	No				6		F	3
2914	20B-11-0000	B1-13	C	C	T	No	No	No				7		F	2
2916	20B-11-0000	B1-13	C	C	T	No	No	No	35.05	24.1	15.71	11	C	F	2
2917	20B-11-0000	B1-13	C	C	T	No	No	No				4		F	2
2918	20B-11-0000	B1-13	C	C	T	No	No	No	44.1	36.01	11.17	15	D	F	3
2920	20B-11-0000	B1-13	C	C	T	No	No	No				3		F	2
2926	20A-18-0000	B1-13	C	R	T	No	No	No				2		FF	1
2929	20A-18-0000	B1-13	C	R	O	No	No	No				1		FF	2
2934	20A-18-0000	B1-13	C	C	O	No	No	No				13		F	3
2935	20A-18-0000	B1-13	C	C	T	No	No	No				13		F	3
2937	20A-18-0000	B1-13	C	C	T	No	No	No				3		F	2
2938	20A-18-0000	B1-13	C	C	T	No	No	No				14		F	4
2939	20A-18-0000	B1-13	C	C	O	No	No	No				8		F	4
2940	20A-18-0000	B1-13	C	C	O	No	No	No				9		F	3
2942	20A-18-0000	B1-13	C	C	O	No	No	No				5		F	2
2943	20A-18-0000	B1-13	C	C	T	No	No	No				3		F	2
2944	20A-18-0000	B1-13	C	C	T	No	No	No				1		F	2
2945	20A-18-0000	B1-13	C	C	T	No	No	No				5		F	2
2947	20A-18-0000	B1-13	C	C	O	No	No	No				3		FF	2
2948	20A-18-0000	B1-13	C	C	T	No	No	No				12		FF	3
2949	20A-18-0000	B1-13	C	C	T	No	No	No				5		FF	2
2951	20B-11-0000	B1-13	C	D	T	No	No	No				15		FF	3
2952	20B-11-0000	B1-13	C	G	T	No	No	No	33.7	29.34	7.27	8	C	F	3
2953	20B-11-0000	B1-13	C	W	T	No	No	No				24		F	3
2954	20B-11-0000	B1-13	C	C	T	No	No	No				7		FF	3
2955	20B-11-0000	B1-13	C	X	O	No	No	No				5		F	3
2956	20B-11-0000	B1-13	C	X	T	No	No	No	23.9	13.31	2.68	1	C	F	2
2958	20A-15-0000	B1-13	C	C	T	No	No	No				10		F	3
2960	20A-15-0000	B1-13	C	C	T	No	No	No				6		F	3
2961	20A-15-0000	B1-13	C	C	T	No	No	No				14		FF	2
2962	20A-15-0000	B1-13	C	C	T	No	No	No				6		F	3
2963	20A-15-0000	B1-13	C	C	T	No	No	No	42.1	28.09	5.03	6	C	F	3
2966	20A-15-0000	B1-13	C	C	T	No	No	No				4		F	3
2967	20A-15-0000	B1-13	C	C	T	No	No	No				3		FB	3
2968	20A-15-0000	B1-13	C	C	T	No	No	No				3		F	3
2969	20A-15-0000	B1-13	C	C	T	No	No	No				2		F	1
2970	20A-15-0000	B1-13	C	C	T	No	No	No				1		F	2

2971	20A-15-0000	B1-13	C	C	T	No	No	No				6		F	2
2973	20A-15-0000	B1-13	C	C	T	No	No	No				4		FF	3
2976	20A-15-0000	B1-13	C	C	T	No	No	No				2		FF	2
2977	20A-15-0000	B1-13	C	C	T	No	No	No				4		F	2
2978	20A-15-0000	B1-13	C	C	T	No	No	No				2		F	2
2979	20A-15-0000	B1-13	C	C	T	No	No	No				3		F	2
2981	20A-15-0000	B1-13	C	C	T	No	No	No				1		FF	2
2988	20A-18-0000	B1-13	C	X	O	No	No	No				6		F	2
2995	20A-15-0000	B1-13	C	D	T	No	No	No				3		FF	2
2996	20A-15-0000	B1-13	Q	C	T	No	No	No				26		F	4
2997	20A-15-0000	B1-13	C	G	O	No	No	No				2		FF	2
2998	20A-15-0000	B1-13	C	G	O	No	No	No				6		F	3
3015	20A-15-0000	B1-13	C	C	O	No	No	No				0.5		FF	2
3020	20A-15-0000	B1-13	C	X	O	No	No	No				22		F	4
3021	20A-15-0000	B1-13	C	X	O	No	No	No				5		F	3
3022	20A-15-0000	B1-13	C	X	O	No	No	No				7		FB	4
3023	20A-15-0000	B1-13	C	X	O	No	No	No				52		FF	4
3024	20A-15-0000	B1-13	C	X	O	No	No	No				8		F	3
3025	20A-15-0000	B1-13	C	X	T	No	No	No				6		F	3
3026	20A-15-0000	B1-13	C	C	T	No	No	No				113		K	4
3027	20A-15-0000	B1-13	C	C	T	No	No	No				101		K	4
3028	20A-15-0000	B1-13	C	C	T	No	No	No	48.86	7.83	26.65	92	S	K	4
3029	20B-11-0000	B1-13	C	C	T	No	No	No				3		FF	2
3032	20B-11-0000	B1-13	C	C	O	No	No	No				2		FF	2
3033	20B-11-0000	B1-13	C	C	O	No	No	No				16		F	3
3036	20B-11-0000	B1-13	C	C	T	No	No	No				2		FF	2
3037	20B-11-0000	B1-13	C	C	T	No	No	No				2		F	2
3039	20B-11-0000	B1-13	C	C	T	No	No	No				3		FF	2
3041	20B-11-0000	B1-13	C	C	T	No	No	No				2		FF	2
3042	20B-11-0000	B1-13	C	C	T	No	No	No	34.24	15.26	5.8	3	C	F	3
3044	20B-11-0000	B1-13	C	C	T	No	No	No				3		F	2
3045	20B-11-0000	B1-13	C	C	T	No	No	No	20.64	15.62	6.23	3	C	FF	2
3047	20B-11-0000	B1-13	C	C	T	No	No	No				2		F	2
3048	20B-11-0000	B1-13	C	C	T	No	No	No				1		FF	2
3049	20B-11-0000	B1-13	C	C	T	No	No	No				2		FF	2
3050	20B-11-0000	B1-13	C	C	T	No	No	No				2		F	2
3051	20B-11-0000	B1-13	C	C	T	No	No	No				6		F	2
3052	20B-11-0000	B1-13	C	C	T	No	No	No				1		FF	2
3053	20B-11-0000	B1-13	C	C	T	No	No	No				1		FF	2
3054	20B-11-0000	B1-13	C	C	T	No	No	No				1		F	2
3056	20B-11-0000	B1-13	C	C	T	No	No	No				2		FF	2
3057	20B-11-0000	B1-13	C	C	T	No	No	No				1		FF	2
3059	20B-11-0000	B1-13	C	C	T	No	No	No				1		F	2
3068	20B-11-0000	B1-13	C	C	T	No	No	No				12		F	3
3069	20B-11-0000	B1-13	C	D	T	No	No	No				38		F	3
3071	20B-11-0000	B1-13	C	R	T	No	No	No				3		F	2
3082	20B-11-0000	B1-13	C	G	O	No	No	No				12		F	2
3091	20B-11-0000	B1-13	C	C	T	No	No	No				7		F	2
3092	20B-11-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
3096	20B-11-0000	B1-13	C	X	O	No	No	No				2		FF	2
3114	20J-20-0000	B1-13	C	R	T	No	No	No				0.5		F	1
3118	20J-20-0000	B1-13	C	D	T	No	No	No				86		FB	4
3119	20J-20-0000	B1-13	C	C	T	No	No	No				9		F	3
3122	20J-20-0000	B1-13	C	C	T	No	No	No				13		F	4

3123	20J-20-0000	B1-13	C	C	T	No	No	No				36		F	4
3125	20J-20-0000	B1-13	C	C	T	No	No	No				2		FF	2
3126	20J-20-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
3127	20J-20-0000	B1-13	C	C	T	No	No	No				3		FF	2
3128	20J-20-0000	B1-13	C	C	T	No	No	No				0.5		F	1
3129	20J-20-0000	B1-13	C	C	O	No	No	No				3		FF	3
3130	20J-20-0000	B1-13	C	C	T	No	No	No				4		FF	2
3131	20J-20-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
3133	20J-20-0000	B1-13	C	C	T	No	No	No				3		FF	1
3134	20J-20-0000	B1-13	C	C	T	No	No	No				0.5		FF	1
3135	20J-20-0000	B1-13	C	C	T	No	No	No				7		F	3
3136	20J-20-0000	B1-13	C	C	T	No	No	No				2		F	1
3137	20J-20-0000	B1-13	C	C	T	No	No	No				4		F	2
3144	20A-15-0000	B1-13	C	X	T	No	No	No				0.5		FF	1
3147	20D-23-978	B1-08	C	C	T	No	No	No				0.5		FF	2
3148	20D-23-978	B1-08	C	C	T	No	No	No				0.5		FF	1
3149	20D-23-978	B1-08	Q	C	T	No	No	No				0.5		FF	2
3150	20D-23-978	B1-08	C	C	T	No	No	No				0.5		FF	3
3151	20B-11-996	B1-13	C	W	O	No	No	No				0.5		FF	3
3152	20B-11-996	B1-13	C	C	T	No	No	No				3		FF	2
3153	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	2
3154	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	1
3155	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	2
3156	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	1
3157	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	1
3158	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	1
3159	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	1
3160	20B-11-996	B1-13	C	C	T	No	No	No				0.5		FF	1
3161	20B-11-996	B1-13	C	C	T	No	No	No	22.04	6.99	5.43	0.5	D	FF	2
3162	20B-11-996	B1-13	C	W	O	No	No	No				2		FF	3
3163	20B-11-996	B1-13	C	X	T	No	No	No				0.5		FF	2
3164	20B-11-996	B1-13	C	X	O	No	No	No				2		FF	2
3168	20B-11-996	B1-13	C	X	O	No	No	No	23.56	6.71	2.61	2	D	FF	2
3169	20B-11-996	B1-13	Q	Z	O	No	No	No				3		FF	2
3170	20B-11-996	B1-13	C	C	T	No	No	No	34.96	5.9	3.11	0.5	D	FF	3
3176	15N-85-0000	B1-05	O	B	T	No	No	No	30.93	13.66	3.65	2	S	PPB	2
3177	15N-85-0000	B1-05	O	B	T	No	No	No	15.95	14.17	3.29	0.5		PPB	2
3178	15N-85-0000	B1-05	O	B	T	No	No	No	49.22	10.29	3	3	C	PPB	4
3179	15N-85-0000	B1-05	O	B	T	No	No	No	16.68	10.79	2.38	0.5	C	MPB	1
3186	15N-91-497	B1-05	O	B	T	No	No	No	17.62	10.87	2.22	2		MPB	3
3187	15N-91-497	B1-05	O	B	T	No	No	No	61.43	11.53	2.68	3	C	PPB	4
3194	15N-85-490	B1-05	O	B	T	No	No	No	18.61	7.08	3.04	0.5		MPB	2
3195	15N-85-490	B1-05	O	B	T	No	No	No	43.47	8.51	2.49	0.5		PPB	3
3201	15N-116-457	B1-04	O	B	T	No	No	No	28.02	11.69	2.31	0.5	C	MPB	2
3202	15N-116-457	B1-04	O	B	T	No	No	No	25.53	11.02	2.49	0.5	C	MPB	2
3211	20B-10-932	B1-13	C	C	T	No	No	No	56.6	39.3	10.28	27	C	F	4
3212	20B-10-932	B1-13	C	C	T	No	No	No				11		FF	4
3213	20B-10-932	B1-13	C	X	T	No	No	No				2		FF	2
3214	20A-14-1027	B1-05	C	C	T	No	No	No				0.5		FF	2
3215	20A-14-1027	B1-05	C	D	T	No	No	No				3		FF	2
3216	20B-11-994	B1-13	C	C	T	No	No	No	19.03	4.35	4.06	0.5	D	FF	2
3217	20B-11-994	B1-13	C	C	T	No	No	No	21.91	8.01	4.81	0.5	D	FF	2
3218	20B-11-994	B1-13	C	C	T	No	No	No				2		FF	2
3219	20B-11-994	B1-13	C	C	T	No	No	No	19.4	3.9	2.3	0.5	D	FF	2

3223	20A-13-906	B1-13	C	C	T	No	No	No					0.5		FF	2
3226	20A-13-901	B1-13	C	C	T	No	No	No	23.31	6.84	4.25		0.5	D	FF	2
3227	20A-13-901	B1-13	C	X	T	No	No	No	22.91	6.67	6.24		0.5	D	FF	2
3228	20A-13-901	B1-13	C	X	T	No	No	No					2		FF	2
3230	20A-13-901	B1-13	C	C	O	No	No	No					0.5		FF	2
3231	20A-13-901	B1-13	C	X	T	No	No	No					0.5		FF	2
3233	20A-13-901	B1-13	C	G	T	No	No	No					0.5		FF	2
3234	20A-13-901	B1-13	C	C	O	No	No	No					0.5		FF	1
3236	20A-13-901	B1-13	C	X	T	No	No	No					7		FF	2
3237	20A-13-901	B1-13	C	X	T	No	No	No					0.5		FF	1
3239	20A-13-904	B1-13	C	C	T	No	No	No	20.53	5.09	4.2		0.5	D	FF	2
3240	20A-13-904	B1-13	C	C	T	No	No	No	28.1	5.28	3.6		0.5	D	FF	2
3243	20B-11-997	B1-13	C	X	T	No	No	No					0.5		FF	2
3244	20A-17-992	B1-05	C	C	T	No	No	No					0.5		FF	2
3245	20A-17-992	B1-05	C	C	T	No	No	No	26.23	9.4	6.66		0.5	B	FF	2
3280	20F-3-0000	B1-13	C	R	O	No	No	No					3		FF	3
3281	20F-3-0000	B1-13	C	R	T	No	No	No					15		F	3
3289	20F-3-0000	B1-13	C	C	T	No	No	No					24		F	4
3290	20F-3-0000	B1-13	C	C	T	No	No	No					13		F	3
3293	20F-3-0000	B1-13	C	C	O	No	No	No					22		F	3
3294	20F-3-0000	B1-13	C	C	T	No	No	No					6		FF	4
3295	20F-3-0000	B1-13	C	C	O	No	No	No					14		FF	3
3296	20F-3-0000	B1-13	C	C	T	No	No	No					5	B	FF	2
3297	20F-3-0000	B1-13	C	C	T	No	No	No					4		F	3
3299	20F-3-0000	B1-13	C	X	O	No	No	No					5		FF	3
3300	20F-3-0000	B1-13	C	C	T	No	No	No					2		FF	2
3301	20F-3-0000	B1-13	C	C	T	No	No	No					6		FF	2
3302	20F-3-0000	B1-13	C	C	O	No	No	No					4		FF	2
3303	20F-3-0000	B1-13	C	C	T	No	No	No					5		FF	2
3305	20F-3-0000	B1-13	C	X	O	No	No	No					5		FF	2
3307	20F-3-0000	B1-13	C	C	T	No	No	No					0.5		FF	2
3308	20F-3-0000	B1-13	C	R	T	No	No	No					4		FF	2
3312	20A-13-0000	B1-13	C	D	T	No	No	No					2		FF	2
3313	20A-13-0000	B1-13	C	X	O	No	No	No					2		F	2
3314	15N-138-0000	B1-05	C	X	T	No	No	No					4		FF	2
3315	15N-138-0000	B1-05	C	X		No	No	No					2		F	2
3316	15N-138-0000	B1-05	C	C	T	No	No	No					36		FF	3
3318	15N-138-0000	B1-05	C	C	O	No	No	No	30.81	24.14	6.08		4	C	F	2
3319	15N-138-0000	B1-05	C	X	O	No	No	No					4		FF	2
3322	15N-138-0000	B1-05	C	C	T	No	No	No					0.5		F	2
3323	15N-138-0000	B1-05	C	C	T	No	No	No					4		FF	2
3325	15N-138-0000	B1-05	C	C	T	No	No	No					0.5		FF	2
3326	15N-138-0000	B1-05	C	C	T	No	No	No					0.5		F	2
3327	15N-138-0000	B1-05	C	X	O	No	No	No					0.5		FF	2
3331	15N-138-0000	B1-05	C	C	O	No	No	No					63		K	4
3332	15N-138-0000	B1-05	L	X	P	No	No	No					13		FF	3
3333	15N-126-0000	B1-05	C	C	T	No	No	No					4		FF	2
3334	15N-126-0000	B1-05	C	C	T	No	No	No					4		FF	2
3335	15N-126-0000	B1-05	C	X	O	No	No	No					2		FF	1
3336	15N-126-0000	B1-05	C	C	T	No	No	No					2		FF	2
3338	15N-126-0000	B1-05	C	R	T	No	No	No					0.5		FF	1
3360	15N-138-0000	B1-05	C	C	T	No	No	No	42.1	32.23	8.98		11	C	F	3
3361	15N-138-0000	B1-05	C	C	T	No	No	No					3		F	2
3362	15N-138-0000	B1-05	C	C	T	No	No	No					7		FF	3

3364	15N-138-0000	B1-05	C	C	T	No	No	No				0.5		FF	2
3366	15N-138-0000	B1-05	C	C	T	No	No	No				40		K	4
3373	15N-122-0000	B1-04	C	C	O	No	No	No				4		FF	3
3374	15N-122-0000	B1-04	C	X	T	No	No	No	52.89	38.75	10.63	130	C	FF	4
3375	15N-141-0000	B1-05	C	G	T	No	No	No	82.94	59.92	23.91	51	S	F	4
3377	15N-141-0000	B1-05	C	C	T	No	No	No				2		FF	2
3378	15N-141-0000	B1-05	C	C	T	No	No	No				0.5		F	2
3381	15N-141-0000	B1-05	C	C	T	No	No	No				9		F	2
3382	15N-141-0000	B1-05	C	C	O	No	No	No				2		F	2
3388	15N-141-0000	B1-05	Q	Z	O	No	No	No				3		HF	2
3389	15N-141-0000	B1-05	C	X	T	No	No	No				3		FF	2
3390	15N-141-0000	B1-05	C	X	O	No	No	No				2		FF	2
3394	15N-126-0000	B1-05	C	C	O	No	No	No				54		C	3
3400	15N-126-0000	B1-05	C	C	T	No	No	No				3		FF	2
3401	15N-126-0000	B1-05	C	X	O	No	No	No				5		FF	3
3402	15N-126-0000	B1-05	C	W	O	No	No	No				7		FF	3
3409	15N-122-0000	B1-04	C	D	T	No	No	No				7		FF	3
3412	15N-122-0000	B1-04	C	C	T	No	No	No				4		FF	3
3414	15N-122-0000	B1-04	C	X	T	No	No	No	35	27.78	7.39	7	C	F	3
3416	15N-122-0000	B1-04	C	C	T	No	No	No				4		F	2
3417	15N-122-0000	B1-04	C	C	T	No	No	No				2		F	2
3418	15N-122-0000	B1-04	C	C	T	No	No	No				2		FF	3
3423	15N-122-0000	B1-04	C	C	O	No	No	No				9		F	3
3424	15N-122-0000	B1-04	C	G	O	No	No	No				35		F	4
3433	15N-137-0000	B1-05	C	X	T	No	No	No				0.5		FF	2
3434	15N-137-0000	B1-05	C	X	T	No	No	No				4		FF	2
3435	15N-137-0000	B1-05	C	X	T	No	No	No	24.36	15.69	4.91	2	C	F	2
3438	15N-137-0000	B1-05	C	C	T	No	No	No				0.5		FF	2
3439	15N-137-0000	B1-05	C	C	T	No	No	No				0.5		F	2
3441	15N-137-0000	B1-05	C	C	O	No	No	No				6		FF	2
3443	15N-137-0000	B1-05	C	X	O	No	No	No				4		FF	2
3455	15N-124-0000	B1-04	C	X	O	No	No	No				17		F	3
3458	15N-124-0000	B1-04	C	W	O	No	No	No				2		FF	2
3459	15N-145-0000	B1-05	C	C	O	No	No	No				226		C	4
3463	15N-145-0000	B1-05	C	X	T	No	No	No				15		F	4
3464	15N-145-0000	B1-05	C	C	O	No	No	No				32		F	4
3465	15N-145-0000	B1-05	C	R	O	No	No	No				22		F	4
3466	15N-145-0000	B1-05	C	D	T	No	No	No				11		FF	3
3467	15N-145-0000	B1-05	C	X	T	No	No	No				6		FF	3
3468	15N-145-0000	B1-05	C	C	T	No	No	No				4		F	2
3471	15N-122-0000	B1-04	C	X	T	No	No	No				7		F	3
3472	15N-122-0000	B1-04	C	X	T	No	No	No				14		F	3
32	20A-21-1047	B1-08	Q	C	T	Yes	No	No				2		F	2
343	20I-6-0000	B1-12	C	C	T	Yes	No	No	31.23	14.68	5.28	2	C	FF	2
350	20I-6-0000	B1-12	C	C	T	Yes	No	No				2		FF	2
360	20I-6-0000	B1-12	C	R	T	Yes	No	No				14		FF	3
361	20I-6-0000	B1-12	C	R	T	Yes	No	No				14		FF	4
362	20I-6-0000	B1-12	C	R	T	Yes	No	No				5		FF	3
363	20I-6-0000	B1-12	C	R	O	Yes	No	No	37.89	21.99	8.61	7	C	FB	3
365	20I-6-0000	B1-12	C	R	T	Yes	No	No				3		FF	2
366	20I-6-0000	B1-12	C	C	T	Yes	No	No				2		FF	2
367	20I-6-0000	B1-12	C	R	T	Yes	No	No				9		K	2
368	20I-6-0000	B1-12	C	R	T	Yes	No	No				2		FF	2
369	20I-6-0000	B1-12	C	R	O	Yes	No	No				9		FF	3

370	20I-6-0000	B1-12	C	R	O	Yes	No	No				4		FF	3
371	20I-6-0000	B1-12	C	R	O	Yes	No	No				12		K	2
372	20I-6-0000	B1-12	C	R	T	Yes	No	No				1		K	2
373	20I-6-0000	B1-12	C	R	T	Yes	No	No				3		K	1
374	20I-6-0000	B1-12	C	R	T	Yes	No	No				3		K	2
375	20I-6-0000	B1-12	C	G	T	Yes	No	No	24.84	17.07	5.96	1	C	FF	2
376	20I-6-0000	B1-12	C	C	T	Yes	No	No				2		FF	1
377	20I-6-0000	B1-12	C	G	O	Yes	No	No				2		K	1
381	20I-11-0000	B1-12	C	G	T	Yes	No	No				2		FF	2
383	20I-11-0000	B1-12	C	R	O	Yes	No	No				5		F	2
384	20I-11-0000	B1-12	C	R	O	Yes	No	No				4		F	2
385	20I-11-0000	B1-12	C	R	T	Yes	No	No				5		F	2
387	20I-11-0000	B1-12	C	R	T	Yes	No	No				3		F	2
388	20I-11-0000	B1-12	C	R	O	Yes	No	No				10		FF	3
389	20I-11-0000	B1-12	C	R	T	Yes	No	No				2		FF	2
390	20I-11-0000	B1-12	C	R	T	Yes	No	No				5		FF	2
391	20I-11-0000	B1-12	C	R	T	Yes	No	No				5		F	2
393	20I-11-0000	B1-12	C	R	T	Yes	No	No				0.5		FF	2
394	20I-11-0000	B1-12	C	W	O	Yes	No	No				0.5		FF	2
432	20I-11-0000	B1-12	C	R	O	Yes	No	No				2		FF	1
433	20I-11-0000	B1-12	C	R	T	Yes	No	No				0.5		FF	1
434	20I-11-0000	B1-12	C	G	O	Yes	No	No				1		FF	1
435	20I-11-0000	B1-12	C	R	T	Yes	No	No				22		FF	3
467	20I-11-0000	B1-12	C	R	T	Yes	No	No				18		F	3
468	20I-11-0000	B1-12	C	R	O	Yes	No	No				13		FF	4
469	20I-11-0000	B1-12	C	R	T	Yes	No	No				4		FF	3
470	20I-11-0000	B1-12	C	R	T	Yes	No	No				5		FF	3
471	20I-11-0000	B1-12	C	C	O	Yes	No	No				11		FF	3
472	20I-11-0000	B1-12	C	G	O	Yes	No	No				6		FF	2
475	20I-11-0000	B1-12	C	R	O	Yes	No	No				2	C	F	2
476	20I-11-0000	B1-12	C	R	T	Yes	No	No				1		FF	2
477	20I-11-0000	B1-12	C	G	O	Yes	No	No	28.42	23.42	6.16	5	C	F	2
478	20I-11-0000	B1-12	C	R	T	Yes	No	No				1		FF	2
479	20I-11-0000	B1-12	C	R	O	Yes	No	No				4		F	2
482	20I-11-0000	B1-12	C	R	T	Yes	No	No				0.5		FF	1
483	20I-11-0000	B1-12	C	R	T	Yes	No	No				2		F	2
484	20I-11-0000	B1-12	C	G	O	Yes	No	No				1		FF	2
485	20I-11-0000	B1-12	C	G	O	Yes	No	No				1		FF	1
486	20I-11-0000	B1-12	C	G	O	Yes	No	No				0.5		FF	1
489	20I-11-0000	B1-12	C	R	O	Yes	No	No				0.5		FF	1
490	20I-11-0000	B1-12	C	R	O	Yes	No	No				4		K	2
513	19D-21-0000	B1-08	C	R	O	Yes	No	No				59		F	4
514	19D-21-0000	B1-08	C	R	T	Yes	No	No	41.69	31.06	11.93	14	C	F	3
515	19D-21-0000	B1-08	C	R	T	Yes	No	No				5		F	2
516	19D-21-0000	B1-08	C	W	O	Yes	No	No				5		FF	2
517	19D-21-0000	B1-08	C	R	T	Yes	No	No				2		F	2
519	19D-21-0000	B1-08	C	R	T	Yes	No	No	26.39	26.15	6.14	3	C	FF	2
546	20I-11-0000	B1-12	C	G	O	Yes	No	No				2		FF	3
547	20I-11-0000	B1-12	C	G	O	Yes	No	No				2		F	1
548	20I-11-0000	B1-12	C	G	O	Yes	No	No				0.5		F	2
549	20I-11-0000	B1-12	C	G	O	Yes	No	No				0.5		F	2
550	20I-11-0000	B1-12	C	W	O	Yes	No	No				0.5		FF	2
551	20I-11-0000	B1-12	C	G	O	Yes	No	No				0.5		F	2
552	20I-11-0000	B1-12	C	G	O	Yes	No	No				0.5		FF	1

555	20I-11-0000	B1-12	C	C	T	Yes	No	No					2		FF	1
556	20I-11-0000	B1-12	C	R	O	Yes	No	No					0.5		FF	1
557	20I-11-0000	B1-12	C	R	T	Yes	No	No					0.5		FF	1
558	20I-11-0000	B1-12	C	R	T	Yes	No	No					0.5		FF	2
559	20I-11-0000	B1-12	C	D	T	Yes	No	No	33.34	30.59	12.72		7	C	F	2
560	20I-11-0000	B1-12	C	R	T	Yes	No	No					0.5		FF	2
580	19D-17-0000	B1-06	C	R	T	Yes	No	No					5		F	2
581	19D-17-0000	B1-06	C	R	T	Yes	No	No					29		F	4
582	19D-17-0000	B1-06	C	R	T	Yes	No	No					7		F	2
583	19D-17-0000	B1-06	C	R	T	Yes	No	No					2		FF	2
584	19D-17-0000	B1-06	C	R	T	Yes	No	No	22.79	13.46	3.22		0.5	B	FF	2
587	19D-20-0000	B1-08	C	R	T	Yes	No	No					0.5		FF	2
588	19D-20-0000	B1-08	C	R	O	Yes	No	No					0.5		F	2
640	19D-15-0000	B1-06	C	Z	O	Yes	No	No					1		FF	2
641	19D-15-0000	B1-06	C	Z	O	Yes	No	No					0.5		FF	1
642	19D-15-0000	B1-06	C	Z	O	Yes	No	No					0.5		FF	1
665	19D-15-0000	B1-06	C	R	O	Yes	No	No					19		F	2
666	19D-15-0000	B1-06	C	R	T	Yes	No	No	21.61	18.61	4.5		4	C	F	2
668	20C-19-0000	B1-07	C	R	O	Yes	No	No	19.39	10.05	2.77		0.5	C	F	2
669	20C-19-0000	B1-07	C	R	O	Yes	No	No					2		FF	2
670	20C-19-0000	B1-07	C	Z	O	Yes	No	No					3		FF	1
671	20C-19-0000	B1-07	C	W	O	Yes	No	No					0.5		FF	2
672	20C-19-0000	B1-07	C	R	T	Yes	No	No					0.5		FF	1
673	20C-19-0000	B1-07	C	R	T	Yes	No	No					0.5		FF	1
674	20C-19-0000	B1-07	C	C	T	Yes	No	No					0.5		FF	2
676	19D-15-0000	B1-06	C	R	T	Yes	No	No					6		FF	2
678	19D-15-0000	B1-06	C	R	T	Yes	No	No					2		FF	2
679	19D-15-0000	B1-06	C	G	O	Yes	No	No					3		FB	2
680	19D-15-0000	B1-06	C	X	T	Yes	No	No					4		F	2
695	20C-19-0000	B1-07	C	G	O	Yes	No	No					12		K	2
696	20C-19-0000	B1-07	C	W	O	Yes	No	No					16		FF	3
698	20C-19-0000	B1-07	C	G	O	Yes	No	No					2		F	2
699	20C-19-0000	B1-07	C	D	T	Yes	No	No					5		FF	2
702	20C-19-0000	B1-07	C	R	O	Yes	No	No					8		K	2
703	20C-19-0000	B1-07	C	G	O	Yes	No	No					2		FF	2
704	20C-19-0000	B1-07	C	R	T	Yes	No	No					4		F	2
705	20C-19-0000	B1-07	C	R	O	Yes	No	No					5		F	3
706	20C-19-0000	B1-07	C	R	T	Yes	No	No					2		F	2
708	20C-19-0000	B1-07	C	R	O	Yes	No	No					1		FF	2
709	20C-19-0000	B1-07	C	R	T	Yes	No	No					1		FF	2
710	20C-19-0000	B1-07	C	R	O	Yes	No	No					6		FF	2
714	20C-19-0000	B1-07	C	R	T	Yes	No	No					0.5		FF	2
717	20C-19-0000	B1-07	C	C	O	Yes	No	No	21.37	18.41	4.67		2	C	F	2
745	20C-19-0000	B1-07	C	D	T	Yes	No	No					1		F	2
747	20C-19-0000	B1-07	C	C	T	Yes	No	No					1		FF	1
752	20C-19-0000	B1-07	C	R	T	Yes	No	No	52.82	31.46	12.34		19	C	F	3
763	20C-19-0000	B1-07	C	G	O	Yes	No	No					3		F	2
791	20C-19-0000	B1-07	C	C	T	Yes	No	No					17		K	3
793	15N-69-0000	B1-04	C	X	O	Yes	No	No					43		K	4
814	15N-69-0000	B1-04	C	R	O	Yes	No	No	45.21	35.1	10.77		13	C	F	4
820	15N-69-0000	B1-04	C	C	T	Yes	No	No					18		F	3
821	15N-69-0000	B1-04	C	W	O	Yes	No	No					26		F	4
822	15N-69-0000	B1-04	C	R	O	Yes	No	No					16		F	4
823	15N-69-0000	B1-04	C	R	T	Yes	No	No					7		FF	4

825	15N-69-0000	B1-04	C	R	O	Yes	No	No				20		F	4
826	15N-69-0000	B1-04	C	G	O	Yes	No	No	40.56	29.36	7.89	11	C	F	3
827	15N-69-0000	B1-04	C	R	O	Yes	No	No				21		FF	4
829	15N-69-0000	B1-04	C	G	O	Yes	No	No				10		K	3
830	15N-69-0000	B1-04	C	R	O	Yes	No	No				11	C	FF	3
836	15N-69-0000	B1-04	C	G	O	Yes	No	No				3		FF	2
871	15N-59-0000	B1-04	C	G	O	Yes	No	No				27		FF	4
872	15N-59-0000	B1-04	C	Z	O	Yes	No	No	29.78	19.05	9.54	8	C	F	3
873	15N-59-0000	B1-04	C	W	O	Yes	No	No				3		FF	2
874	15N-59-0000	B1-04	C	Z	O	Yes	No	No				6		FF	4
885	15N-59-0000	B1-04	C	W	O	Yes	No	No				2	C	FF	2
886	15N-59-0000	B1-04	C	G	O	Yes	No	No				0.5	C	FF	2
887	15N-59-0000	B1-04	C	G	O	Yes	No	No				0.5	C	FF	1
888	15N-59-0000	B1-04	C	G	O	Yes	No	No				0.5	C	FF	1
889	15N-59-0000	B1-04	C	Z	O	Yes	No	No				0.5	C	FF	2
927	15N-42-0000	B1-03-G	C	R	T	Yes	No	No				5		F	2
929	15N-42-0000	B1-03-G	C	C	T	Yes	No	No				2		F	2
930	15N-42-0000	B1-03-G	C	R	O	Yes	No	No				0.5		F	2
939	15N-69-0000	B1-04	C	G	O	Yes	No	No				36		FF	4
940	15N-69-0000	B1-04	C	W	O	Yes	No	No				5		FF	3
946	15N-69-0000	B1-04	C	W	O	Yes	No	No				7		FF	2
1163	15N-42-0000	B1-03-G	C	R	T	Yes	No	No				10		FF	3
1169	15N-42-0000	B1-03-G	C	C	T	Yes	No	No				4	C	FF	3
1170	15N-42-0000	B1-03-G	C	R	T	Yes	No	No				3		FF	2
1177	15N-44-0000	B1-03-H	C	C	T	Yes	No	No	31.49	18.94	8.18	7	C	FF	3
1180	15N-44-0000	B1-03-H	C	C	T	Yes	No	No				3		FF	2
1188	15N-44-0000	B1-03-H	C	W	O	Yes	No	No				25		FB	4
1191	15N-44-0000	B1-03-H	C	W	O	Yes	No	No				24		FF	4
1193	15N-44-0000	B1-03-H	C	R	T	Yes	No	No				7		F	3
1195	15N-44-0000	B1-03-H	C	R	T	Yes	No	No				2		FF	3
1199	15N-44-0000	B1-03-H	C	D	T	Yes	No	No				33		F	4
1201	15N-44-0000	B1-03-H	C	W	O	Yes	No	No				15		FF	3
1202	15N-44-0000	B1-03-H	C	Z	O	Yes	No	No				22		FF	3
1221	15N-44-0000	B1-03-H	C	G	O	Yes	No	No				10		FF	3
1297	20C-19-0000	B1-07	C	R	T	Yes	No	No				0.5		FF	2
1299	20C-19-0000	B1-07	C	R	O	Yes	No	No				0.5		FF	1
1300	20C-19-0000	B1-07	C	G	O	Yes	No	No				0.5		FF	1
1301	20C-19-0000	B1-07	C	D	T	Yes	No	No				2		F	2
1302	20C-19-0000	B1-07	C	Z	O	Yes	No	No				2		F	2
1307	15N-69-0000	B1-04	C	G	O	Yes	No	No				13		F	3
1308	15N-69-0000	B1-04	C	Z	O	Yes	No	No				24		F	3
1319	15N-69-0000	B1-04	C	W	O	Yes	No	No				33	S	FF	4
1352	20C-19-0000	B1-07	C	R	O	Yes	No	No				5		FF	3
1354	20C-19-0000	B1-07	C	R	O	Yes	No	No				9		FF	3
1358	20C-19-0000	B1-07	C	G	O	Yes	No	No				4		FF	2
1359	20C-19-0000	B1-07	C	C	T	Yes	No	No				2		F	2
1360	20C-19-0000	B1-07	C	R	T	Yes	No	No				5		FF	3
1361	20C-19-0000	B1-07	C	R	O	Yes	No	No				0.5		FF	1
1362	20C-19-0000	B1-07	C	R	O	Yes	No	No				0.5		FF	1
1364	20C-19-0000	B1-07	C	R	O	Yes	No	No				0.5		FF	1
1366	20C-19-0000	B1-07	C	R	T	Yes	No	No				0.5		FF	1
1367	20C-3-0000	B1-05	C	W	O	Yes	No	No				6		F	2
1373	20C-3-0000	B1-05	C	W	O	Yes	No	No				17		F	3
1375	20C-3-0000	B1-05	C	R	T	Yes	No	No				13		FF	3

1380	20C-3-0000	B1-05	C	R	O	Yes	No	No				4		F	2
1382	20C-3-0000	B1-05	C	W	O	Yes	No	No				2		F	2
1428	20A-3 C1:2000	B1-04	C	R	T	Yes	No	No				0.5		FF	1
1464	20C-3-0000	B1-05	L	Z	O	Yes	No	No				13		FF	2
1473	20C-3-0000	B1-05	C	R	O	Yes	No	No				6		F	2
1484	20C-3-0000	B1-05	L	Z	O	Yes	No	No				18	C	F	3
1551	20A-6-0000	B1-04	C	R	T	Yes	No	No				40		K	3
1596	20B-12-1273	B1-13	C	C	T	Yes	No	No	23.24	7.5	3.5	1	C	FB	2
1630	20B-12-1273	B1-13	C	C	T	Yes	No	No	23.24	7.5	3.75	1	C	FB	2
1666	20C-1-0000	B1-05	C	R	T	Yes	No	No				21		FF	3
1683	20C-1-0000	B1-05	C	P	O	Yes	No	No	36.95	25.73	9.24	53	C	F	3
1687	20C-1-0000	B1-05	C	R	T	Yes	No	No				3		FF	2
1690	20C-1-0000	B1-05	C	R	O	Yes	No	No				2		FF	2
1691	20C-1-0000	B1-05	C	R	O	Yes	No	No				2		FF	2
1693	20C-5-0000	B1-05	C	G	O	Yes	No	No				3		F	3
1707	20C-5-0000	B1-05	C	W	O	Yes	No	No				4		F	2
1708	20C-5-0000	B1-05	C	R	T	Yes	No	No				2		F	2
1709	20C-5-0000	B1-05	C	R	T	Yes	No	No				7		F	2
1711	20C-5-0000	B1-05	C	G	O	Yes	No	No				5		FF	3
1724	20C-5-0000	B1-05	C	B	O	Yes	No	No				0.5		FF	2
1725	20C-5-0000	B1-05	C	R	T	Yes	No	No				0.5		FF	1
1730	20A-6-0000	B1-04	C	D	T	Yes	No	No				3		F	2
1741	20A-6-0000	B1-04	C	D	O	Yes	No	No				0.5		FF	1
1763	20A-6-0000	B1-04	C	G	O	Yes	No	No				0.5		F	2
1770	20A-6-0000	B1-04	C	Z	O	Yes	No	No				4		FF	2
1772	20A-6-0000	B1-04	C	R	T	Yes	No	No				6		F	2
1774	20A-6-0000	B1-04	C	C	O	Yes	No	No				5		FF	2
1778	20A-6-0000	B1-04	C	R	T	Yes	No	No				7		FF	2
1779	20A-6-0000	B1-04	C	G	O	Yes	No	No				2		FF	1
1781	20A-6-0000	B1-04	C	R	T	Yes	No	No				0.5		F	1
1782	20A-6-0000	B1-04	C	R	T	Yes	No	No				0.5		FF	1
1784	20A-6-0000	B1-04	C	R	T	Yes	No	No				2		FF	2
1785	20A-6-0000	B1-04	C	R	T	Yes	No	No				0.5		FF	1
1786	20A-6-0000	B1-04	C	W	O	Yes	No	No	15.19	9.29	8.13	0.5		FF	1
1787	20A-6-0000	B1-04	C	R	O	Yes	No	No	21.54	12.19	4.16	0.5		FF	1
1789	20A-6-0000	B1-04	C	R	T	Yes	No	No	19.48	8.12	9.35	0.5		FF	1
1790	20A-6-0000	B1-04	C	R	T	Yes	No	No	12.74	10.11	3.2	0.5		FF	1
1791	20A-6-0000	B1-04	C	R	T	Yes	No	No	14.7	10.96	2.15	0.5		FF	1
1792	20A-6-0000	B1-04	C	R	O	Yes	No	No	15.65	7.47	2.53	0.5		FF	1
1793	20A-6-0000	B1-04	C	C	T	Yes	No	No	17.78	10.03	3.77	0.5		FF	1
1801	20D-9-0000	B1-08	C	R	O	Yes	No	No				8		F	2
1808	20D-9-0000	B1-08	C	R	T	Yes	No	No				3		F	2
1813	20D-9-0000	B1-08	C	R	T	Yes	No	No				17		F	3
1820	20D-9-0000	B1-08	C	R	T	Yes	No	No	25.28	25.31	5.5	3	C	F	2
1822	20D-9-0000	B1-08	C	R	T	Yes	No	No	33.72	22.1	6.99	5	C	F	2
1823	20D-9-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
1824	20D-9-0000	B1-08	C	R	T	Yes	No	No				1		F	2
1840	20D-9-0000	B1-08	C	G	O	Yes	No	No				2		FF	2
1849	20D-9-0000	B1-08	C	R	T	Yes	No	No				4		FF	2
1851	20D-9-0000	B1-08	C	R	T	Yes	No	No				0.5		FF	1
1852	20D-9-0000	B1-08	C	R	T	Yes	No	No				1		FF	2
1853	20D-9-0000	B1-08	C	R	T	Yes	No	No				0.5		FF	1
1854	20D-9-0000	B1-08	C	R	T	Yes	No	No				1		FF	1
1856	20D-9-0000	B1-08	C	R	T	Yes	No	No				1		F	1

1857	20D-9-0000	B1-08	C	R	O	Yes	No	No				1		F	2
1858	20D-9-0000	B1-08	C	R	T	Yes	No	No				1		F	1
1859	20D-9-0000	B1-08	C	C	T	Yes	No	No				1		F	1
1864	20D-9-0000	B1-08	C	W	O	Yes	No	No				2		F	1
1865	20D-9-0000	B1-08	C	R	T	Yes	No	No				1		F	2
1866	20D-9-0000	B1-08	C	R	T	Yes	No	No				0.5		F	1
1867	20D-9-0000	B1-08	C	Z	O	Yes	No	No				0.5		FF	1
1868	20D-9-0000	B1-08	C	R	O	Yes	No	No				1		FF	1
1869	20D-9-0000	B1-08	C	D	T	Yes	No	No				0.5		F	1
1871	20D-9-0000	B1-08	C	R	O	Yes	No	No				2		FF	2
1872	20D-9-0000	B1-08	C	R	O	Yes	No	No				1		FF	2
1873	20D-9-0000	B1-08	C	R	O	Yes	No	No				4		FF	2
1877	20D-9-0000	B1-08	C	W	O	Yes	No	No				0.5		FF	1
1878	20D-9-0000	B1-08	C	C	T	Yes	No	No				2		FF	2
1879	20D-9-0000	B1-08	C	R	O	Yes	No	No				16	C	F	2
1882	20D-8-0000	B1-08	C	R	T	Yes	No	No				3		FF	2
1884	20D-8-0000	B1-08	C	W	O	Yes	No	No				7		F	2
1896	20D-8-0000	B1-08	C	X	T	Yes	No	No				6		F	2
1904	20D-8-0000	B1-08	C	R	O	Yes	No	No	16.76	17.57	6.33	1		F	2
1905	20D-8-0000	B1-08	C	R	O	Yes	No	No				2		FF	2
1909	20D-8-0000	B1-08	C	R	T	Yes	No	No				1		FF	1
1910	20D-8-0000	B1-08	C	R	T	Yes	No	No				1		F	2
1911	20D-8-0000	B1-08	C	R	O	Yes	No	No				0.5		FF	2
1914	20D-8-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
1915	20D-8-0000	B1-08	C	G	O	Yes	No	No				4		F	2
1917	20D-8-0000	B1-08	C	R	O	Yes	No	No				1		FF	1
1919	20D-8-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
1920	20D-8-0000	B1-08	C	R	T	Yes	No	No				1		FF	2
1935	20D-8-0000	B1-08	C	R	O	Yes	No	No	16.76	17.57	6.33	1		F	2
1936	20D-8-0000	B1-08	C	R	O	Yes	No	No				2		FF	2
1940	20D-8-0000	B1-08	C	R	T	Yes	No	No				1		F	2
1941	20D-8-0000	B1-08	C	R	T	Yes	No	No				1		F	2
1942	20D-8-0000	B1-08	C	R	O	Yes	No	No				0.5		FF	2
1945	20D-8-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
1946	20D-8-0000	B1-08	C	G	O	Yes	No	No				4		F	2
1948	20D-8-0000	B1-08	C	R	O	Yes	No	No				1		FF	1
1950	20D-8-0000	B1-08	C	R	T	Yes	No	No				2		FF	2
1951	20D-8-0000	B1-08	C	R	T	Yes	No	No				1		FF	2
1953	20D-8-0000	B1-08	C	G	O	Yes	No	No				2		FF	2
1966	15N-69-0000	B1-04	C	R	O	Yes	No	No				8		FF	3
1992	15N-69-0000	B1-04	C	R	O	Yes	No	No				33		FF	3
1993	15N-69-0000	B1-04	C	R	T	Yes	No	No				10		F	2
2051	20A-13-0000	B1-13	C	C	O	Yes	No	No				17		F	2
2052	20A-13-0000	B1-13	C	R	T	Yes	No	No				32		F	2
2053	20A-13-0000	B1-13	C	R	O	Yes	No	No				11		FF	2
2054	20A-13-0000	B1-13	C	G	O	Yes	No	No				5		FF	1
2055	20A-13-0000	B1-13	C	R	O	Yes	No	No				7		FF	1
2056	20A-13-0000	B1-13	C	R	T	Yes	No	No				9		FF	2
2057	20A-13-0000	B1-13	C	R	O	Yes	No	No				4		FF	1
2058	20A-13-0000	B1-13	C	R	T	Yes	No	No				5		FF	1
2060	20A-13-0000	B1-13	C	R	T	Yes	No	No				1		FF	1
2062	20A-13-0000	B1-13	C	R	T	Yes	No	No				4		FF	1
2063	20A-13-0000	B1-13	C	R	T	Yes	No	No				2		FF	1
2064	20A-13-0000	B1-13	C	R	T	Yes	No	No				4		FF	1

2065	20A-13-0000	B1-13	C	R	T	Yes	No	No					2		FF	1
2066	20A-13-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
2067	20A-13-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
2068	20A-13-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
2069	20A-13-0000	B1-13	C	R	T	Yes	No	No					4		FF	1
2070	20A-13-0000	B1-13	C	R	O	Yes	No	No					3		FF	1
2071	20A-13-0000	B1-13	C	R	T	Yes	No	No					1		FF	1
2072	20A-13-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
2073	20A-13-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
2074	20A-13-0000	B1-13	C	W	O	Yes	No	No					0.5		FF	1
2076	20A-13-0000	B1-13	C	R	T	Yes	No	No					2		F	1
2077	20A-13-0000	B1-13	C	Z	O	Yes	No	No					2		FF	1
2078	20A-13-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
2079	20A-13-0000	B1-13	C	R	T	Yes	No	No					8		FF	2
2080	20A-13-0000	B1-13	C	G	O	Yes	No	No					2		FF	1
2081	20A-13-0000	B1-13	C	G	O	Yes	No	No					0.5		FF	1
2082	20A-13-0000	B1-13	C	G	T	Yes	No	No					5		F	1
2083	20A-13-0000	B1-13	C	D	T	Yes	No	No					3		F	1
2084	20A-13-0000	B1-13	C	Z	O	Yes	No	No					0.5		FF	1
2085	20A-13-0000	B1-13	C	R	O	Yes	No	No					3		FF	1
2086	20A-13-0000	B1-13	C	W	O	Yes	No	No					2		FF	1
2089	20A-13-0000	B1-13	C	W	O	Yes	No	No					0.5		FF	1
2106	20A-13-0000	B1-13	C	C	T	Yes	No	No	33.51	26.89	15.06		7	S	FF	1
2113	20A-13-0000	B1-13	C	R	T	Yes	No	No					34		FF	4
2117	20A-13-0000	B1-13	C	R	T	Yes	No	No					3		FF	1
2118	20A-13-0000	B1-13	C	R	T	Yes	No	No					2		FF	1
2119	20A-13-0000	B1-13	C	R	O	Yes	No	No					2		FF	1
2120	20A-13-0000	B1-13	C	X	T	Yes	No	No					0.5		FF	1
2170	20D-22-1102	B1-08	C	R	T	Yes	No	No					0.5		FF	2
2174	20D-24-1154	B1-08	C	R	T	Yes	No	No	32.88	6.79	3.65		0.5	D	FF	2
2240	20C-28-1110	B1-08	C	G	T	Yes	No	No	34.74	10.71	7.42		2	D	FF	3
2292	20A-13-0000	B1-13	C	C	T	Yes	No	No					3		FF	1
2295	20A-13-0000	B1-13	C	C	T	Yes	No	No					2		FF	1
2298	20A-13-0000	B1-13	C	C	T	Yes	No	No					2		FF	1
2314	20A-13-0000	B1-13	C	R	T	Yes	No	No					9		F	2
2315	20A-13-0000	B1-13	C	G	T	Yes	No	No					5		F	1
2316	20A-13-0000	B1-13	C	R	T	Yes	No	No					11		F	2
2319	20A-13-0000	B1-13	C	C	T	Yes	No	No					4		FF	1
2320	20A-13-0000	B1-13	C	C	T	Yes	No	No	34.37	15.95	4.99		2	C	FF	1
2321	20A-13-0000	B1-13	C	R	O	Yes	No	No					2		FF	1
2322	20A-13-0000	B1-13	C	R	O	Yes	No	No					3		FF	1
2323	20A-13-0000	B1-13	C	R	O	Yes	No	No					4		FF	1
2324	20A-13-0000	B1-13	C	C	O	Yes	No	No					4		F	1
2325	20A-13-0000	B1-13	C	R	T	Yes	No	No	23.7	18.65	4.42		2	C	FF	1
2326	20A-13-0000	B1-13	C	R	T	Yes	No	No					5		F	1
2327	20A-13-0000	B1-13	C	G	O	Yes	No	No					3		FF	1
2328	20A-13-0000	B1-13	C	R	O	Yes	No	No					2		FF	1
2329	20A-13-0000	B1-13	C	R	O	Yes	No	No					9		FF	1
2330	20A-13-0000	B1-13	C	R	T	Yes	No	No					4		FF	1
2400	20C-28-1120	B1-08	C	G	O	Yes	No	No					0.5		FF	2
2413	20A-13-1068	B1-13	C	W	O	Yes	No	No					6		FF	3
2425	20D-19-1058	B1-08	C	R	T	Yes	No	No					5		FF	2
2426	20A-21-1056	B1-08	C	R	T	Yes	No	No					0.5		FF	2
2428	20A-21-1050	B1-08	C	X	O	Yes	No	No	60.34	42.51	27.36		50		B	4

2480	20j-20-0000	B1-13	C	G	O	Yes	No	No				2		FF	2
2485	20A-18-0000	B1-13	C	R	O	Yes	No	No				4		F	2
2486	20A-18-0000	B1-13	C	R	O	Yes	No	No				13		FF	3
2494	20A-18-0000	B1-13	C	R	T	Yes	No	No				4		FF	3
2502	20F-3-0000	B1-13	C	R	T	Yes	No	No				2		F	2
2503	20F-3-0000	B1-13	C	R	T	Yes	No	No				1		FF	2
2506	20F-3-0000	B1-13	C	R	O	Yes	No	No				6		F	2
2507	20F-3-0000	B1-13	C	C	T	Yes	No	No				2		FF	3
2522	20F-3-0000	B1-13	C	R	T	Yes	No	No				17		F	4
2546	20A-15-0000	B1-13	C	G	O	Yes	No	No				2		FF	2
2563	20A-15-0000	B1-13	C	R	O	Yes	No	No				4		FF	2
2564	20A-15-0000	B1-13	C	X	T	Yes	No	No				0.5		FF	2
2565	20A-15-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	1
2566	20A-15-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	1
2567	20A-15-0000	B1-13	C	R	T	Yes	No	No				2		FF	2
2568	20A-15-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	1
2569	20A-15-0000	B1-13	C	R	O	Yes	No	No				0.5		FF	1
2570	20A-15-0000	B1-13	C	R	O	Yes	No	No				7		F	2
2573	20A-15-0000	B1-13	C	R	T	Yes	No	No				11		F	2
2576	20A-15-0000	B1-13	C	R	T	Yes	No	No				13		F	3
2577	20A-15-0000	B1-13	C	R	O	Yes	No	No				2		FF	3
2579	20A-15-0000	B1-13	C	R	O	Yes	No	No				2		FF	2
2582	20A-15-0000	B1-13	C	R	T	Yes	No	No				4		F	2
2583	20A-15-0000	B1-13	C	R	T	Yes	No	No				9		F	3
2592	20A-15-0000	B1-13	C	D	T	Yes	No	No	56.05	44.47	22.1	53	S	FF	4
2599	20J-20-0000	B1-13	C	R	O	Yes	No	No				11	C	F	4
2601	20J-20-0000	B1-13	C	R	T	Yes	No	No				7		FF	3
2602	20J-20-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	1
2603	20J-20-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	1
2604	20J-20-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	1
2605	20J-20-0000	B1-13	C	C	T	Yes	No	No				2		FF	2
2637	20F-3-0000	B1-13	C	G	O	Yes	No	No				3		F	2
2643	20F-3-0000	B1-13	C	R	O	Yes	No	No				4		FF	2
2645	20F-3-0000	B1-13	C	R	T	Yes	No	No				4		FF	2
2686	20B-13-0000	B1-13	C	C	O	Yes	No	No				14		FF	3
2704	20A-15-0000	B1-13	C	R	O	Yes	No	No				7		FF	3
2705	20A-15-0000	B1-13	C	G	O	Yes	No	No				2		FF	2
2706	20A-15-0000	B1-13	C	R	O	Yes	No	No				6		FF	2
2707	20A-15-0000	B1-13	C	R	O	Yes	No	No				4		F	2
2708	20A-15-0000	B1-13	C	R	T	Yes	No	No				4		F	2
2710	20A-15-0000	B1-13	C	R	T	Yes	No	No				3		FF	2
2711	20A-15-0000	B1-13	C	R	T	Yes	No	No				1		FF	2
2712	20A-15-0000	B1-13	C	R	O	Yes	No	No				1		FF	2
2714	20A-15-0000	B1-13	C	R	O	Yes	No	No				1		FF	1
2715	20A-15-0000	B1-13	C	R	O	Yes	No	No				2		FF	2
2742	20B-13-0000	B1-13	C	R	T	Yes	No	No				2		F	2
2754	20B-13-0000	B1-13	C	W	T	Yes	No	No				20		FF	3
2765	20B-13-0000	B1-13	C	R	O	Yes	No	No				2		F	2
2785	20B-13-0000	B1-13	C	R	T	Yes	No	No				5		FB	3
2786	20B-13-0000	B1-13	C	R	T	Yes	No	No				8		F	3
2787	20B-13-0000	B1-13	C	R	T	Yes	No	No				25		F	4
2792	20B-13-0000	B1-13	C	R	T	Yes	No	No				8		FF	3
2793	20B-13-0000	B1-13	C	Z	T	Yes	No	No				12		F	4
2794	20B-13-0000	B1-13	C	R	T	Yes	No	No				8		FF	2

2795	20B-13-0000	B1-13	C	R	T	Yes	No	No					2		FF	2
2796	20B-13-0000	B1-13	C	R	T	Yes	No	No					3		F	3
2797	20B-13-0000	B1-13	C	R	T	Yes	No	No					3		FF	2
2799	20B-13-0000	B1-13	C	R	O	Yes	No	No					7		FF	2
2842	20B-13-0000	B1-13	C	D	T	Yes	No	No					3		FF	2
2850	20B-10-0000	B1-13	C	G	T	Yes	No	No					4		F	2
2857	20B-10-0000	B1-13	C	W	O	Yes	No	No					3		F	2
2858	20B-10-0000	B1-13	C	C	O	Yes	No	No					7		F	3
2859	20B-10-0000	B1-13	C	Z	O	Yes	No	No					3		F	2
2860	20B-10-0000	B1-13	C	W	O	Yes	No	No	33.03	19.53	7.07		5	C	FF	2
2861	20B-10-0000	B1-13	C	R	T	Yes	No	No					3		F	2
2862	20B-10-0000	B1-13	C	R	T	Yes	No	No					2		FF	2
2863	20B-10-0000	B1-13	C	R	T	Yes	No	No	30.86	18.45	6.07		4	C	FF	2
2864	20B-10-0000	B1-13	C	R	O	Yes	No	No					2		F	2
2866	20B-10-0000	B1-13	C	W	O	Yes	No	No					1		FF	2
2867	20B-10-0000	B1-13	C	W	O	Yes	No	No					5		FF	2
2868	20B-10-0000	B1-13	C	C	T	Yes	No	No	49.15	32.13	20.6		16	C	F	3
2869	20B-10-0000	B1-13	C	C	T	Yes	No	No					7		FF	3
2870	20B-10-0000	B1-13	C	C	O	Yes	No	No					6		FF	2
2876	20B-10-0000	B1-13	C	X	O	Yes	No	No					19		FF	3
2923	20A-18-0000	B1-13	C	R	T	Yes	No	No					12		FF	3
2924	20A-18-0000	B1-13	C	R	T	Yes	No	No					1		FF	2
2925	20A-18-0000	B1-13	C	R	T	Yes	No	No	28.54	29.6	7.41		6	C	FF	2
2927	20A-18-0000	B1-13	C	C	O	Yes	No	No					2		F	2
2930	20A-18-0000	B1-13	C	R	T	Yes	No	No					51		FF	3
2991	20A-18-0000	B1-13	C	W	O	Yes	No	No					24		F	3
2999	20A-15-0000	B1-13	C	R	T	Yes	No	No					34		F	4
3000	20A-15-0000	B1-13	C	R	T	Yes	No	No					20		FF	3
3001	20A-15-0000	B1-13	C	R	O	Yes	No	No					6		F	3
3003	20A-15-0000	B1-13	C	C	T	Yes	No	No					2		F	2
3005	20A-15-0000	B1-13	C	R	T	Yes	No	No					4		F	2
3006	20A-15-0000	B1-13	C	R	O	Yes	No	No					2		FF	2
3007	20A-15-0000	B1-13	C	R	T	Yes	No	No					1		FF	2
3008	20A-15-0000	B1-13	C	R	O	Yes	No	No					12		F	3
3009	20A-15-0000	B1-13	C	R	T	Yes	No	No					2		FF	2
3010	20A-15-0000	B1-13	C	R	O	Yes	No	No					0.5		FF	2
3011	20A-15-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
3012	20A-15-0000	B1-13	C	R	T	Yes	No	No					2		FF	2
3014	20A-15-0000	B1-13	C	R	T	Yes	No	No					0.5		FF	1
3016	20A-15-0000	B1-13	C	R	O	Yes	No	No					3		FF	2
3017	20A-15-0000	B1-13	C	R	T	Yes	No	No					2		FF	2
3018	20A-15-0000	B1-13	C	R	T	Yes	No	No					2		FF	1
3019	20A-15-0000	B1-13	C	R	O	Yes	No	No					2		FF	1
3043	20B-11-0000	B1-13	C	C	T	Yes	No	No					2		F	2
3061	20B-11-0000	B1-13	C	R	T	Yes	No	No					4		F	2
3062	20B-11-0000	B1-13	C	R	T	Yes	No	No					3		FF	2
3063	20B-11-0000	B1-13	C	R	T	Yes	No	No					2		F	2
3064	20B-11-0000	B1-13	C	R	T	Yes	No	No					3		FF	3
3067	20B-11-0000	B1-13	C	G	O	Yes	No	No					10		FF	2
3070	20B-11-0000	B1-13	C	W	O	Yes	No	No					3		FF	3
3074	20B-11-0000	B1-13	C	R	T	Yes	No	No					2		FF	2
3076	20B-11-0000	B1-13	C	C	T	Yes	No	No					6		F	3
3079	20B-11-0000	B1-13	C	R	O	Yes	No	No					5		F	2
3083	20B-11-0000	B1-13	C	R	T	Yes	No	No					4		FF	2

3084	20B-11-0000	B1-13	C	R	T	Yes	No	No				4		FF	2
3087	20B-11-0000	B1-13	C	R	T	Yes	No	No				3		FF	2
3088	20B-11-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3089	20B-11-0000	B1-13	C	R	O	Yes	No	No				0.5		FF	2
3093	20B-11-0000	B1-13	C	R	T	Yes	No	No				2		FF	2
3094	20B-11-0000	B1-13	C	R	O	Yes	No	No				3		F	2
3095	20B-11-0000	B1-13	C	R	T	Yes	No	No				2		FF	2
3097	20B-11-0000	B1-13	C	X	O	Yes	No	No				5		FF	2
3098	20B-11-0000	B1-13	C	R	O	Yes	No	No				2		FF	2
3103	20J-20-0000	B1-13	C	R	T	Yes	No	No				12		F	4
3104	20J-20-0000	B1-13	C	R	O	Yes	No	No				8		FF	3
3105	20J-20-0000	B1-13	C	R	O	Yes	No	No				4		F	2
3106	20J-20-0000	B1-13	C	R	T	Yes	No	No				12		F	4
3107	20J-20-0000	B1-13	C	R	T	Yes	No	No				7		F	3
3108	20J-20-0000	B1-13	C	R	T	Yes	No	No				5		F	3
3109	20J-20-0000	B1-13	C	C	T	Yes	No	No				7		FF	3
3110	20J-20-0000	B1-13	C	R	T	Yes	No	No				5		F	2
3111	20J-20-0000	B1-13	C	R	O	Yes	No	No				2		FF	4
3112	20J-20-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3113	20J-20-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3115	20J-20-0000	B1-13	C	R	T	Yes	No	No				0.5		F	1
3116	20J-20-0000	B1-13	C	R	T	Yes	No	No				3		FF	2
3117	20J-20-0000	B1-13	C	G	O	Yes	No	No				16		FF	4
3143	20A-15-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3165	20B-11-996	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3166	20B-11-996	B1-13	C	R	T	Yes	No	No				2		FF	3
3224	20A-13-906	B1-13	C	R	T	Yes	No	No				2		FF	2
3225	20A-13-906	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3238	20A-13-904	B1-13	C	R	T	Yes	No	No				2		FF	2
3246	20A-17-992	B1-05	C	R	O	Yes	No	No				0.5		FF	2
3283	20F-3-0000	B1-13	C	R	T	Yes	No	No	31.2	17.29	6.96	2	C	FF	2
3286	20F-3-0000	B1-13	C	W	O	Yes	No	No				5		FF	2
3287	20F-3-0000	B1-13	C	G	O	Yes	No	No				5		FF	2
3288	20F-3-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3310	20A-13-0000	B1-13	C	R	T	Yes	No	No				0.5		FF	2
3329	15N-138-0000	B1-05	C	C	T	Yes	No	No				2		F	2
3339	15N-126-0000	B1-05	C	R	T	Yes	No	No	20.36	3.7	4.77	0.5	D	FF	1
3341	15N-138-0000	B1-05	C	G	O	Yes	No	No				46		F	4
3342	15N-138-0000	B1-05	C	R	T	Yes	No	No				27		F	3
3343	15N-138-0000	B1-05	C	R	T	Yes	No	No				49		FF	3
3344	15N-138-0000	B1-05	C	R	T	Yes	No	No				4		FF	2
3345	15N-138-0000	B1-05	C	R	T	Yes	No	No				22		FF	4
3347	15N-138-0000	B1-05	C	R	T	Yes	No	No				0.5		F	1
3348	15N-138-0000	B1-05	C	Z	O	Yes	No	No				10		FF	3
3350	15N-138-0000	B1-05	C	R	T	Yes	No	No				0.5		FF	2
3353	15N-138-0000	B1-05	C	C	O	Yes	No	No				20		F	3
3354	15N-138-0000	B1-05	C	W	O	Yes	No	No				6		F	2
3355	15N-138-0000	B1-05	C	W	O	Yes	No	No				3		FF	2
3356	15N-138-0000	B1-05	C	Z	O	Yes	No	No				23		FF	3
3384	15N-141-0000	B1-05	C	W	T	Yes	No	No	29.55	21.91	22.02	5	C	F	2
3385	15N-141-0000	B1-05	C	R	T	Yes	No	No				2		FF	2
3391	15N-141-0000	B1-05	C	Z	O	Yes	No	No				12		F	3
3403	15N-126-0000	B1-05	C	G	O	Yes	No	No				2		FF	2
3425	15N-122-0000	B1-04	C	R	O	Yes	No	No				3		FF	2

3427	15N-122-0000	B1-04	C	G	O	Yes	No	No					3		FF	2
3429	15N-122-0000	B1-04	C	R	O	Yes	No	No	68.23	38.5	18.83		45	C	F	4
3430	15N-122-0000	B1-04	C	R	O	Yes	No	No					33		FF	4
3444	15N-137-0000	B1-05	C	W	T	Yes	No	No					47		F	4
3445	15N-137-0000	B1-05	C	R	T	Yes	No	No					10		FF	3
3448	15N-137-0000	B1-05	C	C	T	Yes	No	No					16		F	3
3450	15N-137-0000	B1-05	C	R	O	Yes	No	No					6		FF	2
3451	15N-137-0000	B1-05	C	W	O	Yes	No	No					2		FF	2
3452	15N-137-0000	B1-05	C	R	O	Yes	No	No					3		FF	2
20	15N-21-0000	B1-03-A	C	C	T	No	Yes	No					62		F	4
36	15N-21-0000	B1-03-A	C	C	T	No	Yes	No	58.07	36.18	10.22		22	C	F	4
37	15N-21-0000	B1-03-A	C	C	T	No	Yes	No					55		K	3
43	15N-23-0000	B1-02	C	X	O	No	Yes	No					16		FB	4
47	19D-9-0000	B1-02	C	D	T	No	Yes	No					43		FF	3
143	19D-9-0000	B1-02	C	C	T	No	Yes	No					5		FF	2
184	19D-18-0000	B1-08	C	X	O	No	Yes	No					27		K	3
79	19D-9-0000	B1-02	C	R	T	Yes	Yes	No					5		K	2
191	19D-18-0000	B1-08	C	R	T	Yes	Yes	No	54.14	36.47	10.71		22	S	F	4
332	20I-6-0000	B1-12	C	X	T	No	Yes	No					8		F	3
562	19D-17-0000	B1-06	C	C	T	No	Yes	No					39		F	3
565	19D-17-0000	B1-06	C	C	T	No	Yes	No					0.5		FF	2
607	20I-11-0000	B1-12	C	C	T	No	Yes	No					5		FF	2
610	20I-11-0000	B1-12	C	C	T	No	Yes	No					5		F	2
646	19D-15-0000	B1-06	C	C	T	No	Yes	No					22		F	4
656	19D-15-0000	B1-06	C	C	T	No	Yes	No					3		F	3
657	19D-15-0000	B1-06	C	C	T	No	Yes	No					0.5		FF	2
659	19D-15-0000	B1-06	C	C	T	No	Yes	No					7		F	3
683	19D-15-0000	B1-06	C	X	O	No	Yes	No	27.02	10.87	4.71		1	B	F	2
735	20C-19-0000	B1-07	C	C	T	No	Yes	No	22.29	16.14	7.5		3	R	F	3
736	20C-19-0000	B1-07	C	X	T	No	Yes	No					5		F	3
749	20C-19-0000	B1-07	C	D	O	No	Yes	No					3		FF	1
766	20C-19-0000	B1-07	C	G	O	No	Yes	No					2		FF	2
780	20C-19-0000	B1-07	C	C	T	No	Yes	No					4		F	2
784	20C-19-0000	B1-07	C	C	O	No	Yes	No					5		F	2
792	15N-69-0000	B1-04	C	X	O	No	Yes	No					66		K	4
794	15N-69-0000	B1-04	C	X	O	No	Yes	No					40		F	3
796	15N-69-0000	B1-04	C	X	O	No	Yes	No					20		F	4
797	15N-69-0000	B1-04	C	X	O	No	Yes	No					13		FF	3
798	15N-69-0000	B1-04	C	X	O	No	Yes	No					6		F	3
800	15N-69-0000	B1-04	C	X	O	No	Yes	No					5		F	3
849	15N-59-0000	B1-04	C	D	T	No	Yes	No	44.85	32.97	11.29		16	C	FF	3
851	15N-59-0000	B1-04	C	W	O	No	Yes	No					10		F	4
852	15N-59-0000	B1-04	C	W	O	No	Yes	No					10		F	3
853	15N-59-0000	B1-04	C	Z	O	No	Yes	No					8		FF	3
856	15N-59-0000	B1-04	C	C	T	No	Yes	No					137		C	4
914	15N-42-0000	B1-03-G	C	C	T	No	Yes	No					157		C	4
915	15N-42-0000	B1-03-G	C	C	T	No	Yes	No					19		K	3
916	15N-42-0000	B1-03-G	C	C	T	No	Yes	No	28.79	26.64	9.99		6	C	F	3
920	15N-42-0000	B1-03-G	C	X	O	No	Yes	No					7		F	3
921	15N-42-0000	B1-03-G	C	C	T	No	Yes	No					4		F	2
935	15N-69-0000	B1-04	C	X	T	No	Yes	No	40.89	17.01	6.86		5	D	FF	3
936	15N-69-0000	B1-04	C	X	O	No	Yes	No	35.21	35.23	13.26		16	C	F	3
942	15N-69-0000	B1-04	C	X	O	No	Yes	No	24.23	21.61	5.09		3	C	F	2
943	15N-69-0000	B1-04	C	X	O	No	Yes	No	46.03	23.51	9.92		10	C	F	4

1055	15N-44-0000	B1-03-H	C	C	T	No	Yes	No	36.42	34.05	17.19	27	S	K	3
1057	15N-44-0000	B1-03-H	C	X	O	No	Yes	No				145		F	4
1060	15N-44-0000	B1-03-H	C	X	O	No	Yes	No				76		K	4
1062	15N-44-0000	B1-03-H	C	X	O	No	Yes	No				8		FF	3
1065	15N-44-0000	B1-03-H	C	X	T	No	Yes	No				31		FF	4
1068	15N-44-0000	B1-03-H	C	X	T	No	Yes	No				17		F	3
1147	15N-25-0000	B1-03-E	C	C	T	No	Yes	No				11		F	3
1149	15N-25-0000	B1-03-E	C	C	T	No	Yes	No				39		K	4
1154	15N-69-0000	B1-04	C	C	T	No	Yes	No				27		F	4
1157	15N-69-0000	B1-04	C	C	T	No	Yes	No				14		FF	4
1172	15N-44-0000	B1-03-H	C	C	T	No	Yes	No				11		F	3
1181	15N-44-0000	B1-03-H	C	C	T	No	Yes	No				2		F	2
1185	15N-44-0000	B1-03-H	C	C	T	No	Yes	No				22		K	4
1316	15N-69-0000	B1-04	C	C	T	No	Yes	No				4	C	F	2
1317	15N-69-0000	B1-04	C	X	O	No	Yes	No				18		F	3
1320	15N-69-0000	B1-04	C	C	T	No	Yes	No				16		FF	3
1325	15N-69-0000	B1-04	C	C	T	No	Yes	No				22		FF	3
1327	15N-42-0000	B1-03-G	C	C	T	No	Yes	No				57		F	4
1333	20C-19-0000	B1-07	C	C	T	No	Yes	No				2		FF	1
1334	20C-19-0000	B1-07	C	X	O	No	Yes	No				4		F	2
1374	20C-3-0000	B1-05	C	X	T	No	Yes	No				9	C	F	3
1426	20A-3 C1:2000	B1-04	C	D	O	No	Yes	No				2		FF	1
1437	20A-8 C1:2000	B1-04	C	G	O	No	Yes	No				13		F	2
1439	20A-8 C1:2000	B1-04	C	C	T	No	Yes	No				21		FF	2
1454	20C-3-0000	B1-05	C	D	T	No	Yes	No				73		K	4
1457	20C-3-0000	B1-05	C	D	O	No	Yes	No				24		F	3
1458	20C-3-0000	B1-05	C	D	T	No	Yes	No				18	C	F	4
1465	20C-3-0000	B1-05	C	D	T	No	Yes	No				6	C	F	3
1469	20C-3-0000	B1-05	C	C	T	No	Yes	No				33	S	F	4
1470	20C-3-0000	B1-05	C	C	T	No	Yes	No				8		F	3
1480	20C-3-0000	B1-05	C	C	T	No	Yes	No				11	C	FB	4
1481	20C-3-0000	B1-05	C	X	T	No	Yes	No				6	S	F	2
1485	20C-3-0000	B1-05	C	W	O	No	Yes	No				22		F	4
1557	20B-1-0000	B1-05	C	C	T	No	Yes	No				92	S	F	4
1569	20B-1-0000	B1-05	C	C	T	No	Yes	No				23	C	F	3
1573	20B-1-0000	B1-05	C	D	O	No	Yes	No				11		F	2
1657	19D-9-1424	B1-02	C	C	O	No	Yes	No	91.59	64.93	32.08	234		F	4
1680	20C-1-0000	B1-05	C	C	T	No	Yes	No				24		K	3
1688	20C-1-0000	B1-05	C	D	O	No	Yes	No				3		FB	2
1689	20C-1-0000	B1-05	C	C	T	No	Yes	No	25.59	19.69	3.39	2	C	FF	2
1701	20C-5-0000	B1-05	C	W	O	No	Yes	No				25		F	3
1703	20C-5-0000	B1-05	C	C	T	No	Yes	No				9		F	2
1713	20C-5-0000	B1-05	C	C	C	No	Yes	No				4		F	2
1727	20A-6-0000	B1-04	C	X	O	No	Yes	No				16		F	4
1732	20A-6-0000	B1-04	C	C	T	No	Yes	No				3		FF	2
1752	20A-6-0000	B1-04	C	C	T	No	Yes	No				0.5		FF	2
1758	20A-6-0000	B1-04	C	Z	O	No	Yes	No	22.8	19.28	5.67	0.5		F	2
1759	20A-6-0000	B1-04	C	Z	O	No	Yes	No	16	10.89	4.01	0.5	C	F	1
1764	20A-6-0000	B1-04	C	G	O	No	Yes	No	31.07	24.16	6.07	0.5	C	F	2
1766	20A-6-0000	B1-04	C	X	O	No	Yes	No				0.5		FF	1
1837	20D-9-0000	B1-08	C	C	T	No	Yes	No				0.5		FF	2
1838	20D-9-0000	B1-08	C	C	T	No	Yes	No				2		F	2
1839	20D-9-0000	B1-08	C	X	O	No	Yes	No	19.39	15.55	11.01	3	S	F	2
1899	20D-8-0000	B1-08	C	C	T	No	Yes	No				7		F	2

1900	20D-8-0000	B1-08	C	C	T	No	Yes	No	29.94	23.11	4.64	4	C	F	2
1982	15N-69-0000	B1-04	C	G	O	No	Yes	No	27.42	23.04	3.36	2		F	2
2393	20F-1-1213	B1-13	C	C	T	No	Yes	No				0.5		FF	2
2394	20F-1-1213	B1-13	C	C	T	No	Yes	No	28.71	3.69	3.13	0.5	D	FF	2
2396	20F-1-1213	B1-13	C	C	T	No	Yes	No	24.47	7.4	4.56	0.5	D	FF	2
2405	20D-23-1236	B1-08	C	Z	O	No	Yes	No	27.28	5	5.68	0.5	D	FF	2
2435	20E-6-1232	B1-10	C	G	T	No	Yes	No				0.5		FF	2
2635	20F-3-0000	B1-13	C	W	O	No	Yes	No				5		FF	2
2638	20F-3-0000	B1-13	C	G	T	No	Yes	No				13		F	3
2964	20A-15-0000	B1-13	C	C	T	No	Yes	No				13		F	2
2965	20A-15-0000	B1-13	C	C	T	No	Yes	No				13		F	3
2980	20A-15-0000	B1-13	C	C	T	No	Yes	No				1		FF	2
3292	20F-3-0000	B1-13	C	C	T	No	Yes	No				6		F	3
3317	15N-138-0000	B1-05	C	C	T	No	Yes	No				2		F	2
3321	15N-138-0000	B1-05	C	C	T	No	Yes	No				13		FF	2
3357	15N-138-0000	B1-05	C	C	T	No	Yes	No				13		F	4
3359	15N-138-0000	B1-05	C	C	T	No	Yes	No				7		F	4
3365	15N-138-0000	B1-05	C	C	T	No	Yes	No				11		FF	3
3368	15N-138-0000	B1-05	C	C	T	No	Yes	No				3		FF	2
3371	15N-122-0000	B1-04	C	X	T	No	Yes	No				7		FF	2
3372	15N-122-0000	B1-04	C	C	T	No	Yes	No				0.5		FF	3
3406	15N-143-0000	B1-05	C	C	T	No	Yes	No				17		F	3
3410	15N-122-0000	B1-04	C	C	T	No	Yes	No				99		K	4
3413	15N-122-0000	B1-04	C	C	T	No	Yes	No				5		FF	2
3415	15N-122-0000	B1-04	C	C	T	No	Yes	No				2		FF	3
3419	15N-122-0000	B1-04	C	X	T	No	Yes	No	33.14	14.03	7.21	3	C	FF	3
3420	15N-122-0000	B1-04	C	C	T	No	Yes	No				2		FF	3
3421	15N-122-0000	B1-04	C	C	T	No	Yes	No				2		FF	2
3422	15N-122-0000	B1-04	C	C	T	No	Yes	No				0.5	C	FF	2
3436	15N-137-0000	B1-05	C	C	T	No	Yes	No				14		F	3
3442	15N-137-0000	B1-05	C	C	T	No	Yes	No	31.96	10.74	4.83	2	C	F	2
3453	15N-137-0000	B1-05	C	C	T	No	Yes	No				9		F	3
3457	15N-124-0000	B1-04	C	C	O	No	Yes	No				15		FF	4
34	19D-6-0000	B1-02	C	C	T	Yes	Yes	No				40		F	4
379	20I-11-0000	B1-12	C	G	T	Yes	Yes	No				2		FF	3
428	20I-11-0000	B1-12	C	R	T	Yes	Yes	No				3		F	2
586	19D-20-0000	B1-08	C	R	T	Yes	Yes	No				9		F	3
590	19D-20-0000	B1-08	C	G	T	Yes	Yes	No				0.5		FF	2
707	20C-19-0000	B1-07	C	D	T	Yes	Yes	No				5		F	2
718	20C-19-0000	B1-07	C	R	T	Yes	Yes	No				0.5		FF	1
744	20C-19-0000	B1-07	C	C	T	Yes	Yes	No				0.5		FF	1
818	15N-69-0000	B1-04	C	R	O	Yes	Yes	No				46		K	4
824	15N-69-0000	B1-04	C	R	T	Yes	Yes	No				13		FF	3
834	15N-69-0000	B1-04	C	R	O	Yes	Yes	No				5		FF	2
835	15N-69-0000	B1-04	C	Z	O	Yes	Yes	No				11		FF	3
868	15N-59-0000	B1-04	C	R	O	Yes	Yes	No				67		F	4
875	15N-59-0000	B1-04	C	C	T	Yes	Yes	No				6		F	2
876	15N-59-0000	B1-04	C	D	O	Yes	Yes	No				7		FF	2
878	15N-59-0000	B1-04	C	G	O	Yes	Yes	No				4		FF	2
928	15N-42-0000	B1-03-G	C	R	O	Yes	Yes	No				5		FF	2
1052	15N-44-0000	B1-03-H	C	D	T	Yes	Yes	No				2		K	2
1143	15N-25-0000	B1-03-E	C	C	T	Yes	Yes	No	42.79	32.55	11.44	13	C	F	3
1190	15N-44-0000	B1-03-H	C	Z	O	Yes	Yes	No				20		F	4
1198	15N-44-0000	B1-03-H	C	C	T	Yes	Yes	No				101		K	4

1200	15N-44-0000	B1-03-H	C	R	T	Yes	Yes	No				9	FF	3	
1203	15N-44-0000	B1-03-H	C	W	O	Yes	Yes	No	28.75	16.8	7.52	4	C	F	2
1204	15N-44-0000	B1-03-H	C	W	O	Yes	Yes	No				23		FF	4
1208	15N-44-0000	B1-03-H	C	X	O	Yes	Yes	No				13		FF	3
1298	20C-19-0000	B1-07	C	R	O	Yes	Yes	No				0.5		FF	1
1304	20C-19-0000	B1-07	C	C	T	Yes	Yes	No				0.5		FF	1
1353	20C-19-0000	B1-07	C	R	O	Yes	Yes	No				3		FF	2
1363	20C-19-0000	B1-07	C	R	O	Yes	Yes	No				0.5		FF	1
1365	20C-19-0000	B1-07	C	R	O	Yes	Yes	No				0.5		FF	1
1377	20C-3-0000	B1-05	C	C	T	Yes	Yes	No				6		F	2
1381	20C-3-0000	B1-05	C	X	T	Yes	Yes	No				2		FF	2
1436	20A-8 C1:2000	B1-04	C	R	T	Yes	Yes	No				14	S	F	2
1449	20A-8 C1:2000	B1-04	C	Z	O	Yes	Yes	No				3		F	2
1459	20C-3-0000	B1-05	C	C	T	Yes	Yes	No				9		F	3
1489	20C-3-0000	B1-05	C	R	T	Yes	Yes	No				15		F	3
1570	20B-1-0000	B1-05	C	X	T	Yes	Yes	No				10		F	2
1667	20C-1-0000	B1-05	C	D	O	Yes	Yes	No				9		FF	4
1670	20C-1-0000	B1-05	C	D	O	Yes	Yes	No				2		F	2
1671	20C-1-0000	B1-05	C	G	O	Yes	Yes	No				9		F	3
1682	20C-1-0000	B1-05	C	D	O	Yes	Yes	No				32		FF	3
1684	20C-1-0000	B1-05	C	C	O	Yes	Yes	No				8		F	3
1695	20C-5-0000	B1-05	C	W	O	Yes	Yes	No	34.27	28.11	12.2	11		FF	2
1696	20C-5-0000	B1-05	C	W	O	Yes	Yes	No				1		FF	2
1719	20C-5-0000	B1-05	C	R	T	Yes	Yes	No				3		FF	2
1720	20C-5-0000	B1-05	C	R	T	Yes	Yes	No				2		FF	2
1769	20A-6-0000	B1-04	C	C	T	Yes	Yes	No	51.7	21.16	12.22	11	C	F	4
1771	20A-6-0000	B1-04	C	G	O	Yes	Yes	No				9		F	4
1773	20A-6-0000	B1-04	C	R	T	Yes	Yes	No	25.78	20.4	4.67	2	C	F	2
1776	20A-6-0000	B1-04	C	R	T	Yes	Yes	No				2		F	2
1777	20A-6-0000	B1-04	C	W	T	Yes	Yes	No				6		FF	2
1799	20D-9-0000	B1-08	C	R	T	Yes	Yes	No				11		F	4
1805	20D-9-0000	B1-08	C	R	T	Yes	Yes	No				31		FF	3
1806	20D-9-0000	B1-08	C	C	T	Yes	Yes	No				25		F	3
1842	20D-9-0000	B1-08	C	W	O	Yes	Yes	No				2		FF	2
1848	20D-9-0000	B1-08	C	W	O	Yes	Yes	No				3		F	2
1855	20D-9-0000	B1-08	C	R	T	Yes	Yes	No				1		FF	2
1861	20D-9-0000	B1-08	C	R	C	Yes	Yes	No				2		F	2
1863	20D-9-0000	B1-08	C	R	T	Yes	Yes	No				2	C	F	1
1870	20D-9-0000	B1-08	C	R	T	Yes	Yes	No				1		FF	1
1891	20D-8-0000	B1-08	C	W	O	Yes	Yes	No				3		F	2
1907	20D-8-0000	B1-08	C	R	T	Yes	Yes	No				2		F	1
1908	20D-8-0000	B1-08	C	D	T	Yes	Yes	No				2		FF	2
1913	20D-8-0000	B1-08	C	R	O	Yes	Yes	No				1		FF	1
1938	20D-8-0000	B1-08	C	R	T	Yes	Yes	No				2		F	1
1939	20D-8-0000	B1-08	C	D	T	Yes	Yes	No				2		FF	2
1944	20D-8-0000	B1-08	C	R	O	Yes	Yes	No				1		FF	1
1995	15N-69-0000	B1-04	C	W	O	Yes	Yes	No				4		F	3
2121	20A-13-0000	B1-13	C	R	T	Yes	Yes	No				2		FF	2
2347	20A-13-0000	B1-13	C	R	T	Yes	Yes	No				1		FF	1
2504	20F-3-0000	B1-13	C	R	T	Yes	Yes	No				2		FF	2
2562	20A-15-0000	B1-13	C	R	T	Yes	Yes	No				3		FF	3
2572	20A-15-0000	B1-13	C	R	O	Yes	Yes	No				0.5		FF	2
2982	20A-15-0000	B1-13	C	C	T	Yes	Yes	No				1		FF	2
3004	20A-15-0000	B1-13	C	R	T	Yes	Yes	No	50.16	21.39	7.59	7	C	FB	4

3072	20B-11-0000	B1-13	C	R	O	Yes	Yes	No				6		F	2
3085	20B-11-0000	B1-13	C	R	T	Yes	Yes	No				4		FF	2
3090	20B-11-0000	B1-13	C	R	T	Yes	Yes	No				9		FF	2
3291	20F-3-0000	B1-13	C	C	T	Yes	Yes	No				19		FF	3
3330	15N-138-0000	B1-05	C	R	T	Yes	Yes	No				0.5		FF	1
3346	15N-138-0000	B1-05	C	C	T	Yes	Yes	No				6		FF	2
3351	15N-138-0000	B1-05	C	R	T	Yes	Yes	No				3		FF	2
3408	15N-143-0000	B1-05	C	R	T	Yes	Yes	No				7		F	3
3426	15N-122-0000	B1-04	C	R	O	Yes	Yes	No				12		F	3
3431	15N-122-0000	B1-04	C	Z	O	Yes	Yes	No				26		FF	4
2	19D-6-0000	B1-02	C	X	O	No	No	Yes				4		F	2
16	19D-6-0000	B1-02	C	X	O	No	No	Yes				3		FF	2
40	15N-22-0000	B1-03-C	C	R	O	No	No	Yes				7		FF	2
41	15N-22-0000	B1-03-C	C	C	T	No	No	Yes				21		FF	3
48	19D-9-0000	B1-02	C	D	T	No	No	Yes	53.73	44.86	18.59	43	S	F	4
49	19D-9-0000	B1-02	C	X	T	No	No	Yes				27		F	4
58	19D-9-0000	B1-02	C	X	O	No	No	Yes				248		C	4
59	19D-9-0000	B1-02	C	X	T	No	No	Yes	88.84	44.36	43.2	260	BA	HS	4
87	19D-9-0000	B1-02	C	C	O	No	No	Yes				60		F	4
89	19D-9-0000	B1-02	C	C	T	No	No	Yes				5		F	2
91	19D-9-0000	B1-02	C	C	T	No	No	Yes				20		F	4
98	19D-9-0000	B1-02	C	C	T	No	No	Yes				6		FF	3
99	19D-9-0000	B1-02	C	C	T	No	No	Yes				12		FF	4
101	19D-9-0000	B1-02	C	C	T	No	No	Yes				2		FF	2
104	19D-9-0000	B1-02	C	C	T	No	No	Yes				5		FF	2
110	19D-9-0000	B1-02	C	C	T	No	No	Yes				6		FF	2
114	19D-9-0000	B1-02	C	C	O	No	No	Yes				4		F	2
116	19D-9-0000	B1-02	C	C	O	No	No	Yes				2		FF	2
121	19D-9-0000	B1-02	C	D	T	No	No	Yes	114.82	63.81	47.9	412	BA	H	4
140	19D-9-0000	B1-02	C	X	O	No	No	Yes				16		FF	4
149	19D-9-0000	B1-02	C	C	O	No	No	Yes				1		FF	2
151	19D-9-0000	B1-02	C	C	T	No	No	Yes				2		F	2
158	19D-9-0000	B1-02	C	D	O	No	No	Yes				11		F	2
161	19D-9-0000	B1-02	C	C	O	No	No	Yes				2		FF	2
209	19D-18-0000	B1-08	C	D	T	No	No	Yes				1		FF	2
214	19D-18-0000	B1-08	C	C	T	No	No	Yes				14		FB	4
218	19D-18-0000	B1-08	C	D	T	No	No	Yes				5		F	3
223	19D-18-0000	B1-08	C	C	T	No	No	Yes	40.44	30.78	9.9	10	C	F	3
234	20I-10-0000	B1-12	C	C	O	No	No	Yes				4		FF	2
237	20I-10-0000	B1-12	C	X	O	No	No	Yes				23		FF	3
238	20I-10-0000	B1-12	C	D	O	No	No	Yes				19		K	3
240	20I-10-0000	B1-12	C	C	T	No	No	Yes				3		FF	2
241	20I-10-0000	B1-12	C	C	O	No	No	Yes				2		FF	2
247	20I-9-0000	B1-12	C	C	O	No	No	Yes				38		C	4
264	20I-9-0000	B1-12	C	C	T	No	No	Yes				7		F	3
265	20I-9-0000	B1-12	C	C	T	No	No	Yes				5		F	2
285	20I-7-0000	B1-12	C	C	T	No	No	Yes				29		FF	4
287	20I-7-0000	B1-12	C	C	T	No	No	Yes				78	S	F	4
290	20I-7-0000	B1-12	C	C	T	No	No	Yes				5		FF	2
292	20I-7-0000	B1-12	C	D	T	No	No	Yes	80.06	55.53	19.53	51	S	F	4
294	20I-7-0000	B1-12	C	D	T	No	No	Yes				13		F	3
305	20I-4-0000	B1-12	C	C	T	No	No	Yes				8		F	3
311	20I-4-0000	B1-12	C	C	T	No	No	Yes				2		F	2
319	20I-6-0000	B1-12	C	C	T	No	No	Yes				34		F	4

321	20I-6-0000	B1-12	C	W	O	No	No	Yes				17		F	3
39	15N-22-0000	B1-03-C	C	R	T	Yes	No	Yes				16		FF	2
61	19D-9-0000	B1-02	C	R	T	Yes	No	Yes				11		F	2
63	19D-9-0000	B1-02	C	R	T	Yes	No	Yes				10		F	2
64	19D-9-0000	B1-02	C	R	T	Yes	No	Yes				35		F	4
65	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				9		FF	3
66	19D-9-0000	B1-02	C	R	T	Yes	No	Yes				6		F	2
69	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				13		FF	3
70	19D-9-0000	B1-02	C	G	O	Yes	No	Yes				32		FF	4
71	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				9		F	2
76	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				38		FF	4
77	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				9		F	3
78	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				2		FF	2
81	19D-9-0000	B1-02	C	Z	O	Yes	No	Yes				4		F	2
84	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				3		FF	2
111	19D-9-0000	B1-02	C	C	T	Yes	No	Yes				4		FF	2
117	19D-9-0000	B1-02	C	C	O	Yes	No	Yes				0.5		FF	1
122	19D-9-0000	B1-02	C	G	O	Yes	No	Yes				9		FF	2
132	19D-9-0000	B1-02	C	C	T	Yes	No	Yes				3		FF	2
135	19D-9-0000	B1-02	C	R	O	Yes	No	Yes				7		FF	2
136	19D-9-0000	B1-02	C	G	O	Yes	No	Yes				3		FF	2
137	19D-9-0000	B1-02	C	G	O	Yes	No	Yes				0.5		FF	2
162	19D-9-0000	B1-02	C	G	O	Yes	No	Yes				0.5		FF	2
172	19D-6-0000	B1-02	C	R	T	Yes	No	Yes				20		FF	4
173	19D-6-0000	B1-02	C	R	T	Yes	No	Yes				18		F	4
174	19D-6-0000	B1-02	C	R	O	Yes	No	Yes				19		K	2
192	19D-18-0000	B1-08	C	R	T	Yes	No	Yes				36		FF	4
193	19D-18-0000	B1-08	C	R	T	Yes	No	Yes				10		F	3
195	19D-18-0000	B1-08	C	R	T	Yes	No	Yes				8		F	3
197	19D-18-0000	B1-08	C	R	O	Yes	No	Yes				45		F	4
198	19D-18-0000	B1-08	C	R	T	Yes	No	Yes				9		F	3
204	19D-18-0000	B1-08	C	R	T	Yes	No	Yes				3		FF	2
206	19D-18-0000	B1-08	C	W	O	Yes	No	Yes				4		FF	2
208	19D-18-0000	B1-08	C	R	T	Yes	No	Yes				2		FF	2
248	20I-9-0000	B1-12	C	R	T	Yes	No	Yes				30		F	4
252	20I-9-0000	B1-12	C	R	T	Yes	No	Yes				3		FF	2
255	20I-9-0000	B1-12	C	R	T	Yes	No	Yes				7		F	2
256	20I-9-0000	B1-12	C	C	O	Yes	No	Yes				0.5		F	2
257	20I-9-0000	B1-12	C	R	T	Yes	No	Yes				4		FF	2
295	20I-7-0000	B1-12	C	R	O	Yes	No	Yes				23		FF	2
297	20I-4-0000	B1-12	C	C	T	Yes	No	Yes				13		F	3
300	20I-4-0000	B1-12	C	R	T	Yes	No	Yes				7		F	3
301	20I-4-0000	B1-12	C	C	O	Yes	No	Yes				27		F	3
322	20I-6-0000	B1-12	C	W	O	No	No	Yes				5		F	3
329	20I-6-0000	B1-12	C	X	O	No	No	Yes				13		F	3
341	20I-6-0000	B1-12	C	C	T	No	No	Yes				13		FF	4
344	20I-6-0000	B1-12	C	C	O	No	No	Yes				11		FF	3
347	20I-6-0000	B1-12	C	C	O	No	No	Yes	24.55	20.73	8.08	3	C	F	2
396	20I-11-0000	B1-12	C	D	T	No	No	Yes				21		F	3
397	20I-11-0000	B1-12	C	D	T	No	No	Yes				7		F	3
399	20I-11-0000	B1-12	C	C	O	No	No	Yes				59		F	4
401	20I-11-0000	B1-12	C	C	T	No	No	Yes				2		FF	2
402	20I-11-0000	B1-12	C	C	O	No	No	Yes				9		F	3
403	20I-11-0000	B1-12	C	C	T	No	No	Yes				3		F	2

406	20I-11-0000	B1-12	C	C	T	No	No	Yes					1		FF	2
408	20I-11-0000	B1-12	C	C	O	No	No	Yes					2		F	1
410	20I-11-0000	B1-12	Q	Z	T	No	No	Yes					11		HF	2
411	20I-11-0000	B1-12	Q	Z	T	No	No	Yes					3		HF	2
413	20I-11-0000	B1-12	Z	R	O	No	No	Yes					9		F	3
419	20I-11-0000	B1-12	C	W	O	No	No	Yes					3		FF	2
436	20I-11-0000	B1-12	C	C	T	No	No	Yes					19		F	3
454	20I-11-0000	B1-12	C	G	O	No	No	Yes					8		F	3
456	20I-11-0000	B1-12	C	X	O	No	No	Yes					20		FF	3
458	20I-11-0000	B1-12	C	X	O	No	No	Yes					14		FF	3
459	20I-11-0000	B1-12	C	X	T	No	No	Yes					2		FF	2
466	20I-11-0000	B1-12	C	Z	O	No	No	Yes					2		FF	2
491	19D-21-0000	B1-08	C	D	T	No	No	Yes	83.57	56.78	39.47		211	B	C	4
492	19D-21-0000	B1-08	C	W	O	No	No	Yes					250	N	C	4
493	19D-21-0000	B1-08	C	C	O	No	No	Yes	44.28	16.49	53				F	4
494	19D-21-0000	B1-08	C	C	O	No	No	Yes	88.2	56.3	31.77		135	S	F	4
502	19D-21-0000	B1-08	C	D	T	No	No	Yes					58		K	4
509	19D-21-0000	B1-08	C	D	T	No	No	Yes					23		FF	4
522	20I-11-0000	B1-12	C	X	O	No	No	Yes					28		F	4
524	20I-11-0000	B1-12	C	C	T	No	No	Yes					10		F	2
526	20I-11-0000	B1-12	C	C	T	No	No	Yes					4		FF	2
561	19D-17-0000	B1-06	C	C	T	No	No	Yes					22		F	3
571	19D-17-0000	B1-06	C	D	T	No	No	Yes					8		F	2
572	19D-17-0000	B1-06	C	D	T	No	No	Yes					4		F	2
577	19D-17-0000	B1-06	C	X	O	No	No	Yes					6		F	2
578	19D-17-0000	B1-06	C	X	O	No	No	Yes					5		FF	2
579	19D-17-0000	B1-06	C	W	O	No	No	Yes					4		FF	2
585	19D-20-0000	B1-08	C	C	T	No	No	Yes					88		K	4
589	19D-20-0000	B1-08	Z	X	T	No	No	Yes					2		F	2
594	19D-20-0000	B1-08	C	C	T	No	No	Yes					11		FF	2
595	19D-20-0000	B1-08	C	C	T	No	No	Yes					9		F	2
601	20I-11-0000	B1-12	C	C	O	No	No	Yes					6		FF	3
603	20I-11-0000	B1-12	C	C	O	No	No	Yes					5		F	3
604	20I-11-0000	B1-12	C	C	T	No	No	Yes					25		F	2
613	20I-11-0000	B1-12	Q	Z	T	No	No	Yes					5		HF	2
618	20I-11-0000	B1-12	C	C	T	No	No	Yes					2		FF	2
636	19D-15-0000	B1-06	C	T	O	No	No	Yes					3		FF	2
643	19D-15-0000	B1-06	C	C	T	No	No	Yes					57		F	4
644	19D-15-0000	B1-06	C	C	T	No	No	Yes					49		K	3
650	19D-15-0000	B1-06	C	C	T	No	No	Yes					20		FF	4
662	19D-15-0000	B1-06	C	C	T	No	No	Yes					2		FF	2
720	20C-19-0000	B1-07	C	C	T	No	No	Yes					30		FF	4
721	20C-19-0000	B1-07	C	X	O	No	No	Yes					106		K	4
724	20C-19-0000	B1-07	C	X	O	No	No	Yes					73		F	4
726	20C-19-0000	B1-07	C	D	T	No	No	Yes					20		K	3
727	20C-19-0000	B1-07	C	D	T	No	No	Yes					32		F	4
729	20C-19-0000	B1-07	C	X	O	No	No	Yes					6		FF	3
734	20C-19-0000	B1-07	C	X	T	No	No	Yes					2		FF	2
737	20C-19-0000	B1-07	C	D	T	No	No	Yes					13		F	4
739	20C-19-0000	B1-07	C	C	T	No	No	Yes	23.61	20.44	4.81		3	C	F	3
748	20C-19-0000	B1-07	C	C	T	No	No	Yes					2		FF	2
750	20C-19-0000	B1-07	C	G	O	No	No	Yes					2		FF	1
756	20C-19-0000	B1-07	Q	Z	O	No	No	Yes					17		F	3
757	20C-19-0000	B1-07	Z	Z	O	No	No	Yes					0.5		HF	1

785	20C-19-0000	B1-07	C	C	T	No	No	Yes				68		K	2
802	15N-69-0000	B1-04	C	C	T	No	No	Yes				5		FF	3
805	15N-69-0000	B1-04	C	D	T	No	No	Yes				12		F	4
809	15N-69-0000	B1-04	C	W	O	No	No	Yes				24		FF	4
811	15N-69-0000	B1-04	C	W	O	No	No	Yes				43		FF	4
840	15N-59-0000	B1-04	C	T	O	No	No	Yes				39		FF	4
843	15N-59-0000	B1-04	C	G	O	No	No	Yes				128		C	4
848	15N-59-0000	B1-04	C	W	O	No	No	Yes				45		FF	4
854	15N-59-0000	B1-04	C	T	O	No	No	Yes				6		FF	3
859	15N-59-0000	B1-04	C	W	O	No	No	Yes				120		FF	4
860	15N-59-0000	B1-04	C	W	O	No	No	Yes				225		FF	4
924	15N-42-0000	B1-03-G	C	T	O	No	No	Yes	70.15	41.77	23.88	55		FF	4
925	15N-42-0000	B1-03-G	C	T	O	No	No	Yes				14		FF	4
933	15N-69-0000	B1-04	C	C	T	No	No	Yes				12		FF	2
944	15N-69-0000	B1-04	C	X	O	No	No	Yes				23		F	4
948	15N-69-0000	B1-04	C	C	T	No	No	Yes				47		F	4
949	15N-69-0000	B1-04	C	D	T	No	No	Yes				44		F	4
1049	15N-44-0000	B1-03-H	C	D	O	No	No	Yes				14		F	3
1053	15N-44-0000	B1-03-H	C	G	O	No	No	Yes				74		F	4
1054	15N-44-0000	B1-03-H	C	T	O	No	No	Yes				9		F	3
1056	15N-44-0000	B1-03-H	C	X	O	No	No	Yes				49		F	4
1058	15N-44-0000	B1-03-H	C	X	O	No	No	Yes				81		FF	4
1059	15N-44-0000	B1-03-H	C	X	O	No	No	Yes	55.56	47.92	30.86	62	C	F	4
1146	15N-25-0000	B1-03-E	C	C	T	No	No	Yes				22		F	4
1150	15N-69-0000	B1-04	C	C	T	No	No	Yes				22		F	4
1160	15N-42-0000	B1-03-G	C	X	O	No	No	Yes				26		K	4
1173	15N-44-0000	B1-03-H	C	C	T	No	No	Yes				12		F	3
1182	15N-44-0000	B1-03-H	C	C	T	No	No	Yes				2		FF	2
1183	15N-44-0000	B1-03-H	C	C	T	No	No	Yes				3		FF	3
1186	15N-44-0000	B1-03-H	C	C	T	No	No	Yes				0.5		FF	2
1197	15N-44-0000	B1-03-H	C	C	O	No	No	Yes				48		F	4
1210	15N-44-0000	B1-03-H	C	X	O	No	No	Yes				18		HF	3
1211	15N-44-0000	B1-03-H	C	X	O	No	No	Yes				8		F	2
1212	15N-44-0000	B1-03-H	C	G	O	No	No	Yes	34.88	25	12.97	8	C	F	3
1216	15N-44-0000	B1-03-H	C	G	O	No	No	Yes				15		FF	2
1217	15N-44-0000	B1-03-H	Z	T	O	No	No	Yes				0.5		HF	2
1218	15N-44-0000	B1-03-H	Z	W	O	No	No	Yes				5		FF	3
1312	15N-69-0000	B1-04	C	W	O	No	No	Yes				10		FF	2
1314	15N-69-0000	B1-04	C	W	O	No	No	Yes				4		FF	2
1315	15N-69-0000	B1-04	C	W	O	No	No	Yes				11		FF	2
1328	15N-42-0000	B1-03-G	C	X	O	No	No	Yes				25		F	4
1340	20C-19-0000	B1-07	C	D	T	No	No	Yes				25		FF	3
1341	20C-19-0000	B1-07	C	D	T	No	No	Yes				69		F	4
1368	20C-3-0000	B1-05	C	D	T	No	No	Yes				11		F	3
1379	20C-3-0000	B1-05	C	X	O	No	No	Yes				2		HF	2
1384	20C-3-0000	B1-05	C	X	T	No	No	Yes				2		F	2
1420	20A-3 C1:2000	B1-04	C	W	O	No	No	Yes				17		F	4
1424	20A-3 C1:2000	B1-04	C	X	O	No	No	Yes				53		K	4
1435	20A-8 C1:2000	B1-04	C	X	O	No	No	Yes				42	S	F	3
1442	20A-8 C1:2000	B1-04	C	C	T	No	No	Yes				4		F	2
1443	20A-8 C1:2000	B1-04	C	C	T	No	No	Yes				3		F	2
1446	20A-8 C1:2000	B1-04	C	C	T	No	No	Yes				2		F	2
1451	20A-8 C1:2000	B1-04	C	W	O	No	No	Yes				7		F	3
1474	20C-3-0000	B1-05	C	D	T	No	No	Yes				30		F	4

1478	20C-3-0000	B1-05	C	X	T	No	No	Yes				34	F	4	
1479	20C-3-0000	B1-05	C	D	O	No	No	Yes				80	K	4	
1483	20C-3-0000	B1-05	C	D	T	No	No	Yes				5	C	F	3
1487	20C-3-0000	B1-05	C	D	T	No	No	Yes				9	F	4	
1555	20A-6-0000	B1-04	C	C	T	No	No	Yes				24	F	3	
1574	20B-1-0000	B1-05	L	Z	O	No	No	Yes				14	C	F	2
1575	20B-1-0000	B1-05	C	Z	O	No	No	Yes				16		FF	2
1659	20C-1-0000	B1-05	C	C	T	No	No	Yes				57		K	4
1663	20C-1-0000	B1-05	C	D	O	No	No	Yes	35.53	31.49	15.98	16	C	F	2
1678	20C-1-0000	B1-05	C	X	O	No	No	Yes				20		F	4
1679	20C-1-0000	B1-05	C	C	T	No	No	Yes				35		F	3
1681	20C-1-0000	B1-05	C	D	O	No	No	Yes				34		K	4
1685	20C-1-0000	B1-05	C	D	P	No	No	Yes				14		F	3
1699	20C-5-0000	B1-05	C	C	O	No	No	Yes				21		F	4
1700	20C-5-0000	B1-05	C	C	T	No	No	Yes				24		F	3
1704	20C-5-0000	B1-05	C	X	O	No	No	Yes				18		F	3
1705	20C-5-0000	B1-05	C	G	T	No	No	Yes				7		F	3
1714	20C-5-0000	B1-05	C	C	T	No	No	Yes	32.2	19.37	6.85	6	S	F	2
1721	20C-5-0000	B1-05	C	D	T	No	No	Yes				0.5		F	2
1729	20A-6-0000	B1-04	Z	Z	O	No	No	Yes				12		F	2
1743	20A-6-0000	B1-04	C	D	T	No	No	Yes				4		F	2
1753	20A-6-0000	B1-04	C	C	T	No	No	Yes				0.5		FF	2
1756	20A-6-0000	B1-04	C	Z	O	No	No	Yes				7		F	3
1761	20A-6-0000	B1-04	C	X	T	No	No	Yes	25.5	11.52	4.74	3		F	2
1797	20D-9-0000	B1-08	C	C	T	No	No	Yes	37.61	32.26	17.71	24	C	F	3
1803	20D-9-0000	B1-08	C	X	O	No	No	Yes				5		F	2
1809	20D-9-0000	B1-08	C	C	T	No	No	Yes				7	C	F	2
1815	20D-9-0000	B1-08	C	C	T	No	No	Yes				5		F	2
1826	20D-9-0000	B1-08	C	C	T	No	No	Yes				1		FF	2
1828	20D-9-0000	B1-08	C	C	O	No	No	Yes				2		F	2
1829	20D-9-0000	B1-08	C	C	T	No	No	Yes				1		F	1
1831	20D-9-0000	B1-08	C	D	T	No	No	Yes				2		F	2
1836	20D-9-0000	B1-08	C	C	T	No	No	Yes				1		FF	1
1880	20D-9-0000	B1-08	C	D	T	No	No	Yes				34		C	2
1885	20D-8-0000	B1-08	Z	Z	O	No	No	Yes				2		HF	2
1886	20D-8-0000	B1-08	C	D	T	No	No	Yes				10		F	2
1897	20D-8-0000	B1-08	C	C	T	No	No	Yes				25		F	3
1925	20A-6-0000	B1-04	C	W	T	No	No	Yes				61		F	4
1927	20A-6-0000	B1-04	C	D	T	No	No	Yes				98		F	4
1928	20A-6-0000	B1-04	C	C	T	No	No	Yes				31		F	4
1931	20A-6-0000	B1-04	C	C	T	No	No	Yes	41.75	23.73	11.05	10	C	F	3
1956	20A-6-0000	B1-04	C	X	T	No	No	Yes				61		F	4
1958	20A-6-0000	B1-04	C	D	T	No	No	Yes				98		F	4
1959	20A-6-0000	B1-04	C	C	T	No	No	Yes				31		F	4
1962	20A-6-0000	B1-04	C	C	T	No	No	Yes	41.75	23.73	11.05	10	C	F	3
1963	15N-69-0000	B1-04	C	G	O	No	No	Yes	70.33	68.08	59.41	312		HF	4
1964	15N-69-0000	B1-04	C	D	T	No	No	Yes				79		F	4
1973	15N-69-0000	B1-04	Z	W	O	No	No	Yes				73		F	4
1974	15N-69-0000	B1-04	C	D	T	No	No	Yes				53		F	4
1975	15N-69-0000	B1-04	C	D	T	No	No	Yes				11		F	3
1976	15N-69-0000	B1-04	C	D	T	No	No	Yes				22		F	3
1978	15N-69-0000	B1-04	C	X	T	No	No	Yes				92		F	4
1986	15N-69-0000	B1-04	C	W	O	No	No	Yes				7		F	2
2046	20A-13-0000	B1-13	C	X	T	No	No	Yes				2		FF	1

2091	20A-13-0000	B1-13	C	D	O	No	No	Yes				16		F	2
2098	20A-13-0000	B1-13	C	C	T	No	No	Yes				9		F	2
2099	20A-13-0000	B1-13	C	X	T	No	No	Yes				8	C	F	2
2111	20A-13-0000	B1-13	C	G	O	No	No	Yes				54		F	4
2122	20A-13-0000	B1-13	Z	Z	O	No	No	Yes				5		HF	3
2123	20A-13-0000	B1-13	C	C	O	No	No	Yes				4		F	2
2124	20A-13-0000	B1-13	C	C	O	No	No	Yes				36		F	4
2125	20A-13-0000	B1-13	C	C	O	No	No	Yes				33		F	4
2126	20A-13-0000	B1-13	C	C	T	No	No	Yes				11		F	4
2127	20A-13-0000	B1-13	C	C	T	No	No	Yes				12		F	3
2128	20A-13-0000	B1-13	C	C	T	No	No	Yes				8		F	3
2131	20A-13-0000	B1-13	C	C	T	No	No	Yes				38		K	4
2133	20J-20-0000	B1-13	C	P	O	No	No	Yes				146		C	4
2134	20J-20-0000	B1-13	C	X	O	No	No	Yes				41		C	4
2136	20J-20-0000	B1-13	C	X	O	No	No	Yes				15		F	3
2137	20J-20-0000	B1-13	C	X	O	No	No	Yes				26		F	4
2221	15N-118-656	B1-04	C	C	O	No	No	Yes				316		C	4
2222	15N-118-656	B1-04	C	D	T	No	No	Yes				205		C	4
2223	15N-118-656	B1-04	C	C	T	No	No	Yes				160		C	4
2224	15N-118-656	B1-04	C	X	O	No	No	Yes				283		C	4
2225	15N-118-656	B1-04	C	X	O	No	No	Yes				538		C	4
2226	15N-118-656	B1-04	C	X	T	No	No	Yes				290		C	4
2227	15N-118-656	B1-04	C	X	O	No	No	Yes				435		C	4
2228	15N-118-656	B1-04	C	X	T	No	No	Yes				410		C	4
2229	15N-118-656	B1-04	C	W	T	No	No	Yes				451		C	4
2232	15N-118-656	B1-04	C	D	T	No	No	Yes				173		C	4
2241	20C-28-1110	B1-08	C	C	T	No	No	Yes				0.5		FF	2
2243	20E-1-1150	B1-10	Q	C	T	No	No	Yes				2		HF	1
2284	20A-13-0000	B1-13	C	C	T	No	No	Yes				5		FF	1
2290	20A-13-0000	B1-13	C	C	O	No	No	Yes				4		FF	1
2300	20A-13-0000	B1-13	C	C	T	No	No	Yes				2		FF	1
2302	20A-13-0000	B1-13	C	C	T	No	No	Yes				1		FF	1
2309	20A-13-0000	B1-13	C	C	O	No	No	Yes				65		C	3
2310	20A-13-0000	B1-13	C	D	T	No	No	Yes				19		F	2
2339	20A-13-0000	B1-13	C	G	O	No	No	Yes				39		F	2
2343	20A-13-0000	B1-13	C	G	T	No	No	Yes				7		FF	1
2352	20A-13-0000	B1-13	C	C	O	No	No	Yes				67		F	2
2353	20A-13-0000	B1-13	C	C	T	No	No	Yes				5		F	2
2359	20A-13-0000	B1-13	C	C	T	No	No	Yes				12		FF	2
2362	20A-13-0000	B1-13	C	C	T	No	No	Yes				2		FF	2
2363	20A-13-0000	B1-13	C	X	O	No	No	Yes				9		FF	3
2371	20A-13-0000	B1-13	C	D	T	No	No	Yes				12		F	2
2373	20A-13-0000	B1-13	C	C	T	No	No	Yes				5		FF	2
2381	20A-13-0000	B1-13	C	C	T	No	No	Yes				2		FF	1
2383	20A-13-0000	B1-13	C	C	T	No	No	Yes				2		FF	2
2385	20A-13-0000	B1-13	C	C	T	No	No	Yes				4		FF	2
2387	20A-13-0000	B1-13	C	C	T	No	No	Yes				8		FF	2
2417	20A-21-1046	B1-08	Q	C	T	No	No	Yes				4		FF	2
2469	20j-20-0000	B1-13	C	C	T	No	No	Yes				34		F	4
2475	20j-20-0000	B1-13	C	C	O	No	No	Yes				444		C	4
2476	20j-20-0000	B1-13	C	C	O	No	No	Yes				3		F	2
2481	20j-20-0000	B1-13	C	X	T	No	No	Yes				82		F	4
2488	20A-18-0000	B1-13	C	C	O	No	No	Yes				54		F	4
2499	20A-18-0000	B1-13	C	X	T	No	No	Yes				8		FF	3

2513	20F-3-0000	B1-13	C	C	O	No	No	Yes				8		F	2
2520	20F-3-0000	B1-13	C	D	T	No	No	Yes				3		FF	3
2523	20F-3-0000	B1-13	C	D	T	No	No	Yes				18		F	3
2529	20F-3-0000	B1-13	C	X	O	No	No	Yes				91		F	4
2548	20A-15-0000	B1-13	C	C	T	No	No	Yes				115		K	4
2549	20A-15-0000	B1-13	C	D	T	No	No	Yes				27		F	4
2550	20A-15-0000	B1-13	C	C	T	No	No	Yes				34		F	4
2555	20A-15-0000	B1-13	C	C	T	No	No	Yes				7		F	3
2581	20J-20-0000	B1-13	C	X	T	No	No	Yes				671		C	4
2584	20A-15-0000	B1-13	C	X	O	No	No	Yes				40		F	4
2586	20A-15-0000	B1-13	C	C	T	No	No	Yes				43		FF	4
2600	20J-20-0000	B1-13	C	X	O	No	No	Yes				32		F	4
2606	20J-20-0000	B1-13	Z	Z	O	No	No	Yes				0.5		HF	2
2612	20J-20-0000	B1-13	C	C	T	No	No	Yes				5		F	2
2613	20J-20-0000	B1-13	C	C	T	No	No	Yes				19		F	3
2618	20J-20-0000	B1-13	C	C	O	No	No	Yes				2		F	2
2619	20J-20-0000	B1-13	C	C	T	No	No	Yes				2		FF	2
2630	20F-3-0000	B1-13	Z	Z	O	No	No	Yes				22		HF	3
2636	20F-3-0000	B1-13	C	G	T	No	No	Yes				8		F	3
2649	19D-6-0000	B1-02	C	W	O	No	No	Yes				4		FF	2
2651	19D-6-0000	B1-02	C	C	T	No	No	Yes				21		FF	4
2654	19D-6-0000	B1-02	C	C	T	No	No	Yes				8		F	2
2661	19D-6-0000	B1-02	C	C	T	No	No	Yes				4		FF	2
2665	19D-6-0000	B1-02	C	C	T	No	No	Yes				5		F	2
2667	19D-6-0000	B1-02	C	C	T	No	No	Yes				4		F	2
2668	19D-6-0000	B1-02	C	C	T	No	No	Yes				3		FF	2
2672	19D-6-0000	B1-02	C	G	T	No	No	Yes				34		F	4
2679	19D-6-0000	B1-02	C	X	O	No	No	Yes				14		F	3
2681	19D-6-0000	B1-02	C	X	O	No	No	Yes				16		F	4
2682	19D-6-0000	B1-02	Q	Z	O	No	No	Yes				19		HF	3
2689	20A-15-0000	B1-13	C	C	T	No	No	Yes				52		F	4
2690	20A-15-0000	B1-13	C	D	T	No	No	Yes				13		F	3
2691	20A-15-0000	B1-13	C	D	T	No	No	Yes				4		F	2
2699	20A-15-0000	B1-13	C	X	O	No	No	Yes				5		F	3
2716	20A-15-0000	B1-13	C	C	T	No	No	Yes	27.25	22.69	6.54	3	S	F	2
2718	20A-15-0000	B1-13	C	C	T	No	No	Yes				3		F	2
2719	20B-13-0000	B1-13	C	C	O	No	No	Yes				2		F	2
2720	20B-13-0000	B1-13	C	C	O	No	No	Yes				1		F	2
2721	20B-13-0000	B1-13	C	C	O	No	No	Yes				1		FF	2
2722	20B-13-0000	B1-13	C	C	O	No	No	Yes				1		F	2
2744	20B-13-0000	B1-13	C	C	O	No	No	Yes				4		F	2
2746	20B-13-0000	B1-13	C	C	T	No	No	Yes				4		F	3
2752	20B-13-0000	B1-13	C	C	T	No	No	Yes				3		FF	2
2757	20B-13-0000	B1-13	C	C	T	No	No	Yes				8		F	3
2761	20B-13-0000	B1-13	C	C	T	No	No	Yes				7		FF	4
2762	20B-13-0000	B1-13	C	C	T	No	No	Yes				11		F	2
2763	20B-13-0000	B1-13	C	C	T	No	No	Yes	31.67	20.44	8.48	6	C	F	2
2768	20B-13-0000	B1-13	C	C	T	No	No	Yes				12		F	2
2777	20B-13-0000	B1-13	C	W	O	No	No	Yes				45		F	4
2778	20B-13-0000	B1-13	C	W	O	No	No	Yes				62		C	3
2800	20B-13-0000	B1-13	C	C	T	No	No	Yes	53.47	45.95	31.98	72	S	K	4
2802	20B-13-0000	B1-13	C	C	T	No	No	Yes				57		F	4
2804	20B-13-0000	B1-13	C	C	T	No	No	Yes				18	S	F	4
2805	20B-13-0000	B1-13	C	C	T	No	No	Yes				14		F	4

2806	20B-13-0000	B1-13	C	C	O	No	No	Yes				116		F	4
2807	20B-13-0000	B1-13	C	C	T	No	No	Yes				21		F	4
2811	20B-13-0000	B1-13	C	C	O	No	No	Yes				13		F	3
2818	20B-10-0000	B1-13	C	D	T	No	No	Yes				5		FF	2
2820	20B-10-0000	B1-13	C	C	T	No	No	Yes				6		F	2
2833	20B-13-0000	B1-13	C	C	O	No	No	Yes				168		F	4
2843	20B-13-0000	B1-13	C	D	T	No	No	Yes				5		F	2
2848	20B-13-0000	B1-13	C	X	O	No	No	Yes				89		C	4
2873	20B-10-0000	B1-13	C	C	O	No	No	Yes				8		F	3
2874	20B-10-0000	B1-13	C	C	O	No	No	Yes				4		FF	2
2878	20B-10-0000	B1-13	C	X	O	No	No	Yes				2		FF	2
2882	20B-10-0000	B1-13	C	C	T	No	No	Yes				11		F	3
2884	20B-10-0000	B1-13	C	C	O	No	No	Yes				8		F	3
2891	20B-11-0000	B1-13	C	X	O	No	No	Yes				8		FF	3
2894	20B-11-0000	B1-13	C	C	O	No	No	Yes				5		F	2
2898	20B-11-0000	B1-13	C	X	O	No	No	Yes				6		F	2
2899	20B-11-0000	B1-13	C	C	O	No	No	Yes				8		F	2
2900	20B-11-0000	B1-13	C	C	T	No	No	Yes				7		F	2
2902	20B-11-0000	B1-13	C	C	O	No	No	Yes				15		F	3
2919	20B-11-0000	B1-13	C	C	T	No	No	Yes				6		F	2
2931	20A-18-0000	B1-13	C	C	T	No	No	Yes				43		F	4
2932	20A-18-0000	B1-13	C	C	T	No	No	Yes	41.93	21.53	7.54	10	S	F	3
2933	20A-18-0000	B1-13	C	C	O	No	No	Yes				30		F	4
2936	20A-18-0000	B1-13	C	C	T	No	No	Yes				8		F	3
2941	20A-18-0000	B1-13	C	C	T	No	No	Yes				9		F	3
2946	20A-18-0000	B1-13	C	C	T	No	No	Yes				5		F	3
2950	20B-11-0000	B1-13	C	D	T	No	No	Yes				22		F	4
2957	20A-15-0000	B1-13	C	C	T	No	No	Yes				6		FB	3
2959	20A-15-0000	B1-13	C	C	T	No	No	Yes				6		F	2
2972	20A-15-0000	B1-13	C	C	T	No	No	Yes				2		F	2
2974	20A-15-0000	B1-13	C	C	T	No	No	Yes				5		F	3
2975	20A-15-0000	B1-13	C	D	T	No	No	Yes				4		F	2
2983	20A-18-0000	B1-13	C	C	O	No	No	Yes				248		C	4
2984	20A-18-0000	B1-13	C	C	T	No	No	Yes				224		C	4
2985	20A-18-0000	B1-13	C	D	T	No	No	Yes				77		K	3
2986	20A-18-0000	B1-13	C	D	T	No	No	Yes				15		F	4
2987	20A-18-0000	B1-13	Z	W	O	No	No	Yes				10		HF	2
2989	20A-18-0000	B1-13	C	X	O	No	No	Yes				19		F	3
2993	20A-15-0000	B1-13	C	D	T	No	No	Yes				19		F	4
2994	20A-15-0000	B1-13	C	D	T	No	No	Yes				8		F	3
3030	20B-11-0000	B1-13	C	C	T	No	No	Yes				4		F	2
3031	20B-11-0000	B1-13	C	C	T	No	No	Yes				2		F	2
3034	20B-11-0000	B1-13	C	C	T	No	No	Yes				5		F	2
3035	20B-11-0000	B1-13	C	C	T	No	No	Yes				5		F	2
3038	20B-11-0000	B1-13	C	C	O	No	No	Yes				4		FF	2
3040	20B-11-0000	B1-13	C	C	T	No	No	Yes	22.72	18.85	7.4	4	C	F	2
3046	20B-11-0000	B1-13	C	C	T	No	No	Yes				4		FF	2
3055	20B-11-0000	B1-13	C	C	O	No	No	Yes				3		F	2
3058	20B-11-0000	B1-13	C	C	T	No	No	Yes				1		FF	2
3080	20B-11-0000	B1-13	C	C	T	No	No	Yes				5		FF	2
3100	20B-11-0000	B1-13	C	D	T	No	No	Yes				7		FF	2
3120	20J-20-0000	B1-13	C	C	T	No	No	Yes				101		F	4
3121	20J-20-0000	B1-13	C	C	T	No	No	Yes				17		F	4
3124	20J-20-0000	B1-13	C	C	T	No	No	Yes				4	C	F	1

3132	20J-20-0000	B1-13	C	C	O	No	No	Yes				0.5		FF	1
3229	20A-13-901	B1-13	C	C	T	No	No	Yes				3		FF	2
3284	20F-3-0000	B1-13	C	C	O	No	No	Yes				6		FF	2
3298	20F-3-0000	B1-13	C	C	T	No	No	Yes				3		FF	2
3304	20F-3-0000	B1-13	C	C	O	No	No	Yes				6		F	3
3306	20F-3-0000	B1-13	C	C	O	No	No	Yes				8		FF	3
3311	20A-13-0000	B1-13	C	C	O	No	No	Yes				2		FF	2
3320	15N-138-0000	B1-05	C	C	O	No	No	Yes				6		FF	2
3358	15N-138-0000	B1-05	C	C	O	No	No	Yes				31		F	4
3363	15N-138-0000	B1-05	C	C	T	No	No	Yes				24		FF	3
3367	15N-138-0000	B1-05	C	C	T	No	No	Yes	42.09	30.23	21.69	22	C	FF	3
3369	15N-122-0000	B1-04	C	X	O	No	No	Yes				64		FF	3
3370	15N-122-0000	B1-04	C	X	T	No	No	Yes				7		F	3
3376	15N-141-0000	B1-05	C	C	O	No	No	Yes				6		K	3
3379	15N-141-0000	B1-05	C	C	T	No	No	Yes				0.5		FF	2
3380	15N-141-0000	B1-05	C	C	T	No	No	Yes				2		FF	2
3383	15N-141-0000	B1-05	C	C	O	No	No	Yes				2		FF	3
3392	15N-141-0000	B1-05	C	C	O	No	No	Yes				26		F	3
3393	15N-141-0000	B1-05	C	D	T	No	No	Yes				220		F	4
3395	15N-126-0000	B1-05	C	C	T	No	No	Yes				34		K	4
3396	15N-126-0000	B1-05	C	C	T	No	No	Yes				83		FF	3
3397	15N-126-0000	B1-05	C	C	O	No	No	Yes				4		FF	2
3404	15N-143-0000	B1-05	C	C	O	No	No	Yes				1014	B	HS	4
3411	15N-122-0000	B1-04	C	C	T	No	No	Yes				27		F	4
3432	15N-137-0000	B1-05	C	X	T	No	No	Yes				54		F	4
3440	15N-137-0000	B1-05	C	C	T	No	No	Yes				2		FF	2
3454	15N-124-0000	B1-04	C	X	O	No	No	Yes				41		FF	4
3456	15N-124-0000	B1-04	C	C	O	No	No	Yes				4		FF	3
3460	15N-145-0000	B1-05	C	C	T	No	No	Yes				145		C	4
3461	15N-145-0000	B1-05	Z	X	T	No	No	Yes				25		HF	3
3462	15N-145-0000	B1-05	C	X	T	No	No	Yes				84		F	4
3469	15N-122-0000	B1-04	C	C	T	No	No	Yes				41		FF	4
3470	15N-122-0000	B1-04	C	C	T	No	No	Yes				12		FF	2
3473	15N-122-0000	B1-04	C	C	O	No	No	Yes				23		F	4
348	20I-6-0000	B1-12	C	C	T	Yes	No	Yes				15		F	3
356	20I-6-0000	B1-12	C	R	T	Yes	No	Yes				12		F	3
357	20I-6-0000	B1-12	C	R	T	Yes	No	Yes				7		FF	3
358	20I-6-0000	B1-12	C	G	O	Yes	No	Yes	51	29.65	11.63	19	C	FF	4
359	20I-6-0000	B1-12	C	G	O	Yes	No	Yes				6		FF	3
364	20I-6-0000	B1-12	C	R	O	Yes	No	Yes				9		FF	3
382	20I-11-0000	B1-12	C	R	O	Yes	No	Yes	61.32	20.53	14.69	17	C	FB	4
386	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				9		FF	2
392	20I-11-0000	B1-12	C	R	O	Yes	No	Yes				2		FF	2
423	20I-11-0000	B1-12	C	X	O	Yes	No	Yes				3		F	2
425	20I-11-0000	B1-12	C	D	O	Yes	No	Yes				21		F	4
426	20I-11-0000	B1-12	C	X	O	Yes	No	Yes				23		FF	4
427	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				19		K	3
429	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				4		F	2
430	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				9		F	2
431	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				4		FF	2
473	20I-11-0000	B1-12	C	G	O	Yes	No	Yes				8		FF	2
474	20I-11-0000	B1-12	C	G	O	Yes	No	Yes				7		FF	2
480	20I-11-0000	B1-12	C	R	O	Yes	No	Yes				3		FF	2
481	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				2		FF	2

487	20I-11-0000	B1-12	C	R	O	Yes	No	Yes				0.5		FF	1
488	20I-11-0000	B1-12	C	R	O	Yes	No	Yes				0.5		FF	1
512	19D-21-0000	B1-08	C	R	T	Yes	No	Yes				12		K	2
518	19D-21-0000	B1-08	C	R	O	Yes	No	Yes				4		FF	3
520	19D-21-0000	B1-08	C	N	O	Yes	No	Yes	21.63	15.17	10.08	2		FF	2
521	19D-21-0000	B1-08	C	R	O	Yes	No	Yes				2		FF	2
543	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				2		F	3
544	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				18		F	2
545	20I-11-0000	B1-12	C	R	T	Yes	No	Yes				4		F	2
553	20I-11-0000	B1-12	C	R	O	Yes	No	Yes				0.5		FF	2
554	20I-11-0000	B1-12	C	B	O	Yes	No	Yes				2		FF	1
639	19D-15-0000	B1-06	C	Z	O	Yes	No	Yes				3		FF	2
645	19D-15-0000	B1-06	C	C	T	Yes	No	Yes				62		F	4
663	19D-15-0000	B1-06	C	W	O	Yes	No	Yes				56		K	4
664	19D-15-0000	B1-06	C	R	T	Yes	No	Yes				37		FF	3
667	19D-15-0000	B1-06	C	R	T	Yes	No	Yes				3		F	3
675	19D-15-0000	B1-06	C	R	T	Yes	No	Yes				18		K	2
677	19D-15-0000	B1-06	C	R	O	Yes	No	Yes				3		F	2
681	19D-15-0000	B1-06	C	R	T	Yes	No	Yes				2		FF	2
684	20C-19-0000	B1-07	C	G	O	Yes	No	Yes				11		FF	2
687	20C-19-0000	B1-07	C	C	T	Yes	No	Yes				40		F	4
688	20C-19-0000	B1-07	C	G	T	Yes	No	Yes				40		F	3
689	20C-19-0000	B1-07	C	C	T	Yes	No	Yes				24		F	3
690	20C-19-0000	B1-07	C	C	T	Yes	No	Yes				72		F	3
691	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				12		F	3
694	20C-19-0000	B1-07	C	G	O	Yes	No	Yes				6		FF	3
697	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				5		F	3
700	20C-19-0000	B1-07	C	R	T	Yes	No	Yes	32.31	26.07	7.62	8	C	F	2
701	20C-19-0000	B1-07	C	R	O	Yes	No	Yes				6		FF	2
711	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				8		F	2
712	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				2		FF	2
713	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				2		F	2
715	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				0.5		FF	1
716	20C-19-0000	B1-07	C	R	O	Yes	No	Yes				2		F	2
751	20C-19-0000	B1-07	C	D	O	Yes	No	Yes				0.5		F	4
753	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				14		FF	3
754	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				15		K	4
755	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				96		F	3
765	20C-19-0000	B1-07	C	X	O	Yes	No	Yes				23		K	4
779	20C-19-0000	B1-07	C	G	O	Yes	No	Yes				2		FF	2
813	15N-69-0000	B1-04	C	X	T	Yes	No	Yes				32		F	4
815	15N-69-0000	B1-04	C	W	O	Yes	No	Yes	69.02	45.08	26.26	85	S	K	4
816	15N-69-0000	B1-04	C	G	O	Yes	No	Yes				41		F	4
817	15N-69-0000	B1-04	C	W	O	Yes	No	Yes				62		F	4
819	15N-69-0000	B1-04	C	G	O	Yes	No	Yes				18		F	4
828	15N-69-0000	B1-04	C	G	O	Yes	No	Yes				6		F	2
831	15N-69-0000	B1-04	C	G	O	Yes	No	Yes				2		F	2
837	15N-69-0000	B1-04	C	T	O	Yes	No	Yes				27		FF	4
866	15N-59-0000	B1-04	C	W	O	Yes	No	Yes				179		K	4
867	15N-59-0000	B1-04	C	G	O	Yes	No	Yes				92		K	4
869	15N-59-0000	B1-04	C	R	T	Yes	No	Yes				83		F	4
870	15N-59-0000	B1-04	C	G	O	Yes	No	Yes				32		FF	3
877	15N-59-0000	B1-04	C	Z	O	Yes	No	Yes				10		FF	3
879	15N-59-0000	B1-04	C	X	O	Yes	No	Yes				22		FF	4

880	15N-59-0000	B1-04	C	G	O	Yes	No	Yes				8		FF	3
881	15N-59-0000	B1-04	C	Z	O	Yes	No	Yes				15		FF	3
882	15N-59-0000	B1-04	C	G	O	Yes	No	Yes				7		FF	3
883	15N-59-0000	B1-04	C	Z	O	Yes	No	Yes	56.42	43.62	16.82	36	S	FF	4
917	15N-42-0000	B1-03-G	C	D	T	Yes	No	Yes				11		FF	3
926	15N-42-0000	B1-03-G	C	Z	O	Yes	No	Yes				2		FF	2
931	15N-42-0000	B1-03-G	C	Z	O	Yes	No	Yes				2		FF	2
945	15N-69-0000	B1-04	C	W	O	Yes	No	Yes				10		F	3
947	15N-69-0000	B1-04	C	Z	O	Yes	No	Yes				15		F	3
950	15N-69-0000	B1-04	C	W	O	Yes	No	Yes				22		F	4
1164	15N-42-0000	B1-03-G	C	R	O	Yes	No	Yes				5		FF	3
1166	15N-42-0000	B1-03-G	C	C	O	Yes	No	Yes				8		F	3
1189	15N-44-0000	B1-03-H	C	R	T	Yes	No	Yes				23		FF	4
1192	15N-44-0000	B1-03-H	C	X	O	Yes	No	Yes				17		FF	4
1194	15N-44-0000	B1-03-H	C	R	O	Yes	No	Yes				12		F	3
1206	15N-44-0000	B1-03-H	C	C	T	Yes	No	Yes				0.5		FF	2
1207	15N-44-0000	B1-03-H	C	R	O	Yes	No	Yes				8		FF	3
1303	20C-19-0000	B1-07	C	G	O	Yes	No	Yes				2		FF	2
1305	15N-69-0000	B1-04	C	R	T	Yes	No	Yes				44		F	4
1309	15N-69-0000	B1-04	C	X	O	Yes	No	Yes				23		F	3
1323	15N-69-0000	B1-04	C	W	O	Yes	No	Yes				4		FF	2
1324	15N-69-0000	B1-04	C	X	O	Yes	No	Yes				13		F	3
1346	20C-19-0000	B1-07	C	Z	O	Yes	No	Yes				43		FF	3
1347	20C-19-0000	B1-07	C	C	O	Yes	No	Yes				32		F	4
1348	20C-19-0000	B1-07	C	D	T	Yes	No	Yes				68		K	4
1349	20C-19-0000	B1-07	C	R	O	Yes	No	Yes				7		F	3
1351	20C-19-0000	B1-07	C	X	O	Yes	No	Yes				4		F	2
1355	20C-19-0000	B1-07	C	G	O	Yes	No	Yes				3		F	2
1356	20C-19-0000	B1-07	C	R	T	Yes	No	Yes				3		F	2
1357	20C-19-0000	B1-07	C	R	O	Yes	No	Yes				7		FF	3
1369	20C-3-0000	B1-05	C	W	O	Yes	No	Yes				5		F	2
1419	20A-3 C1:2000	B1-04	C	R	T	Yes	No	Yes				8		F	4
1421	20A-3 C1:2000	B1-04	C	R	T	Yes	No	Yes				3		FF	2
1423	20A-3 C1:2000	B1-04	C	R	O	Yes	No	Yes				13		F	2
1445	20A-8 C1:2000	B1-04	C	R	T	Yes	No	Yes				5		F	2
1467	20C-3-0000	B1-05	C	G	O	Yes	No	Yes				11	C	F	2
1468	20C-3-0000	B1-05	C	G	O	Yes	No	Yes				10	C	F	3
1660	20C-1-0000	B1-05	C	C	T	Yes	No	Yes				22		FF	2
1662	20C-1-0000	B1-05	C	D	T	Yes	No	Yes				9		F	2
1668	20C-1-0000	B1-05	C	C	T	Yes	No	Yes				4		FF	3
1673	20C-1-0000	B1-05	C	R	T	Yes	No	Yes	47.42	45.11	22.13	50	S	F	3
1676	20C-1-0000	B1-05	C	C	T	Yes	No	Yes				37		F	3
1702	20C-5-0000	B1-05	C	X	T	Yes	No	Yes				79		F	4
1717	20C-5-0000	B1-05	C	X	O	Yes	No	Yes				2		F	2
1718	20C-5-0000	B1-05	C	C	T	Yes	No	Yes				0.5		FF	2
1775	20A-6-0000	B1-04	C	R	O	Yes	No	Yes				6		F	2
1780	20A-6-0000	B1-04	C	R	O	Yes	No	Yes				0.5		FF	1
1788	20A-6-0000	B1-04	C	R	O	Yes	No	Yes	22.65	12.29	5.68	0.5		FF	2
1798	20D-9-0000	B1-08	C	C	T	Yes	No	Yes				43		K	4
1800	20D-9-0000	B1-08	C	R	O	Yes	No	Yes				9		F	2
1807	20D-9-0000	B1-08	C	R	T	Yes	No	Yes				14		F	2
1816	20D-9-0000	B1-08	C	R	T	Yes	No	Yes				2		F	3
1817	20D-9-0000	B1-08	C	R	T	Yes	No	Yes	41.14	31.27	8.12	33	C	F	3
1818	20D-9-0000	B1-08	C	R	O	Yes	No	Yes				14		F	2

1850	20D-9-0000	B1-08	C	R	T	Yes	No	Yes				0.5		FF	2
1875	20D-9-0000	B1-08	C	C	T	Yes	No	Yes				1		FF	1
1881	20D-8-0000	B1-08	C	R	T	Yes	No	Yes				18		F	3
1892	20D-8-0000	B1-08	C	Z	O	Yes	No	Yes				1		FF	2
1902	20D-8-0000	B1-08	C	C	O	Yes	No	Yes				49		FF	3
1903	20D-8-0000	B1-08	C	X	O	Yes	No	Yes				54		K	4
1906	20D-8-0000	B1-08	C	W	O	Yes	No	Yes				1		FF	2
1916	20D-8-0000	B1-08	C	R	O	Yes	No	Yes				2		FF	3
1918	20D-8-0000	B1-08	C	R	O	Yes	No	Yes				1		FF	1
1921	20D-8-0000	B1-08	C	R	T	Yes	No	Yes				1		FF	2
1922	20D-8-0000	B1-08	C	G	O	Yes	No	Yes				2		FF	2
1930	20A-6-0000	B1-04	C	R	T	Yes	No	Yes				10		F	3
1933	20D-8-0000	B1-08	C	C	O	Yes	No	Yes				49		K	3
1934	20D-8-0000	B1-08	C	X	O	Yes	No	Yes				54		K	4
1937	20D-8-0000	B1-08	C	W	O	Yes	No	Yes				1		FF	2
1947	20D-8-0000	B1-08	C	R	O	Yes	No	Yes				2		FF	3
1949	20D-8-0000	B1-08	C	R	O	Yes	No	Yes				1		FF	1
1952	20D-8-0000	B1-08	C	R	T	Yes	No	Yes				1		FF	2
1961	20A-6-0000	B1-04	C	R	T	Yes	No	Yes				10		F	3
1972	15N-69-0000	B1-04	C	Z	O	Yes	No	Yes				9		FF	4
1991	15N-69-0000	B1-04	C	W	O	Yes	No	Yes				34		F	4
1996	15N-69-0000	B1-04	C	C	O	Yes	No	Yes				17		F	3
2049	20A-13-0000	B1-13	C	R	O	Yes	No	Yes				20		FF	2
2059	20A-13-0000	B1-13	C	R	T	Yes	No	Yes				6		FF	2
2061	20A-13-0000	B1-13	C	R	T	Yes	No	Yes				5		FF	1
2075	20A-13-0000	B1-13	C	R	T	Yes	No	Yes				0.5		FF	1
2087	20A-13-0000	B1-13	C	C	T	Yes	No	Yes				2		FF	1
2114	20A-13-0000	B1-13	C	C	O	Yes	No	Yes				10		F	3
2115	20A-13-0000	B1-13	C	X	T	Yes	No	Yes				13		F	4
2116	20A-13-0000	B1-13	C	G	T	Yes	No	Yes	35.23	14.97	13.66	9	C	FF	3
2230	15N-118-656	B1-04	C	X	T	Yes	No	Yes				173		C	4
2231	15N-118-656	B1-04	C	X	T	Yes	No	Yes				213		C	4
2293	20A-13-0000	B1-13	C	C	T	Yes	No	Yes				1		FF	1
2296	20A-13-0000	B1-13	C	C	T	Yes	No	Yes				3		F	1
2317	20A-13-0000	B1-13	C	R	T	Yes	No	Yes				14		FF	2
2318	20A-13-0000	B1-13	C	R	O	Yes	No	Yes				7		F	1
2333	20A-13-0000	B1-13	C	X	O	Yes	No	Yes				7		FB	2
2345	20A-13-0000	B1-13	C	G	O	Yes	No	Yes				8		FF	1
2390	15N-170-1164	B1-07	C	C	T	Yes	No	Yes				160		C	4
2453	20C-24-1095	B1-07	C	R	O	Yes	No	Yes				2		FF	2
2453	20C-24-1095	B1-07	C	R	O	Yes	No	Yes				2		FF	2
2454	20C-24-1095	B1-07	C	G	O	Yes	No	Yes				2		F	2
2454	20C-24-1095	B1-07	C	G	O	Yes	No	Yes				2		F	2
2487	20A-18-0000	B1-13	C	R	O	Yes	No	Yes				6		FF	2
2493	20A-18-0000	B1-13	C	R	T	Yes	No	Yes				4		FF	2
2505	20F-3-0000	B1-13	C	R	T	Yes	No	Yes				3		F	2
2561	20A-15-0000	B1-13	C	R	T	Yes	No	Yes				8		F	3
2571	20A-15-0000	B1-13	C	R	O	Yes	No	Yes				2		FF	2
2574	20A-15-0000	B1-13	C	G	T	Yes	No	Yes				13		FF	3
2575	20A-15-0000	B1-13	C	R	T	Yes	No	Yes				13		FF	3
2585	20A-15-0000	B1-13	C	C	T	Yes	No	Yes				25		F	4
2593	20A-15-0000	B1-13	C	D	T	Yes	No	Yes				13		FF	3
2644	20F-3-0000	B1-13	C	R	T	Yes	No	Yes				5		FF	2
2646	20F-3-0000	B1-13	C	X	O	Yes	No	Yes				4		FF	2

2687	20B-13-0000	B1-13	C	C	O	Yes	No	Yes				2		FF	2
2709	20A-15-0000	B1-13	C	R	T	Yes	No	Yes				4		F	3
2713	20A-15-0000	B1-13	C	R	O	Yes	No	Yes				5		FF	2
2741	20B-13-0000	B1-13	C	R	T	Yes	No	Yes				8		F	3
2745	20B-13-0000	B1-13	C	R	T	Yes	No	Yes				10		F	2
2783	20B-13-0000	B1-13	C	R	T	Yes	No	Yes				161		K	4
2784	20B-13-0000	B1-13	C	R	T	Yes	No	Yes				51		F	4
2788	20B-13-0000	B1-13	C	R	T	Yes	No	Yes				12		F	2
2789	20B-13-0000	B1-13	C	C	T	Yes	No	Yes				27		F	4
2790	20B-13-0000	B1-13	C	R	O	Yes	No	Yes				30		F	4
2791	20B-13-0000	B1-13	C	W	O	Yes	No	Yes				7		F	4
2798	20B-13-0000	B1-13	C	R	O	Yes	No	Yes				3		F	2
2849	20B-10-0000	B1-13	C	D	T	Yes	No	Yes				102		F	4
2856	20B-10-0000	B1-13	C	R	O	Yes	No	Yes				7		F	3
2865	20B-10-0000	B1-13	C	R	T	Yes	No	Yes				15		FF	3
2871	20B-10-0000	B1-13	C	C	O	Yes	No	Yes				19		F	3
2915	20B-11-0000	B1-13	C	C	T	Yes	No	Yes				8		FF	2
2921	20A-18-0000	B1-13	C	C	T	Yes	No	Yes				16		F	3
2922	20A-18-0000	B1-13	C	X	O	Yes	No	Yes				19		FF	3
2928	20A-18-0000	B1-13	C	R	T	Yes	No	Yes				2		FF	2
2990	20A-18-0000	B1-13	C	X	O	Yes	No	Yes				2		FF	2
2992	20A-18-0000	B1-13	C	C	O	Yes	No	Yes				13		F	3
3002	20A-15-0000	B1-13	C	X	O	Yes	No	Yes				10		FF	3
3013	20A-15-0000	B1-13	C	C	T	Yes	No	Yes				2		FF	2
3060	20B-11-0000	B1-13	C	R	T	Yes	No	Yes				19		F	3
3065	20B-11-0000	B1-13	C	R	O	Yes	No	Yes				8		FF	2
3066	20B-11-0000	B1-13	C	C	T	Yes	No	Yes	40.51	31.65	18.14	21	S	F	3
3073	20B-11-0000	B1-13	C	R	T	Yes	No	Yes				6		FF	2
3075	20B-11-0000	B1-13	C	R	O	Yes	No	Yes				6		FF	2
3077	20B-11-0000	B1-13	C	R	T	Yes	No	Yes				7		FF	2
3078	20B-11-0000	B1-13	C	R	O	Yes	No	Yes				5		FF	2
3081	20B-11-0000	B1-13	C	G	O	Yes	No	Yes				6		FF	2
3086	20B-11-0000	B1-13	C	R	O	Yes	No	Yes				12		F	3
3099	20B-11-0000	B1-13	C	R	T	Yes	No	Yes				3		FF	2
3101	20J-20-0000	B1-13	C	R	T	Yes	No	Yes				49		F	4
3102	20J-20-0000	B1-13	C	R	T	Yes	No	Yes				12		FF	3
3167	20B-11-996	B1-13	C	R	O	Yes	No	Yes				4		FF	2
3232	20A-13-901	B1-13	C	C	T	Yes	No	Yes				0.5		FF	2
3235	20A-13-901	B1-13	C	R	T	Yes	No	Yes				0.5		FF	2
3241	20B-11-997	B1-13	C	R	T	Yes	No	Yes				0.5		FF	2
3242	20B-11-997	B1-13	C	R	T	Yes	No	Yes				2		FF	2
3282	20F-3-0000	B1-13	C	R	T	Yes	No	Yes				6		FF	2
3285	20F-3-0000	B1-13	C	R	O	Yes	No	Yes				15		F	3
3337	15N-126-0000	B1-05	C	R	O	Yes	No	Yes				0.5		FF	1
3349	15N-138-0000	B1-05	C	W	O	Yes	No	Yes				6		FF	3
3352	15N-138-0000	B1-05	C	R	O	Yes	No	Yes	24.97	188.52	11.08	4	C	FF	2
3386	15N-141-0000	B1-05	C	R	O	Yes	No	Yes				5		FF	2
3387	15N-141-0000	B1-05	C	R	O	Yes	No	Yes				2		FF	2
3398	15N-126-0000	B1-05	C	R	O	Yes	No	Yes				7		FF	3
3399	15N-126-0000	B1-05	C	C	O	Yes	No	Yes				0.5		FF	2
3407	15N-143-0000	B1-05	C	C	T	Yes	No	Yes	92.85	51.43	30.98	161	S	F	4
3447	15N-137-0000	B1-05	C	Z	O	Yes	No	Yes				6		F	3
3449	15N-137-0000	B1-05	C	C	O	Yes	No	Yes	45.76	24.51	8.42	11	C	F	4
159	19D-9-0000	B1-02	C	C	T	No	Yes	Yes				2		FF	2

233	20I-10-0000	B1-12	C	D	O	No	Yes	Yes				31		F	4
568	19D-17-0000	B1-06	C	C	T	No	Yes	Yes				2		F	2
647	19D-15-0000	B1-06	C	D	T	No	Yes	Yes				45		FF	4
740	20C-19-0000	B1-07	C	C	T	No	Yes	Yes				6		F	3
781	20C-19-0000	B1-07	C	W	O	No	Yes	Yes				3		F	2
799	15N-69-0000	B1-04	C	X	O	No	Yes	Yes				28		F	4
807	15N-69-0000	B1-04	C	D	T	No	Yes	Yes				23		FF	4
842	15N-59-0000	B1-04	C	D	O	No	Yes	Yes				30		K	3
847	15N-59-0000	B1-04	C	D	T	No	Yes	Yes				44		F	4
857	15N-59-0000	B1-04	C	C	T	No	Yes	Yes				92		K	4
858	15N-59-0000	B1-04	C	C	T	No	Yes	Yes				159		FF	4
864	15N-59-0000	B1-04	C	T	O	No	Yes	Yes				19		F	4
865	15N-59-0000	B1-04	C	C	T	No	Yes	Yes	49.43	28.85	13.2	15	C	F	4
934	15N-69-0000	B1-04	C	C	T	No	Yes	Yes				37		F	4
938	15N-69-0000	B1-04	C	D	O	No	Yes	Yes				43		K	4
1145	15N-25-0000	B1-03-E	C	D	T	No	Yes	Yes				7		FF	3
1151	15N-69-0000	B1-04	C	C	T	No	Yes	Yes				30	C	F	4
1152	15N-69-0000	B1-04	C	C	T	No	Yes	Yes				33		FF	4
1155	15N-69-0000	B1-04	C	C	T	No	Yes	Yes				53		F	4
1161	15N-42-0000	B1-03-G	C	D	T	No	Yes	Yes				54		FF	3
1176	15N-44-0000	B1-03-H	C	C	T	No	Yes	Yes				19		FF	3
1214	15N-44-0000	B1-03-H	C	D	T	No	Yes	Yes				5		F	4
1215	15N-44-0000	B1-03-H	C	W	O	No	Yes	Yes				77		F	3
1222	15N-44-0000	B1-03-H	C	C	T	No	Yes	Yes				0.5		F	2
1332	20C-19-0000	B1-07	C	C	T	No	Yes	Yes				22		F	3
1350	20C-19-0000	B1-07	C	C	T	No	Yes	Yes				16		F	3
1370	20C-3-0000	B1-05	C	C	T	No	Yes	Yes				14		FF	3
1438	20A-8 C1:2000	B1-04	C	C	T	No	Yes	Yes				18		FF	2
1453	20A-8 C1:2000	B1-04	C	C	T	No	Yes	Yes				7	C	F	3
1460	20C-3-0000	B1-05	C	C	T	No	Yes	Yes				19		F	4
1463	20C-3-0000	B1-05	C	W	T	No	Yes	Yes				73		FF	3
1466	20C-3-0000	B1-05	C	D	T	No	Yes	Yes				12		F	3
1475	20C-3-0000	B1-05	C	X	T	No	Yes	Yes				32		F	4
1488	20C-3-0000	B1-05	C	D	T	No	Yes	Yes				26		C	3
1552	20A-6-0000	B1-04	C	C	T	No	Yes	Yes				117		K	3
1553	20A-6-0000	B1-04	C	C	T	No	Yes	Yes				27	D	F	4
1571	20B-1-0000	B1-05	C	D	T	No	Yes	Yes				15		F	3
1576	20B-1-0000	B1-05	C	D	O	No	Yes	Yes				3		F	2
1664	20C-1-0000	B1-05	C	C	O	No	Yes	Yes				75		K	4
1694	20C-5-0000	B1-05	C	C	O	No	Yes	Yes				5		F	2
1697	20C-5-0000	B1-05	C	C	O	No	Yes	Yes				88		K	4
1698	20C-5-0000	B1-05	C	W	O	No	Yes	Yes				32		F	4
1723	20C-5-0000	B1-05	C	C	T	No	Yes	Yes				0.5		FF	2
1768	20A-6-0000	B1-04	C	X	O	No	Yes	Yes				10		F	3
1810	20D-9-0000	B1-08	C	C	T	No	Yes	Yes	31.11	23.29	12.55	7		FF	2
1883	20D-8-0000	B1-08	C	C	T	No	Yes	Yes				140		C	4
1898	20D-8-0000	B1-08	C	C	T	No	Yes	Yes				10		F	3
1923	20A-6-0000	B1-04	C	X	O	No	Yes	Yes				67		F	4
1954	20A-6-0000	B1-04	C	X	O	No	Yes	Yes				67		F	4
1965	15N-69-0000	B1-04	C	C	T	No	Yes	Yes				21		F	4
1969	15N-69-0000	B1-04	C	C	T	No	Yes	Yes				17		F	3
2594	20A-15-0000	B1-13	C	D	T	No	Yes	Yes	42.44	24.87	9.69	10	C	F	3
3324	15N-138-0000	B1-05	C	C	T	No	Yes	Yes				6		FF	2
3405	15N-143-0000	B1-05	C	C	T	No	Yes	Yes				14		F	3

3437	15N-137-0000	B1-05	C	C	T	No	Yes	Yes				8		FF	2
649	19D-15-0000	B1-06	C	C	T	Yes	Yes	Yes				27		F	4
682	19D-15-0000	B1-06	C	C	T	Yes	Yes	Yes				2		F	2
685	20C-19-0000	B1-07	C	X	O	Yes	Yes	Yes				45		F	4
686	20C-19-0000	B1-07	C	W	O	Yes	Yes	Yes				21		K	3
692	20C-19-0000	B1-07	C	C	T	Yes	Yes	Yes				27		F	3
693	20C-19-0000	B1-07	C	R	T	Yes	Yes	Yes	27.89	28.05	11.91	26		K	3
719	20C-19-0000	B1-07	C	R	T	Yes	Yes	Yes	28.7	24.62	5.18	3	C	FF	2
773	20C-19-0000	B1-07	C	C	T	Yes	Yes	Yes				2		FF	2
832	15N-69-0000	B1-04	C	R	T	Yes	Yes	Yes				5		FF	2
833	15N-69-0000	B1-04	C	Z	O	Yes	Yes	Yes				29		K	4
884	15N-59-0000	B1-04	C	Z	O	Yes	Yes	Yes				5		F	3
1050	15N-44-0000	B1-03-H	C	D	T	Yes	Yes	Yes	52.83	33.15	13.31	17	S	F	4
1051	15N-44-0000	B1-03-H	C	D	T	Yes	Yes	Yes				41		FF	4
1148	15N-25-0000	B1-03-E	C	W	O	Yes	Yes	Yes				27		FF	3
1165	15N-42-0000	B1-03-G	C	C	T	Yes	Yes	Yes				24		F	4
1167	15N-42-0000	B1-03-G	C	R	O	Yes	Yes	Yes				13		F	3
1168	15N-42-0000	B1-03-G	C	R	O	Yes	Yes	Yes				18		F	3
1196	15N-44-0000	B1-03-H	C	W	O	Yes	Yes	Yes				5		F	3
1205	15N-44-0000	B1-03-H	C	W	O	Yes	Yes	Yes				12		FF	2
1209	15N-44-0000	B1-03-H	C	R	O	Yes	Yes	Yes				19		FF	3
1306	15N-69-0000	B1-04	C	R	O	Yes	Yes	Yes				42		F	4
1418	20A-3 C1:2000	B1-04	C	R	T	Yes	Yes	Yes				7		F	2
1452	20A-8 C1:2000	B1-04	C	D	O	Yes	Yes	Yes				5		FF	2
1620	19D-4-1313	B1-02	C	R	O	Yes	Yes	Yes	52.39	37.65	23.69	47		B	4
1712	20C-5-0000	B1-05	C	D	T	Yes	Yes	Yes				6		F	2
1783	20A-6-0000	B1-04	C	D	T	Yes	Yes	Yes				0.5		FF	1
1841	20D-9-0000	B1-08	C	W	O	Yes	Yes	Yes	28.01	19.43	6.43	4		F	3
1862	20D-9-0000	B1-08	C	R	T	Yes	Yes	Yes				2		FF	1
1874	20D-9-0000	B1-08	C	R	O	Yes	Yes	Yes				0.5		FF	1
1912	20D-8-0000	B1-08	C	R	T	Yes	Yes	Yes				2		FF	2
1929	20A-6-0000	B1-04	C	R	T	Yes	Yes	Yes				30		F	4
1943	20D-8-0000	B1-08	C	R	T	Yes	Yes	Yes				2		FF	2
1960	20A-6-0000	B1-04	C	R	T	Yes	Yes	Yes				30		F	4
1994	15N-69-0000	B1-04	C	R	O	Yes	Yes	Yes				5		F	2
1997	15N-69-0000	B1-04	C	C	T	Yes	Yes	Yes				21		F	4
2578	20A-15-0000	B1-13	C	R	O	Yes	Yes	Yes				0.5		FF	2
3328	15N-138-0000	B1-05	C	C	T	Yes	Yes	Yes				35		F	4
3340	15N-138-0000	B1-05	C	G	O	Yes	Yes	Yes				109		FF	4
3428	15N-122-0000	B1-04	C	R	T	Yes	Yes	Yes				29		FF	4
3446	15N-137-0000	B1-05	C	R	O	Yes	Yes	Yes				6		F	3