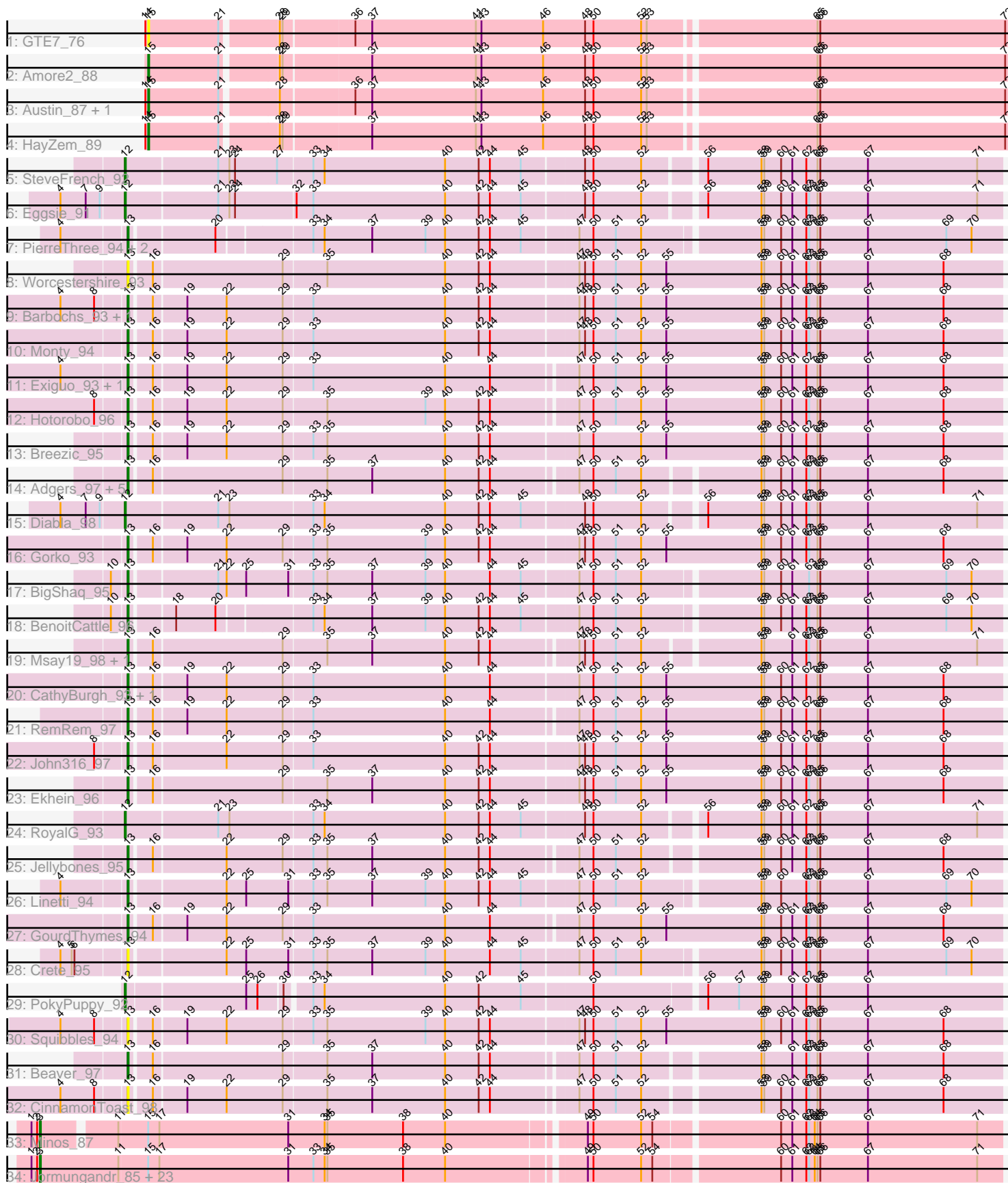


Pham 224559



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 224559 Report

This analysis was run 03/28/25 on database version 593.

Pham number 224559 has 69 members, 9 are drafts.

Phages represented in each track:

- Track 1 : GTE7\_76
- Track 2 : Amore2\_88
- Track 3 : Austin\_87, GMA7\_76
- Track 4 : HayZem\_89
- Track 5 : SteveFrench\_92
- Track 6 : Eggsie\_91
- Track 7 : PierreThree\_94, Dakiti\_96, Chelms\_94
- Track 8 : Worcestershire\_93
- Track 9 : Barbochs\_93, Flakey\_95
- Track 10 : Monty\_94
- Track 11 : Exiguo\_93, Sam12\_93
- Track 12 : Hotorobo\_96
- Track 13 : Breezic\_95
- Track 14 : Adgers\_97, BirksAndSocks\_97, FelixAlejandro\_97, Boneham\_96, Sombrero\_95, Butterball\_95
- Track 15 : Diabla\_98
- Track 16 : Gorko\_93
- Track 17 : BigShaq\_95
- Track 18 : BenoitCattle\_96
- Track 19 : Msay19\_98, Poland\_98
- Track 20 : CathyBurgh\_93, Lizzo\_94
- Track 21 : RemRem\_97
- Track 22 : John316\_97
- Track 23 : Ekhein\_96
- Track 24 : RoyalG\_93
- Track 25 : Jellybones\_95
- Track 26 : Linetti\_94
- Track 27 : GourdThymes\_94
- Track 28 : Crete\_95
- Track 29 : PokyPuppy\_92
- Track 30 : Squibbles\_94
- Track 31 : Beaver\_97
- Track 32 : CinnamonToast\_98
- Track 33 : Minos\_87
- Track 34 : Jormungandr\_85, Jams\_86, Harambe\_85, Charianelly\_86, Luker\_87, Woes\_85, Damp\_86, Shelley\_86, Nimi13\_85, Hail2Pitt\_84, Bianmat\_86, GalacticEye\_86, MrWormie\_86, Hello\_85, Neoevie\_85, Berries\_86, Sticker17\_86,

Teal\_85, Lahirium\_86, Guillaume\_85, Kaseim\_85, Newt\_87, Anamika\_85, Lidong\_86

**Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 13, it was called in 28 of the 60 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adgers\_97, Barbochs\_93, Beaver\_97, BenoitCattle\_96, BigShaq\_95, BirksAndSocks\_97, Boneham\_96, Breezic\_95, Butterball\_95, CathyBurgh\_93, Chelms\_94, CinnamonToast\_98, Crete\_95, Dakiti\_96, Ekhein\_96, Exiguo\_93, FelixAlejandro\_97, Flakey\_95, Gorko\_93, GourdThymes\_94, Hotorobo\_96, Jellybones\_95, John316\_97, Linetti\_94, Lizzo\_94, Monty\_94, Msay19\_98, PierreThree\_94, Poland\_98, RemRem\_97, Sam12\_93, Sombrero\_95, Squibbles\_94, Worcestershire\_93,

Genes that have the "Most Annotated" start but do not call it:

- 

Genes that do not have the "Most Annotated" start:

- Amore2\_88, Anamika\_85, Austin\_87, Berries\_86, Bianmat\_86, Charianelly\_86, Damp\_86, Diabla\_98, Eggsie\_91, GMA7\_76, GTE7\_76, GalacticEye\_86, Guillaume\_85, Hail2Pitt\_84, Harambe\_85, HayZem\_89, Hello\_85, Jams\_86, Jormungandr\_85, Kaseim\_85, Lahirium\_86, Lidong\_86, Luker\_87, Minos\_87, MrWormie\_86, Neoevie\_85, Newt\_87, Nimi13\_85, PokyPuppy\_92, RoyalG\_93, Shelley\_86, SteveFrench\_92, Sticker17\_86, Teal\_85, Woes\_85,

**Summary by start number:**

Start 3:

- Found in 25 of 69 ( 36.2% ) of genes in pham
- Manual Annotations of this start: 24 of 60
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Anamika\_85 (CS3), Berries\_86 (CS3), Bianmat\_86 (CS3), Charianelly\_86 (CS3), Damp\_86 (CS3), GalacticEye\_86 (CS3), Guillaume\_85 (CS3), Hail2Pitt\_84 (CS3), Harambe\_85 (CS3), Hello\_85 (CS3), Jams\_86 (CS3), Jormungandr\_85 (CS3), Kaseim\_85 (CS3), Lahirium\_86 (CS3), Lidong\_86 (CS3), Luker\_87 (CS3), Minos\_87 (CS3), MrWormie\_86 (CS3), Neoevie\_85 (CS3), Newt\_87 (CS3), Nimi13\_85 (CS3), Shelley\_86 (CS3), Sticker17\_86 (CS3), Teal\_85 (CS3), Woes\_85 (CS3),

Start 12:

- Found in 5 of 69 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 5 of 60
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Diabla\_98 (CS2), Eggsie\_91 (CS2), PokyPuppy\_92 (CS2), RoyalG\_93 (CS2), SteveFrench\_92 (CS2),

Start 13:

- Found in 34 of 69 ( 49.3% ) of genes in pham

- Manual Annotations of this start: 28 of 60
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adgers\_97 (CS2), Barbochs\_93 (CS2), Beaver\_97 (CS2), BenoitCattle\_96 (CS2), BigShaq\_95 (CS2), BirksAndSocks\_97 (CS2), Boneham\_96 (CS2), Breezic\_95 (CS2), Butterball\_95 (CS2), CathyBurgh\_93 (CS2), Chelms\_94 (CS2), CinnamonToast\_98 (CS2), Crete\_95 (CS2), Dakiti\_96 (CS2), Ekhein\_96 (CS2), Exiguo\_93 (CS2), FelixAlejandro\_97 (CS2), Flakey\_95 (CS2), Gorko\_93 (CS2), GourdThymes\_94 (CS2), Hotorobo\_96 (CS2), Jellybones\_95 (CS2), John316\_97 (CS2), Linetti\_94 (CS2), Lizzo\_94 (CS2), Monty\_94 (CS2), Msay19\_98 (CS2), PierreThree\_94 (CS2), Poland\_98 (CS2), RemRem\_97 (CS2), Sam12\_93 (CS2), Sombrero\_95 (CS2), Squibbles\_94 (CS2), Worcestershire\_93 (CS2),

Start 15:

- Found in 30 of 69 ( 43.5% ) of genes in pham
- Manual Annotations of this start: 3 of 60
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Amore2\_88 (CS1), Austin\_87 (CS1), GMA7\_76 (CS1), GTE7\_76 (CS1), HayZem\_89 (CS1),

### Summary by clusters:

There are 3 clusters represented in this pham: CS1, CS3, CS2,

Info for manual annotations of cluster CS1:

- Start number 15 was manually annotated 3 times for cluster CS1.

Info for manual annotations of cluster CS2:

- Start number 12 was manually annotated 5 times for cluster CS2.
- Start number 13 was manually annotated 28 times for cluster CS2.

Info for manual annotations of cluster CS3:

- Start number 3 was manually annotated 24 times for cluster CS3.

### Gene Information:

Gene: Adgers\_97 Start: 70250, Stop: 69354, Start Num: 13

Candidate Starts for Adgers\_97:

(Start: 13 @70250 has 28 MA's), (16, 70229), (29, 70094), (35, 70049), (37, 70001), (40, 69923), (42, 69887), (44, 69875), (47, 69791), (50, 69776), (51, 69752), (52, 69725), (58, 69611), (59, 69608), (60, 69590), (61, 69578), (62, 69563), (63, 69560), (65, 69551), (66, 69548), (67, 69497), (68, 69416),

Gene: Amore2\_88 Start: 67704, Stop: 66814, Start Num: 15

Candidate Starts for Amore2\_88:

(Start: 15 @67704 has 3 MA's), (21, 67629), (28, 67575), (29, 67572), (37, 67482), (41, 67371), (43, 67365), (46, 67299), (48, 67254), (50, 67245), (52, 67194), (53, 67188), (65, 67020), (66, 67017), (72, 66819),

Gene: Anamika\_85 Start: 68874, Stop: 67876, Start Num: 3

Candidate Starts for Anamika\_85:

(1, 68883), (2, 68877), (Start: 3 @68874 has 24 MA's), (11, 68790), (Start: 15 @68760 has 3 MA's), (17, 68748), (31, 68610), (33, 68583), (34, 68571), (35, 68568), (38, 68487), (40, 68442), (49, 68307), (50, 68301), (52, 68250), (54, 68238), (60, 68112), (61, 68100), (62, 68085), (63, 68082), (64, 68076), (65, 68073), (66, 68070), (67, 68019), (71, 67902),

Gene: Austin\_87 Start: 67702, Stop: 66812, Start Num: 15

Candidate Starts for Austin\_87:

(14, 67705), (Start: 15 @67702 has 3 MA's), (21, 67627), (28, 67573), (36, 67498), (37, 67480), (41, 67369), (43, 67363), (46, 67297), (48, 67252), (50, 67243), (52, 67192), (53, 67186), (65, 67018), (66, 67015), (72, 66817),

Gene: Barbochs\_93 Start: 69441, Stop: 68524, Start Num: 13

Candidate Starts for Barbochs\_93:

(4, 69507), (8, 69471), (Start: 13 @69441 has 28 MA's), (16, 69420), (19, 69387), (22, 69345), (29, 69285), (33, 69255), (40, 69114), (42, 69078), (44, 69066), (47, 68976), (48, 68970), (50, 68961), (51, 68937), (52, 68910), (55, 68883), (58, 68781), (59, 68778), (60, 68760), (61, 68748), (62, 68733), (63, 68730), (65, 68721), (66, 68718), (67, 68667), (68, 68586),

Gene: Beaver\_97 Start: 71591, Stop: 70695, Start Num: 13

Candidate Starts for Beaver\_97:

(Start: 13 @71591 has 28 MA's), (16, 71570), (29, 71435), (35, 71390), (37, 71342), (40, 71264), (42, 71228), (44, 71216), (47, 71132), (50, 71117), (51, 71093), (52, 71066), (58, 70952), (59, 70949), (61, 70919), (62, 70904), (63, 70901), (65, 70892), (66, 70889), (67, 70838), (68, 70757),

Gene: BenoitCattle\_96 Start: 70989, Stop: 70093, Start Num: 13

Candidate Starts for BenoitCattle\_96:

(10, 71004), (Start: 13 @70989 has 28 MA's), (18, 70947), (20, 70905), (33, 70812), (34, 70800), (37, 70749), (39, 70692), (40, 70671), (42, 70635), (44, 70623), (45, 70590), (47, 70533), (50, 70518), (51, 70494), (52, 70467), (58, 70350), (59, 70347), (60, 70329), (61, 70317), (62, 70302), (63, 70299), (65, 70290), (66, 70287), (67, 70236), (69, 70152), (70, 70125),

Gene: Berries\_86 Start: 68846, Stop: 67848, Start Num: 3

Candidate Starts for Berries\_86:

(1, 68855), (2, 68849), (Start: 3 @68846 has 24 MA's), (11, 68762), (Start: 15 @68732 has 3 MA's), (17, 68720), (31, 68582), (33, 68555), (34, 68543), (35, 68540), (38, 68459), (40, 68414), (49, 68279), (50, 68273), (52, 68222), (54, 68210), (60, 68084), (61, 68072), (62, 68057), (63, 68054), (64, 68048), (65, 68045), (66, 68042), (67, 67991), (71, 67874),

Gene: Bianmat\_86 Start: 68886, Stop: 67888, Start Num: 3

Candidate Starts for Bianmat\_86:

(1, 68895), (2, 68889), (Start: 3 @68886 has 24 MA's), (11, 68802), (Start: 15 @68772 has 3 MA's), (17, 68760), (31, 68622), (33, 68595), (34, 68583), (35, 68580), (38, 68499), (40, 68454), (49, 68319), (50, 68313), (52, 68262), (54, 68250), (60, 68124), (61, 68112), (62, 68097), (63, 68094), (64, 68088), (65, 68085), (66, 68082), (67, 68031), (71, 67914),

Gene: BigShaq\_95 Start: 70588, Stop: 69683, Start Num: 13

Candidate Starts for BigShaq\_95:

(10, 70603), (Start: 13 @70588 has 28 MA's), (21, 70501), (22, 70492), (25, 70471), (31, 70426), (33, 70402), (35, 70387), (37, 70339), (39, 70282), (40, 70261), (44, 70213), (45, 70180), (47, 70123), (50, 70108), (51, 70084), (52, 70057), (58, 69940), (59, 69937), (60, 69919), (61, 69907), (63, 69889), (65, 69880), (66, 69877), (67, 69826), (69, 69742), (70, 69715),

Gene: BirksAndSocks\_97 Start: 71205, Stop: 70309, Start Num: 13

Candidate Starts for BirksAndSocks\_97:

(Start: 13 @71205 has 28 MA's), (16, 71184), (29, 71049), (35, 71004), (37, 70956), (40, 70878), (42, 70842), (44, 70830), (47, 70746), (50, 70731), (51, 70707), (52, 70680), (58, 70566), (59, 70563), (60, 70545), (61, 70533), (62, 70518), (63, 70515), (65, 70506), (66, 70503), (67, 70452), (68, 70371),

Gene: Boneham\_96 Start: 71130, Stop: 70234, Start Num: 13

Candidate Starts for Boneham\_96:

(Start: 13 @71130 has 28 MA's), (16, 71109), (29, 70974), (35, 70929), (37, 70881), (40, 70803), (42, 70767), (44, 70755), (47, 70671), (50, 70656), (51, 70632), (52, 70605), (58, 70491), (59, 70488), (60, 70470), (61, 70458), (62, 70443), (63, 70440), (65, 70431), (66, 70428), (67, 70377), (68, 70296),

Gene: Breezic\_95 Start: 70142, Stop: 69225, Start Num: 13

Candidate Starts for Breezic\_95:

(Start: 13 @70142 has 28 MA's), (16, 70121), (19, 70088), (22, 70046), (29, 69986), (33, 69956), (35, 69941), (40, 69815), (42, 69779), (44, 69767), (47, 69677), (50, 69662), (52, 69611), (55, 69584), (58, 69482), (59, 69479), (60, 69461), (61, 69449), (62, 69434), (65, 69422), (66, 69419), (67, 69368), (68, 69287),

Gene: Butterball\_95 Start: 71135, Stop: 70239, Start Num: 13

Candidate Starts for Butterball\_95:

(Start: 13 @71135 has 28 MA's), (16, 71114), (29, 70979), (35, 70934), (37, 70886), (40, 70808), (42, 70772), (44, 70760), (47, 70676), (50, 70661), (51, 70637), (52, 70610), (58, 70496), (59, 70493), (60, 70475), (61, 70463), (62, 70448), (63, 70445), (65, 70436), (66, 70433), (67, 70382), (68, 70301),

Gene: CathyBurgh\_93 Start: 70172, Stop: 69255, Start Num: 13

Candidate Starts for CathyBurgh\_93:

(Start: 13 @70172 has 28 MA's), (16, 70151), (19, 70118), (22, 70076), (29, 70016), (33, 69986), (40, 69845), (44, 69797), (47, 69707), (50, 69692), (51, 69668), (52, 69641), (55, 69614), (58, 69512), (59, 69509), (60, 69491), (61, 69479), (62, 69464), (65, 69452), (66, 69449), (67, 69398), (68, 69317),

Gene: Charianelly\_86 Start: 68596, Stop: 67598, Start Num: 3

Candidate Starts for Charianelly\_86:

(1, 68605), (2, 68599), (Start: 3 @68596 has 24 MA's), (11, 68512), (Start: 15 @68482 has 3 MA's), (17, 68470), (31, 68332), (33, 68305), (34, 68293), (35, 68290), (38, 68209), (40, 68164), (49, 68029), (50, 68023), (52, 67972), (54, 67960), (60, 67834), (61, 67822), (62, 67807), (63, 67804), (64, 67798), (65, 67795), (66, 67792), (67, 67741), (71, 67624),

Gene: Chelms\_94 Start: 70726, Stop: 69830, Start Num: 13

Candidate Starts for Chelms\_94:

(4, 70792), (Start: 13 @70726 has 28 MA's), (20, 70642), (33, 70549), (34, 70537), (37, 70486), (39, 70429), (40, 70408), (42, 70372), (44, 70360), (45, 70327), (47, 70270), (50, 70255), (51, 70231), (52, 70204), (58, 70087), (59, 70084), (60, 70066), (61, 70054), (62, 70039), (63, 70036), (65, 70027), (66, 70024), (67, 69973), (69, 69889), (70, 69862),

Gene: CinnamonToast\_98 Start: 71698, Stop: 70802, Start Num: 13

Candidate Starts for CinnamonToast\_98:

(4, 71764), (8, 71728), (Start: 13 @71698 has 28 MA's), (16, 71677), (19, 71644), (22, 71602), (29, 71542), (35, 71497), (37, 71449), (40, 71371), (42, 71335), (44, 71323), (47, 71239), (50, 71224), (51, 71200), (52, 71173), (58, 71059), (59, 71056), (60, 71038), (61, 71026), (62, 71011), (63, 71008), (65, 70999), (66, 70996), (67, 70945), (68, 70864),

Gene: Crete\_95 Start: 70771, Stop: 69866, Start Num: 13

Candidate Starts for Crete\_95:

(4, 70837), (5, 70825), (6, 70822), (Start: 13 @70771 has 28 MA's), (22, 70675), (25, 70654), (31, 70609), (33, 70585), (35, 70570), (37, 70522), (39, 70465), (40, 70444), (44, 70396), (45, 70363), (47, 70306), (50, 70291), (51, 70267), (52, 70240), (58, 70123), (59, 70120), (60, 70102), (61, 70090), (62, 70075), (63, 70072), (65, 70063), (66, 70060), (67, 70009), (69, 69925), (70, 69898),

Gene: Dakiti\_96 Start: 71669, Stop: 70773, Start Num: 13

Candidate Starts for Dakiti\_96:

(4, 71735), (Start: 13 @71669 has 28 MA's), (20, 71585), (33, 71492), (34, 71480), (37, 71429), (39, 71372), (40, 71351), (42, 71315), (44, 71303), (45, 71270), (47, 71213), (50, 71198), (51, 71174), (52, 71147), (58, 71030), (59, 71027), (60, 71009), (61, 70997), (62, 70982), (63, 70979), (65, 70970), (66, 70967), (67, 70916), (69, 70832), (70, 70805),

Gene: Damp\_86 Start: 67760, Stop: 66762, Start Num: 3

Candidate Starts for Damp\_86:

(1, 67769), (2, 67763), (Start: 3 @67760 has 24 MA's), (11, 67676), (Start: 15 @67646 has 3 MA's), (17, 67634), (31, 67496), (33, 67469), (34, 67457), (35, 67454), (38, 67373), (40, 67328), (49, 67193), (50, 67187), (52, 67136), (54, 67124), (60, 66998), (61, 66986), (62, 66971), (63, 66968), (64, 66962), (65, 66959), (66, 66956), (67, 66905), (71, 66788),

Gene: Diabla\_98 Start: 71134, Stop: 70223, Start Num: 12

Candidate Starts for Diabla\_98:

(4, 71200), (7, 71173), (9, 71158), (Start: 12 @71134 has 5 MA's), (21, 71038), (23, 71026), (33, 70939), (34, 70927), (40, 70798), (42, 70762), (44, 70750), (45, 70717), (48, 70654), (50, 70645), (52, 70594), (56, 70537), (58, 70480), (59, 70477), (60, 70459), (61, 70447), (62, 70432), (63, 70429), (65, 70420), (66, 70417), (67, 70366), (71, 70249),

Gene: Eggsie\_91 Start: 68690, Stop: 67779, Start Num: 12

Candidate Starts for Eggsie\_91:

(4, 68756), (7, 68729), (9, 68714), (Start: 12 @68690 has 5 MA's), (21, 68594), (23, 68582), (24, 68576), (32, 68513), (33, 68495), (40, 68354), (42, 68318), (44, 68306), (45, 68273), (48, 68210), (50, 68201), (52, 68150), (56, 68093), (58, 68036), (59, 68033), (60, 68015), (61, 68003), (62, 67988), (63, 67985), (65, 67976), (66, 67973), (67, 67922), (71, 67805),

Gene: Ekhein\_96 Start: 70186, Stop: 69269, Start Num: 13

Candidate Starts for Ekhein\_96:

(Start: 13 @70186 has 28 MA's), (16, 70165), (29, 70030), (35, 69985), (37, 69937), (40, 69859), (42, 69823), (44, 69811), (47, 69721), (48, 69715), (50, 69706), (51, 69682), (52, 69655), (55, 69628), (58, 69526), (59, 69523), (60, 69505), (61, 69493), (62, 69478), (63, 69475), (65, 69466), (66, 69463), (67, 69412), (68, 69331),

Gene: Exiguo\_93 Start: 69605, Stop: 68694, Start Num: 13

Candidate Starts for Exiguo\_93:

(4, 69671), (Start: 13 @69605 has 28 MA's), (16, 69584), (19, 69551), (22, 69509), (29, 69449), (33, 69419), (40, 69278), (44, 69230), (47, 69146), (50, 69131), (51, 69107), (52, 69080), (55, 69053), (58, 68951), (59, 68948), (60, 68930), (61, 68918), (62, 68903), (65, 68891), (66, 68888), (67, 68837), (68, 68756),

Gene: FelixAlejandro\_97 Start: 71648, Stop: 70752, Start Num: 13

Candidate Starts for FelixAlejandro\_97:

(Start: 13 @71648 has 28 MA's), (16, 71627), (29, 71492), (35, 71447), (37, 71399), (40, 71321), (42, 71285), (44, 71273), (47, 71189), (50, 71174), (51, 71150), (52, 71123), (58, 71009), (59, 71006), (60, 70988), (61, 70976), (62, 70961), (63, 70958), (65, 70949), (66, 70946), (67, 70895), (68, 70814),

Gene: Flakey\_95 Start: 71083, Stop: 70166, Start Num: 13

Candidate Starts for Flakey\_95:

(4, 71149), (8, 71113), (Start: 13 @71083 has 28 MA's), (16, 71062), (19, 71029), (22, 70987), (29, 70927), (33, 70897), (40, 70756), (42, 70720), (44, 70708), (47, 70618), (48, 70612), (50, 70603), (51, 70579), (52, 70552), (55, 70525), (58, 70423), (59, 70420), (60, 70402), (61, 70390), (62, 70375), (63, 70372), (65, 70363), (66, 70360), (67, 70309), (68, 70228),

Gene: GMA7\_76 Start: 61589, Stop: 60699, Start Num: 15

Candidate Starts for GMA7\_76:

(14, 61592), (Start: 15 @61589 has 3 MA's), (21, 61514), (28, 61460), (36, 61385), (37, 61367), (41, 61256), (43, 61250), (46, 61184), (48, 61139), (50, 61130), (52, 61079), (53, 61073), (65, 60905), (66, 60902), (72, 60704),

Gene: GTE7\_76 Start: 62155, Stop: 61265, Start Num: 15

Candidate Starts for GTE7\_76:

(14, 62158), (Start: 15 @62155 has 3 MA's), (21, 62080), (28, 62026), (29, 62023), (36, 61951), (37, 61933), (41, 61822), (43, 61816), (46, 61750), (48, 61705), (50, 61696), (52, 61645), (53, 61639), (65, 61471), (66, 61468), (72, 61270),

Gene: GalacticEye\_86 Start: 68554, Stop: 67556, Start Num: 3

Candidate Starts for GalacticEye\_86:

(1, 68563), (2, 68557), (Start: 3 @68554 has 24 MA's), (11, 68470), (Start: 15 @68440 has 3 MA's), (17, 68428), (31, 68290), (33, 68263), (34, 68251), (35, 68248), (38, 68167), (40, 68122), (49, 67987), (50, 67981), (52, 67930), (54, 67918), (60, 67792), (61, 67780), (62, 67765), (63, 67762), (64, 67756), (65, 67753), (66, 67750), (67, 67699), (71, 67582),

Gene: Gorko\_93 Start: 69355, Stop: 68438, Start Num: 13

Candidate Starts for Gorko\_93:

(Start: 13 @69355 has 28 MA's), (16, 69334), (19, 69301), (22, 69259), (29, 69199), (33, 69169), (35, 69154), (39, 69049), (40, 69028), (42, 68992), (44, 68980), (47, 68890), (48, 68884), (50, 68875), (51, 68851), (52, 68824), (55, 68797), (58, 68695), (59, 68692), (60, 68674), (61, 68662), (62, 68647), (63, 68644), (65, 68635), (66, 68632), (67, 68581), (68, 68500),

Gene: GourdThymes\_94 Start: 70193, Stop: 69282, Start Num: 13

Candidate Starts for GourdThymes\_94:

(Start: 13 @70193 has 28 MA's), (16, 70172), (19, 70139), (22, 70097), (29, 70037), (33, 70007), (40, 69866), (44, 69818), (47, 69734), (50, 69719), (52, 69668), (55, 69641), (58, 69539), (59, 69536), (60, 69518), (61, 69506), (62, 69491), (63, 69488), (65, 69479), (66, 69476), (67, 69425), (68, 69344),

Gene: Guillaume\_85 Start: 68607, Stop: 67609, Start Num: 3

Candidate Starts for Guillaume\_85:

(1, 68616), (2, 68610), (Start: 3 @68607 has 24 MA's), (11, 68523), (Start: 15 @68493 has 3 MA's), (17, 68481), (31, 68343), (33, 68316), (34, 68304), (35, 68301), (38, 68220), (40, 68175), (49, 68040), (50, 68034), (52, 67983), (54, 67971), (60, 67845), (61, 67833), (62, 67818), (63, 67815), (64, 67809), (65, 67806), (66, 67803), (67, 67752), (71, 67635),

Gene: Hail2Pitt\_84 Start: 69080, Stop: 68082, Start Num: 3

Candidate Starts for Hail2Pitt\_84:

(1, 69089), (2, 69083), (Start: 3 @69080 has 24 MA's), (11, 68996), (Start: 15 @68966 has 3 MA's), (17, 68954), (31, 68816), (33, 68789), (34, 68777), (35, 68774), (38, 68693), (40, 68648), (49, 68513), (50, 68507), (52, 68456), (54, 68444), (60, 68318), (61, 68306), (62, 68291), (63, 68288), (64, 68282), (65, 68279), (66, 68276), (67, 68225), (71, 68108),



Gene: Harambe\_85 Start: 68874, Stop: 67876, Start Num: 3

Candidate Starts for Harambe\_85:

(1, 68883), (2, 68877), (Start: 3 @68874 has 24 MA's), (11, 68790), (Start: 15 @68760 has 3 MA's), (17, 68748), (31, 68610), (33, 68583), (34, 68571), (35, 68568), (38, 68487), (40, 68442), (49, 68307), (50, 68301), (52, 68250), (54, 68238), (60, 68112), (61, 68100), (62, 68085), (63, 68082), (64, 68076), (65, 68073), (66, 68070), (67, 68019), (71, 67902),

Gene: HayZem\_89 Start: 67702, Stop: 66812, Start Num: 15

Candidate Starts for HayZem\_89:

(14, 67705), (Start: 15 @67702 has 3 MA's), (21, 67627), (28, 67573), (29, 67570), (37, 67480), (41, 67369), (43, 67363), (46, 67297), (48, 67252), (50, 67243), (52, 67192), (53, 67186), (65, 67018), (66, 67015), (72, 66817),

Gene: Hello\_85 Start: 68836, Stop: 67838, Start Num: 3

Candidate Starts for Hello\_85:

(1, 68845), (2, 68839), (Start: 3 @68836 has 24 MA's), (11, 68752), (Start: 15 @68722 has 3 MA's), (17, 68710), (31, 68572), (33, 68545), (34, 68533), (35, 68530), (38, 68449), (40, 68404), (49, 68269), (50, 68263), (52, 68212), (54, 68200), (60, 68074), (61, 68062), (62, 68047), (63, 68044), (64, 68038), (65, 68035), (66, 68032), (67, 67981), (71, 67864),

Gene: Hotorobo\_96 Start: 71054, Stop: 70143, Start Num: 13

Candidate Starts for Hotorobo\_96:

(8, 71084), (Start: 13 @71054 has 28 MA's), (16, 71033), (19, 71000), (22, 70958), (29, 70898), (35, 70853), (39, 70748), (40, 70727), (42, 70691), (44, 70679), (47, 70595), (50, 70580), (51, 70556), (52, 70529), (55, 70502), (58, 70400), (59, 70397), (60, 70379), (61, 70367), (62, 70352), (63, 70349), (65, 70340), (66, 70337), (67, 70286), (68, 70205),

Gene: Jams\_86 Start: 67884, Stop: 66886, Start Num: 3

Candidate Starts for Jams\_86:

(1, 67893), (2, 67887), (Start: 3 @67884 has 24 MA's), (11, 67800), (Start: 15 @67770 has 3 MA's), (17, 67758), (31, 67620), (33, 67593), (34, 67581), (35, 67578), (38, 67497), (40, 67452), (49, 67317), (50, 67311), (52, 67260), (54, 67248), (60, 67122), (61, 67110), (62, 67095), (63, 67092), (64, 67086), (65, 67083), (66, 67080), (67, 67029), (71, 66912),

Gene: Jellybones\_95 Start: 71336, Stop: 70440, Start Num: 13

Candidate Starts for Jellybones\_95:

(Start: 13 @71336 has 28 MA's), (16, 71315), (22, 71240), (29, 71180), (33, 71150), (35, 71135), (37, 71087), (40, 71009), (42, 70973), (44, 70961), (47, 70877), (50, 70862), (51, 70838), (52, 70811), (58, 70697), (59, 70694), (60, 70676), (61, 70664), (62, 70649), (63, 70646), (65, 70637), (66, 70634), (67, 70583), (68, 70502),

Gene: John316\_97 Start: 71313, Stop: 70396, Start Num: 13

Candidate Starts for John316\_97:

(8, 71343), (Start: 13 @71313 has 28 MA's), (16, 71292), (22, 71217), (29, 71157), (33, 71127), (40, 70986), (42, 70950), (44, 70938), (47, 70848), (48, 70842), (50, 70833), (51, 70809), (52, 70782), (55, 70755), (58, 70653), (59, 70650), (60, 70632), (61, 70620), (62, 70605), (65, 70593), (66, 70590), (67, 70539), (68, 70458),

Gene: Jormungandr\_85 Start: 68589, Stop: 67591, Start Num: 3

Candidate Starts for Jormungandr\_85:

(1, 68598), (2, 68592), (Start: 3 @68589 has 24 MA's), (11, 68505), (Start: 15 @68475 has 3 MA's), (17, 68463), (31, 68325), (33, 68298), (34, 68286), (35, 68283), (38, 68202), (40, 68157), (49, 68022), (50, 68016), (52, 67965), (54, 67953), (60, 67827), (61, 67815), (62, 67800), (63, 67797), (64, 67791),

(65, 67788), (66, 67785), (67, 67734), (71, 67617),

Gene: Kaseim\_85 Start: 68031, Stop: 67033, Start Num: 3

Candidate Starts for Kaseim\_85:

(1, 68040), (2, 68034), (Start: 3 @68031 has 24 MA's), (11, 67947), (Start: 15 @67917 has 3 MA's), (17, 67905), (31, 67767), (33, 67740), (34, 67728), (35, 67725), (38, 67644), (40, 67599), (49, 67464), (50, 67458), (52, 67407), (54, 67395), (60, 67269), (61, 67257), (62, 67242), (63, 67239), (64, 67233), (65, 67230), (66, 67227), (67, 67176), (71, 67059),

Gene: Lahirium\_86 Start: 69625, Stop: 68627, Start Num: 3

Candidate Starts for Lahirium\_86:

(1, 69634), (2, 69628), (Start: 3 @69625 has 24 MA's), (11, 69541), (Start: 15 @69511 has 3 MA's), (17, 69499), (31, 69361), (33, 69334), (34, 69322), (35, 69319), (38, 69238), (40, 69193), (49, 69058), (50, 69052), (52, 69001), (54, 68989), (60, 68863), (61, 68851), (62, 68836), (63, 68833), (64, 68827), (65, 68824), (66, 68821), (67, 68770), (71, 68653),

Gene: Lidong\_86 Start: 68846, Stop: 67848, Start Num: 3

Candidate Starts for Lidong\_86:

(1, 68855), (2, 68849), (Start: 3 @68846 has 24 MA's), (11, 68762), (Start: 15 @68732 has 3 MA's), (17, 68720), (31, 68582), (33, 68555), (34, 68543), (35, 68540), (38, 68459), (40, 68414), (49, 68279), (50, 68273), (52, 68222), (54, 68210), (60, 68084), (61, 68072), (62, 68057), (63, 68054), (64, 68048), (65, 68045), (66, 68042), (67, 67991), (71, 67874),

Gene: Linetti\_94 Start: 71695, Stop: 70790, Start Num: 13

Candidate Starts for Linetti\_94:

(4, 71761), (Start: 13 @71695 has 28 MA's), (22, 71599), (25, 71578), (31, 71533), (33, 71509), (35, 71494), (37, 71446), (39, 71389), (40, 71368), (42, 71332), (44, 71320), (45, 71287), (47, 71230), (50, 71215), (51, 71191), (52, 71164), (58, 71047), (59, 71044), (60, 71026), (62, 70999), (63, 70996), (65, 70987), (66, 70984), (67, 70933), (69, 70849), (70, 70822),

Gene: Lizzo\_94 Start: 70172, Stop: 69255, Start Num: 13

Candidate Starts for Lizzo\_94:

(Start: 13 @70172 has 28 MA's), (16, 70151), (19, 70118), (22, 70076), (29, 70016), (33, 69986), (40, 69845), (44, 69797), (47, 69707), (50, 69692), (51, 69668), (52, 69641), (55, 69614), (58, 69512), (59, 69509), (60, 69491), (61, 69479), (62, 69464), (65, 69452), (66, 69449), (67, 69398), (68, 69317),

Gene: Luker\_87 Start: 68899, Stop: 67901, Start Num: 3

Candidate Starts for Luker\_87:

(1, 68908), (2, 68902), (Start: 3 @68899 has 24 MA's), (11, 68815), (Start: 15 @68785 has 3 MA's), (17, 68773), (31, 68635), (33, 68608), (34, 68596), (35, 68593), (38, 68512), (40, 68467), (49, 68332), (50, 68326), (52, 68275), (54, 68263), (60, 68137), (61, 68125), (62, 68110), (63, 68107), (64, 68101), (65, 68098), (66, 68095), (67, 68044), (71, 67927),

Gene: Minos\_87 Start: 68573, Stop: 67587, Start Num: 3

Candidate Starts for Minos\_87:

(1, 68582), (2, 68576), (Start: 3 @68573 has 24 MA's), (11, 68501), (Start: 15 @68471 has 3 MA's), (17, 68459), (31, 68321), (34, 68282), (35, 68279), (38, 68198), (40, 68153), (49, 68018), (50, 68012), (52, 67961), (54, 67949), (60, 67823), (61, 67811), (62, 67796), (63, 67793), (64, 67787), (65, 67784), (66, 67781), (67, 67730), (71, 67613),

Gene: Monty\_94 Start: 69874, Stop: 68957, Start Num: 13

Candidate Starts for Monty\_94:

(Start: 13 @69874 has 28 MA's), (16, 69853), (19, 69820), (22, 69778), (29, 69718), (33, 69688), (40, 69547), (42, 69511), (44, 69499), (47, 69409), (48, 69403), (50, 69394), (51, 69370), (52, 69343), (55, 69316), (58, 69214), (59, 69211), (60, 69193), (61, 69181), (62, 69166), (63, 69163), (65, 69154), (66, 69151), (67, 69100), (68, 69019),

Gene: MrWormie\_86 Start: 67587, Stop: 66589, Start Num: 3

Candidate Starts for MrWormie\_86:

(1, 67596), (2, 67590), (Start: 3 @67587 has 24 MA's), (11, 67503), (Start: 15 @67473 has 3 MA's), (17, 67461), (31, 67323), (33, 67296), (34, 67284), (35, 67281), (38, 67200), (40, 67155), (49, 67020), (50, 67014), (52, 66963), (54, 66951), (60, 66825), (61, 66813), (62, 66798), (63, 66795), (64, 66789), (65, 66786), (66, 66783), (67, 66732), (71, 66615),

Gene: Msay19\_98 Start: 71931, Stop: 71035, Start Num: 13

Candidate Starts for Msay19\_98:

(Start: 13 @71931 has 28 MA's), (16, 71910), (29, 71775), (35, 71730), (37, 71682), (40, 71604), (42, 71568), (44, 71556), (47, 71472), (48, 71466), (50, 71457), (51, 71433), (52, 71406), (58, 71292), (59, 71289), (61, 71259), (62, 71244), (63, 71241), (65, 71232), (66, 71229), (67, 71178), (71, 71061),

Gene: Neoevie\_85 Start: 68847, Stop: 67849, Start Num: 3

Candidate Starts for Neoevie\_85:

(1, 68856), (2, 68850), (Start: 3 @68847 has 24 MA's), (11, 68763), (Start: 15 @68733 has 3 MA's), (17, 68721), (31, 68583), (33, 68556), (34, 68544), (35, 68541), (38, 68460), (40, 68415), (49, 68280), (50, 68274), (52, 68223), (54, 68211), (60, 68085), (61, 68073), (62, 68058), (63, 68055), (64, 68049), (65, 68046), (66, 68043), (67, 67992), (71, 67875),

Gene: Newt\_87 Start: 68916, Stop: 67918, Start Num: 3

Candidate Starts for Newt\_87:

(1, 68925), (2, 68919), (Start: 3 @68916 has 24 MA's), (11, 68832), (Start: 15 @68802 has 3 MA's), (17, 68790), (31, 68652), (33, 68625), (34, 68613), (35, 68610), (38, 68529), (40, 68484), (49, 68349), (50, 68343), (52, 68292), (54, 68280), (60, 68154), (61, 68142), (62, 68127), (63, 68124), (64, 68118), (65, 68115), (66, 68112), (67, 68061), (71, 67944),

Gene: Nimi13\_85 Start: 68597, Stop: 67599, Start Num: 3

Candidate Starts for Nimi13\_85:

(1, 68606), (2, 68600), (Start: 3 @68597 has 24 MA's), (11, 68513), (Start: 15 @68483 has 3 MA's), (17, 68471), (31, 68333), (33, 68306), (34, 68294), (35, 68291), (38, 68210), (40, 68165), (49, 68030), (50, 68024), (52, 67973), (54, 67961), (60, 67835), (61, 67823), (62, 67808), (63, 67805), (64, 67799), (65, 67796), (66, 67793), (67, 67742), (71, 67625),

Gene: PierreThree\_94 Start: 71300, Stop: 70404, Start Num: 13

Candidate Starts for PierreThree\_94:

(4, 71366), (Start: 13 @71300 has 28 MA's), (20, 71216), (33, 71123), (34, 71111), (37, 71060), (39, 71003), (40, 70982), (42, 70946), (44, 70934), (45, 70901), (47, 70844), (50, 70829), (51, 70805), (52, 70778), (58, 70661), (59, 70658), (60, 70640), (61, 70628), (62, 70613), (63, 70610), (65, 70601), (66, 70598), (67, 70547), (69, 70463), (70, 70436),

Gene: PokyPuppy\_92 Start: 70572, Stop: 69670, Start Num: 12

Candidate Starts for PokyPuppy\_92:

(Start: 12 @70572 has 5 MA's), (25, 70449), (26, 70437), (30, 70413), (33, 70389), (34, 70377), (40, 70248), (42, 70212), (45, 70167), (50, 70095), (56, 69984), (57, 69951), (58, 69927), (59, 69924), (61, 69894), (62, 69879), (65, 69867), (66, 69864), (67, 69813),

Gene: Poland\_98 Start: 71913, Stop: 71017, Start Num: 13

Candidate Starts for Poland\_98:

(Start: 13 @71913 has 28 MA's), (16, 71892), (29, 71757), (35, 71712), (37, 71664), (40, 71586), (42, 71550), (44, 71538), (47, 71454), (48, 71448), (50, 71439), (51, 71415), (52, 71388), (58, 71274), (59, 71271), (61, 71241), (62, 71226), (63, 71223), (65, 71214), (66, 71211), (67, 71160), (71, 71043),

Gene: RemRem\_97 Start: 70163, Stop: 69252, Start Num: 13

Candidate Starts for RemRem\_97:

(Start: 13 @70163 has 28 MA's), (16, 70142), (19, 70109), (22, 70067), (29, 70007), (33, 69977), (40, 69836), (44, 69788), (47, 69704), (50, 69689), (51, 69665), (52, 69638), (55, 69611), (58, 69509), (59, 69506), (60, 69488), (61, 69476), (62, 69461), (65, 69449), (66, 69446), (67, 69395), (68, 69314),

Gene: RoyalG\_93 Start: 69881, Stop: 68970, Start Num: 12

Candidate Starts for RoyalG\_93:

(Start: 12 @69881 has 5 MA's), (21, 69785), (23, 69773), (33, 69686), (34, 69674), (40, 69545), (42, 69509), (44, 69497), (45, 69464), (48, 69401), (50, 69392), (52, 69341), (56, 69284), (58, 69227), (59, 69224), (60, 69206), (61, 69194), (62, 69179), (65, 69167), (66, 69164), (67, 69113), (71, 68996),

Gene: Sam12\_93 Start: 69602, Stop: 68691, Start Num: 13

Candidate Starts for Sam12\_93:

(4, 69668), (Start: 13 @69602 has 28 MA's), (16, 69581), (19, 69548), (22, 69506), (29, 69446), (33, 69416), (40, 69275), (44, 69227), (47, 69143), (50, 69128), (51, 69104), (52, 69077), (55, 69050), (58, 68948), (59, 68945), (60, 68927), (61, 68915), (62, 68900), (65, 68888), (66, 68885), (67, 68834), (68, 68753),

Gene: Shelley\_86 Start: 68073, Stop: 67075, Start Num: 3

Candidate Starts for Shelley\_86:

(1, 68082), (2, 68076), (Start: 3 @68073 has 24 MA's), (11, 67989), (Start: 15 @67959 has 3 MA's), (17, 67947), (31, 67809), (33, 67782), (34, 67770), (35, 67767), (38, 67686), (40, 67641), (49, 67506), (50, 67500), (52, 67449), (54, 67437), (60, 67311), (61, 67299), (62, 67284), (63, 67281), (64, 67275), (65, 67272), (66, 67269), (67, 67218), (71, 67101),

Gene: Sombrero\_95 Start: 70215, Stop: 69319, Start Num: 13

Candidate Starts for Sombrero\_95:

(Start: 13 @70215 has 28 MA's), (16, 70194), (29, 70059), (35, 70014), (37, 69966), (40, 69888), (42, 69852), (44, 69840), (47, 69756), (50, 69741), (51, 69717), (52, 69690), (58, 69576), (59, 69573), (60, 69555), (61, 69543), (62, 69528), (63, 69525), (65, 69516), (66, 69513), (67, 69462), (68, 69381),

Gene: Squibbles\_94 Start: 70689, Stop: 69772, Start Num: 13

Candidate Starts for Squibbles\_94:

(4, 70755), (8, 70719), (Start: 13 @70689 has 28 MA's), (16, 70668), (19, 70635), (22, 70593), (29, 70533), (33, 70503), (35, 70488), (39, 70383), (40, 70362), (42, 70326), (44, 70314), (47, 70224), (48, 70218), (50, 70209), (51, 70185), (52, 70158), (55, 70131), (58, 70029), (59, 70026), (60, 70008), (61, 69996), (62, 69981), (63, 69978), (65, 69969), (66, 69966), (67, 69915), (68, 69834),

Gene: SteveFrench\_92 Start: 70121, Stop: 69210, Start Num: 12

Candidate Starts for SteveFrench\_92:

(Start: 12 @70121 has 5 MA's), (21, 70025), (23, 70013), (24, 70007), (27, 69962), (33, 69926), (34, 69914), (40, 69785), (42, 69749), (44, 69737), (45, 69704), (48, 69641), (50, 69632), (52, 69581), (56, 69524), (58, 69467), (59, 69464), (60, 69446), (61, 69434), (62, 69419), (65, 69407), (66, 69404), (67, 69353), (71, 69236),

Gene: Sticker17\_86 Start: 68561, Stop: 67563, Start Num: 3

Candidate Starts for Sticker17\_86:

(1, 68570), (2, 68564), (Start: 3 @68561 has 24 MA's), (11, 68477), (Start: 15 @68447 has 3 MA's), (17, 68435), (31, 68297), (33, 68270), (34, 68258), (35, 68255), (38, 68174), (40, 68129), (49, 67994), (50, 67988), (52, 67937), (54, 67925), (60, 67799), (61, 67787), (62, 67772), (63, 67769), (64, 67763), (65, 67760), (66, 67757), (67, 67706), (71, 67589),

Gene: Teal\_85 Start: 69052, Stop: 68054, Start Num: 3

Candidate Starts for Teal\_85:

(1, 69061), (2, 69055), (Start: 3 @69052 has 24 MA's), (11, 68968), (Start: 15 @68938 has 3 MA's), (17, 68926), (31, 68788), (33, 68761), (34, 68749), (35, 68746), (38, 68665), (40, 68620), (49, 68485), (50, 68479), (52, 68428), (54, 68416), (60, 68290), (61, 68278), (62, 68263), (63, 68260), (64, 68254), (65, 68251), (66, 68248), (67, 68197), (71, 68080),

Gene: Woes\_85 Start: 69103, Stop: 68105, Start Num: 3

Candidate Starts for Woes\_85:

(1, 69112), (2, 69106), (Start: 3 @69103 has 24 MA's), (11, 69019), (Start: 15 @68989 has 3 MA's), (17, 68977), (31, 68839), (33, 68812), (34, 68800), (35, 68797), (38, 68716), (40, 68671), (49, 68536), (50, 68530), (52, 68479), (54, 68467), (60, 68341), (61, 68329), (62, 68314), (63, 68311), (64, 68305), (65, 68302), (66, 68299), (67, 68248), (71, 68131),

Gene: Worcestershire\_93 Start: 69594, Stop: 68677, Start Num: 13

Candidate Starts for Worcestershire\_93:

(Start: 13 @69594 has 28 MA's), (16, 69573), (29, 69438), (35, 69393), (40, 69267), (42, 69231), (44, 69219), (47, 69129), (48, 69123), (50, 69114), (51, 69090), (52, 69063), (55, 69036), (58, 68934), (59, 68931), (60, 68913), (61, 68901), (62, 68886), (63, 68883), (65, 68874), (66, 68871), (67, 68820), (68, 68739),