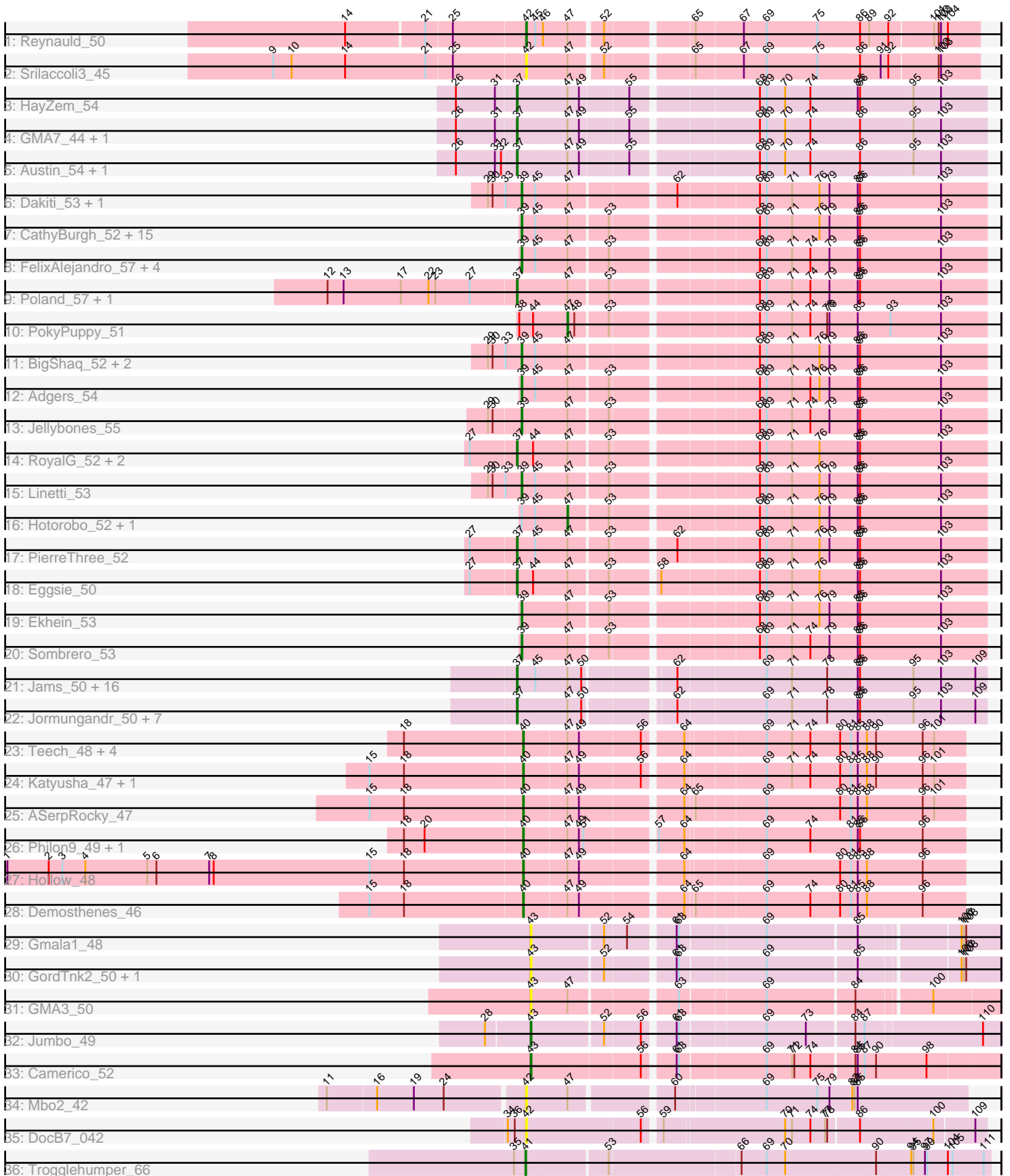


# Pham 303267



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 303267 Report

This analysis was run 06/08/26 on database version 649.

Pham number 303267 has 94 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Reynauld\_50
- Track 2 : Srilaccoli3\_45
- Track 3 : HayZem\_54
- Track 4 : GMA7\_44, Amore2\_55
- Track 5 : Austin\_54, GTE7\_43
- Track 6 : Dakiti\_53, Chelms\_52
- Track 7 : CathyBurgh\_52, Squibbles\_52, John316\_56, Sam12\_52, GourdThymes\_52, Kelzog\_54, RemRem\_53, Worcestershire\_53, Monty\_51, Barbochs\_51, BirksAndSocks\_57, Flakey\_52, Gorko\_52, Lizzo\_52, Exiguo\_52, Beaver\_56
- Track 8 : FelixAlejandro\_57, Butterball\_56, CinnamonToast\_58, Boneham\_56, BillyBobJr\_58
- Track 9 : Poland\_57, Msay19\_57
- Track 10 : PokyPuppy\_51
- Track 11 : BigShaq\_52, BenoitCattle\_53, Crete\_53
- Track 12 : Adgers\_54
- Track 13 : Jellybones\_55
- Track 14 : RoyalG\_52, Diabla\_55, SteveFrench\_51
- Track 15 : Linetti\_53
- Track 16 : Hotorobo\_52, Breezic\_52
- Track 17 : PierreThree\_52
- Track 18 : Eggsie\_50
- Track 19 : Ekhein\_53
- Track 20 : Sombrero\_53
- Track 21 : Jams\_50, Charianelly\_50, Luker\_51, Shelley\_50, MrWormie\_50, Anamika\_50, Kaseim\_50, Damp\_50, Sticker17\_50, Newt\_51, Hello\_50, Berries\_50, Hail2Pitt\_49, Woes\_50, Lidong\_50, Bianmat\_50, Minos\_51
- Track 22 : Jormungandr\_50, GalacticEye\_50, Nimi13\_50, Teal\_50, Lahirium\_50, Neovie\_50, Guillaume\_50, Harambe\_50
- Track 23 : Teech\_48, Tredge\_48, Niagara\_47, Kvothe\_47, Teatealatte\_48
- Track 24 : Katyusha\_47, Benczkowski14\_47
- Track 25 : ASerpRocky\_47
- Track 26 : Philon9\_49, Vitaenoi\_49
- Track 27 : Hollow\_48
- Track 28 : Demosthenes\_46
- Track 29 : Gmala1\_48
- Track 30 : GordTnk2\_50, GordDuk1\_49

- Track 31 : GMA3\_50
- Track 32 : Jumbo\_49
- Track 33 : Camerico\_52
- Track 34 : Mbo2\_42
- Track 35 : DocB7\_042
- Track 36 : Trogglehumper\_66

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

The start number called the most often in the published annotations is 37, it was called in 35 of the 80 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amore2\_55, Anamika\_50, Austin\_54, Berries\_50, Bianmat\_50, Charianelly\_50, Damp\_50, Diabla\_55, Eggsie\_50, GMA7\_44, GTE7\_43, GalacticEye\_50, Guillaume\_50, Hail2Pitt\_49, Harambe\_50, HayZem\_54, Hello\_50, Jams\_50, Jormungandr\_50, Kaseim\_50, Lahirium\_50, Lidong\_50, Luker\_51, Minos\_51, MrWormie\_50, Msay19\_57, Neoevie\_50, Newt\_51, Nimi13\_50, PierreThree\_52, Poland\_57, RoyalG\_52, Shelley\_50, SteveFrench\_51, Sticker17\_50, Teal\_50, Woes\_50,

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

- 

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

- ASerpRocky\_47, Adgers\_54, Barbochs\_51, Beaver\_56, Benczkowski14\_47, BenoitCattle\_53, BigShaq\_52, BillyBobJr\_58, BirksAndSocks\_57, Boneham\_56, Breezic\_52, Butterball\_56, Camerico\_52, CathyBurgh\_52, Chelms\_52, CinnamonToast\_58, Crete\_53, Dakiti\_53, Demosthenes\_46, DocB7\_042, Ekhein\_53, Exiguo\_52, FelixAlejandro\_57, Flakey\_52, GMA3\_50, Gmala1\_48, GordDuk1\_49, GordTnk2\_50, Gorko\_52, GourdThymes\_52, Hollow\_48, Hotorobo\_52, Jellybones\_55, John316\_56, Jumbo\_49, Katyusha\_47, Kelzog\_54, Kvothe\_47, Linetti\_53, Lizzo\_52, Mbo2\_42, Monty\_51, Niagara\_47, Philon9\_49, PokyPuppy\_51, RemRem\_53, Reynauld\_50, Sam12\_52, Sombrero\_53, Squibbles\_52, Srilaccoli3\_45, Teatealatte\_48, Teech\_48, Tredge\_48, Trogglehumper\_66, Vitaenoi\_49, Worcestershire\_53,

### **Summary by start number:**

Start 37:

- Found in 37 of 94 ( 39.4% ) of genes in pham
- Manual Annotations of this start: 35 of 80
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amore2\_55 (CS1), Anamika\_50 (CS3), Austin\_54 (CS1), Berries\_50 (CS3), Bianmat\_50 (CS3), Charianelly\_50 (CS3), Damp\_50 (CS3), Diabla\_55 (CS2), Eggsie\_50 (CS2), GMA7\_44 (CS1), GTE7\_43 (CS1), GalacticEye\_50 (CS3), Guillaume\_50 (CS3), Hail2Pitt\_49 (CS3), Harambe\_50 (CS3), HayZem\_54 (CS1), Hello\_50 (CS3), Jams\_50 (CS3), Jormungandr\_50 (CS3), Kaseim\_50 (CS3), Lahirium\_50 (CS3), Lidong\_50 (CS3), Luker\_51 (CS3), Minos\_51 (CS3), MrWormie\_50 (CS3), Msay19\_57 (CS2), Neoevie\_50 (CS3), Newt\_51 (CS3),

Nimi13\_50 (CS3), PierreThree\_52 (CS2), Poland\_57 (CS2), RoyalG\_52 (CS2), Shelley\_50 (CS3), SteveFrench\_51 (CS2), Sticker17\_50 (CS3), Teal\_50 (CS3), Woes\_50 (CS3),

Start 39:

- Found in 33 of 94 ( 35.1% ) of genes in pham
- Manual Annotations of this start: 26 of 80
- Called 93.9% of time when present
- Phage (with cluster) where this start called: Adgers\_54 (CS2), Barbochs\_51 (CS2), Beaver\_56 (CS2), BenoitCattle\_53 (CS2), BigShaq\_52 (CS2), BillyBobJr\_58 (CS2), BirksAndSocks\_57 (CS2), Boneham\_56 (CS2), Butterball\_56 (CS2), CathyBurgh\_52 (CS2), Chelms\_52 (CS2), CinnamonToast\_58 (CS2), Crete\_53 (CS2), Dakiti\_53 (CS2), Ekhein\_53 (CS2), Exiguo\_52 (CS2), FelixAlejandro\_57 (CS2), Flakey\_52 (CS2), Gorko\_52 (CS2), GourdThymes\_52 (CS2), Jellybones\_55 (CS2), John316\_56 (CS2), Kelzog\_54 (CS2), Linetti\_53 (CS2), Lizzo\_52 (CS2), Monty\_51 (CS2), RemRem\_53 (CS2), Sam12\_52 (CS2), Sombrero\_53 (CS2), Squibbles\_52 (CS2), Worcestershire\_53 (CS2),

Start 40:

- Found in 12 of 94 ( 12.8% ) of genes in pham
- Manual Annotations of this start: 12 of 80
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ASerpRocky\_47 (CS4), Benczkowski14\_47 (CS4), Demosthenes\_46 (CS4), Hollow\_48 (CS4), Katyusha\_47 (CS4), Kvothe\_47 (CS4), Niagara\_47 (CS4), Philon9\_49 (CS4), Teatealatte\_48 (CS4), Teech\_48 (CS4), Tredge\_48 (CS4), Vitaenoi\_49 (CS4),

Start 41:

- Found in 1 of 94 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 80
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Trogglehumper\_66 (singleton),

Start 42:

- Found in 4 of 94 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 1 of 80
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DocB7\_042 (singleton), Mbo2\_42 (singleton), Reynauld\_50 (CH), Srilaccoli3\_45 (CH),

Start 43:

- Found in 6 of 94 ( 6.4% ) of genes in pham
- Manual Annotations of this start: 2 of 80
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Camerico\_52 (DF4), GMA3\_50 (DF2), Gmala1\_48 (DF1), GordDuk1\_49 (DF1), GordTnk2\_50 (DF1), Jumbo\_49 (DF3),

Start 47:

- Found in 87 of 94 ( 92.6% ) of genes in pham
- Manual Annotations of this start: 3 of 80
- Called 3.4% of time when present
- Phage (with cluster) where this start called: Breezic\_52 (CS2), Hotorobo\_52 (CS2), PokyPuppy\_51 (CS2),

## Summary by clusters:

There are 10 clusters represented in this pham: singleton, CH, DF4, DF1, DF3, DF2, CS4, CS1, CS3, CS2,

Info for manual annotations of cluster CH:

- Start number 42 was manually annotated 1 time for cluster CH.

Info for manual annotations of cluster CS1:

- Start number 37 was manually annotated 3 times for cluster CS1.

Info for manual annotations of cluster CS2:

- Start number 37 was manually annotated 7 times for cluster CS2.
- Start number 39 was manually annotated 26 times for cluster CS2.
- Start number 47 was manually annotated 3 times for cluster CS2.

Info for manual annotations of cluster CS3:

- Start number 37 was manually annotated 25 times for cluster CS3.

Info for manual annotations of cluster CS4:

- Start number 40 was manually annotated 12 times for cluster CS4.

Info for manual annotations of cluster DF3:

- Start number 43 was manually annotated 1 time for cluster DF3.

Info for manual annotations of cluster DF4:

- Start number 43 was manually annotated 1 time for cluster DF4.

## Gene Information:

Gene: ASerpRocky\_47 Start: 47956, Stop: 47420, Start Num: 40

Candidate Starts for ASerpRocky\_47:

(15, 48154), (18, 48109), (Start: 40 @47956 has 12 MA's), (Start: 47 @47902 has 3 MA's), (49, 47887), (64, 47764), (65, 47755), (69, 47671), (80, 47578), (81, 47566), (85, 47557), (88, 47545), (96, 47473), (101, 47458),

Gene: Adgers\_54 Start: 47499, Stop: 46936, Start Num: 39

Candidate Starts for Adgers\_54:

(Start: 39 @47499 has 26 MA's), (45, 47481), (Start: 47 @47442 has 3 MA's), (53, 47394), (68, 47223), (69, 47214), (71, 47181), (74, 47157), (76, 47145), (79, 47133), (85, 47100), (86, 47097), (103, 46992),

Gene: Amore2\_55 Start: 47896, Stop: 47321, Start Num: 37

Candidate Starts for Amore2\_55:

(26, 47971), (31, 47920), (Start: 37 @47896 has 35 MA's), (Start: 47 @47833 has 3 MA's), (49, 47818), (55, 47758), (68, 47608), (69, 47599), (70, 47575), (74, 47542), (86, 47482), (95, 47413), (103, 47377),

Gene: Anamika\_50 Start: 48401, Stop: 47832, Start Num: 37

Candidate Starts for Anamika\_50:

(Start: 37 @48401 has 35 MA's), (45, 48377), (Start: 47 @48338 has 3 MA's), (50, 48320), (62, 48218), (69, 48110), (71, 48077), (78, 48032), (85, 47996), (86, 47993), (95, 47924), (103, 47888), (109, 47846),

Gene: Austin\_54 Start: 47894, Stop: 47319, Start Num: 37

Candidate Starts for Austin\_54:

(26, 47969), (31, 47918), (32, 47912), (Start: 37 @47894 has 35 MA's), (Start: 47 @47831 has 3 MA's), (49, 47816), (55, 47756), (68, 47606), (69, 47597), (70, 47573), (74, 47540), (86, 47480), (95, 47411), (103, 47375),

Gene: Barbochs\_51 Start: 47243, Stop: 46680, Start Num: 39

Candidate Starts for Barbochs\_51:

(Start: 39 @47243 has 26 MA's), (45, 47225), (Start: 47 @47186 has 3 MA's), (53, 47138), (68, 46967), (69, 46958), (71, 46925), (76, 46889), (79, 46877), (85, 46844), (86, 46841), (103, 46736),

Gene: Beaver\_56 Start: 49013, Stop: 48450, Start Num: 39

Candidate Starts for Beaver\_56:

(Start: 39 @49013 has 26 MA's), (45, 48995), (Start: 47 @48956 has 3 MA's), (53, 48908), (68, 48737), (69, 48728), (71, 48695), (76, 48659), (79, 48647), (85, 48614), (86, 48611), (103, 48506),

Gene: Benczkowski14\_47 Start: 48227, Stop: 47691, Start Num: 40

Candidate Starts for Benczkowski14\_47:

(15, 48425), (18, 48380), (Start: 40 @48227 has 12 MA's), (Start: 47 @48173 has 3 MA's), (49, 48158), (56, 48080), (64, 48035), (69, 47942), (71, 47909), (74, 47885), (80, 47849), (81, 47837), (85, 47828), (88, 47816), (90, 47804), (96, 47744), (101, 47729),

Gene: BenoitCattle\_53 Start: 47606, Stop: 47043, Start Num: 39

Candidate Starts for BenoitCattle\_53:

(29, 47645), (30, 47639), (33, 47627), (Start: 39 @47606 has 26 MA's), (45, 47588), (Start: 47 @47549 has 3 MA's), (68, 47330), (69, 47321), (71, 47288), (76, 47252), (79, 47240), (85, 47207), (86, 47204), (103, 47099),

Gene: Berries\_50 Start: 48373, Stop: 47804, Start Num: 37

Candidate Starts for Berries\_50:

(Start: 37 @48373 has 35 MA's), (45, 48349), (Start: 47 @48310 has 3 MA's), (50, 48292), (62, 48190), (69, 48082), (71, 48049), (78, 48004), (85, 47968), (86, 47965), (95, 47896), (103, 47860), (109, 47818),

Gene: Bianmat\_50 Start: 48413, Stop: 47844, Start Num: 37

Candidate Starts for Bianmat\_50:

(Start: 37 @48413 has 35 MA's), (45, 48389), (Start: 47 @48350 has 3 MA's), (50, 48332), (62, 48230), (69, 48122), (71, 48089), (78, 48044), (85, 48008), (86, 48005), (95, 47936), (103, 47900), (109, 47858),

Gene: BigShaq\_52 Start: 47611, Stop: 47048, Start Num: 39

Candidate Starts for BigShaq\_52:

(29, 47650), (30, 47644), (33, 47632), (Start: 39 @47611 has 26 MA's), (45, 47593), (Start: 47 @47554 has 3 MA's), (68, 47335), (69, 47326), (71, 47293), (76, 47257), (79, 47245), (85, 47212), (86, 47209), (103, 47104),

Gene: BillyBobJr\_58 Start: 49323, Stop: 48760, Start Num: 39

Candidate Starts for BillyBobJr\_58:

(Start: 39 @49323 has 26 MA's), (45, 49305), (Start: 47 @49266 has 3 MA's), (53, 49218), (68, 49047), (69, 49038), (71, 49005), (74, 48981), (79, 48957), (85, 48924), (86, 48921), (103, 48816),

Gene: BirksAndSocks\_57 Start: 49363, Stop: 48800, Start Num: 39

Candidate Starts for BirksAndSocks\_57:

(Start: 39 @49363 has 26 MA's), (45, 49345), (Start: 47 @49306 has 3 MA's), (53, 49258), (68, 49087), (69, 49078), (71, 49045), (76, 49009), (79, 48997), (85, 48964), (86, 48961), (103, 48856),

Gene: Boneham\_56 Start: 49264, Stop: 48701, Start Num: 39

Candidate Starts for Boneham\_56:

(Start: 39 @49264 has 26 MA's), (45, 49246), (Start: 47 @49207 has 3 MA's), (53, 49159), (68, 48988), (69, 48979), (71, 48946), (74, 48922), (79, 48898), (85, 48865), (86, 48862), (103, 48757),

Gene: Breezic\_52 Start: 47199, Stop: 46693, Start Num: 47

Candidate Starts for Breezic\_52:

(Start: 39 @47256 has 26 MA's), (45, 47238), (Start: 47 @47199 has 3 MA's), (53, 47151), (68, 46980), (69, 46971), (71, 46938), (76, 46902), (79, 46890), (85, 46857), (86, 46854), (103, 46749),

Gene: Butterball\_56 Start: 49269, Stop: 48706, Start Num: 39

Candidate Starts for Butterball\_56:

(Start: 39 @49269 has 26 MA's), (45, 49251), (Start: 47 @49212 has 3 MA's), (53, 49164), (68, 48993), (69, 48984), (71, 48951), (74, 48927), (79, 48903), (85, 48870), (86, 48867), (103, 48762),

Gene: Camerico\_52 Start: 49576, Stop: 49001, Start Num: 43

Candidate Starts for Camerico\_52:

(Start: 43 @49576 has 2 MA's), (56, 49438), (61, 49405), (63, 49402), (69, 49294), (71, 49261), (72, 49258), (74, 49237), (84, 49186), (85, 49183), (87, 49174), (90, 49159), (98, 49093),

Gene: CathyBurgh\_52 Start: 47833, Stop: 47270, Start Num: 39

Candidate Starts for CathyBurgh\_52:

(Start: 39 @47833 has 26 MA's), (45, 47815), (Start: 47 @47776 has 3 MA's), (53, 47728), (68, 47557), (69, 47548), (71, 47515), (76, 47479), (79, 47467), (85, 47434), (86, 47431), (103, 47326),

Gene: Charianelly\_50 Start: 48123, Stop: 47554, Start Num: 37

Candidate Starts for Charianelly\_50:

(Start: 37 @48123 has 35 MA's), (45, 48099), (Start: 47 @48060 has 3 MA's), (50, 48042), (62, 47940), (69, 47832), (71, 47799), (78, 47754), (85, 47718), (86, 47715), (95, 47646), (103, 47610), (109, 47568),

Gene: Chelms\_52 Start: 47599, Stop: 47036, Start Num: 39

Candidate Starts for Chelms\_52:

(29, 47638), (30, 47632), (33, 47620), (Start: 39 @47599 has 26 MA's), (45, 47581), (Start: 47 @47542 has 3 MA's), (62, 47419), (68, 47323), (69, 47314), (71, 47281), (76, 47245), (79, 47233), (85, 47200), (86, 47197), (103, 47092),

Gene: CinnamonToast\_58 Start: 49323, Stop: 48760, Start Num: 39

Candidate Starts for CinnamonToast\_58:

(Start: 39 @49323 has 26 MA's), (45, 49305), (Start: 47 @49266 has 3 MA's), (53, 49218), (68, 49047), (69, 49038), (71, 49005), (74, 48981), (79, 48957), (85, 48924), (86, 48921), (103, 48816),

Gene: Crete\_53 Start: 47877, Stop: 47314, Start Num: 39

Candidate Starts for Crete\_53:

(29, 47916), (30, 47910), (33, 47898), (Start: 39 @47877 has 26 MA's), (45, 47859), (Start: 47 @47820 has 3 MA's), (68, 47601), (69, 47592), (71, 47559), (76, 47523), (79, 47511), (85, 47478), (86, 47475), (103, 47370),

Gene: Dakiti\_53 Start: 48467, Stop: 47904, Start Num: 39

Candidate Starts for Dakiti\_53:

(29, 48506), (30, 48500), (33, 48488), (Start: 39 @48467 has 26 MA's), (45, 48449), (Start: 47 @48410 has 3 MA's), (62, 48287), (68, 48191), (69, 48182), (71, 48149), (76, 48113), (79, 48101), (85, 48068), (86, 48065), (103, 47960),

Gene: Damp\_50 Start: 47287, Stop: 46718, Start Num: 37

Candidate Starts for Damp\_50:

(Start: 37 @47287 has 35 MA's), (45, 47263), (Start: 47 @47224 has 3 MA's), (50, 47206), (62, 47104), (69, 46996), (71, 46963), (78, 46918), (85, 46882), (86, 46879), (95, 46810), (103, 46774), (109, 46732),

Gene: Demosthenes\_46 Start: 47932, Stop: 47396, Start Num: 40

Candidate Starts for Demosthenes\_46:

(15, 48130), (18, 48085), (Start: 40 @47932 has 12 MA's), (Start: 47 @47878 has 3 MA's), (49, 47863), (64, 47740), (65, 47731), (69, 47647), (74, 47590), (80, 47554), (81, 47542), (85, 47533), (88, 47521), (96, 47449),

Gene: Diabla\_55 Start: 49046, Stop: 48477, Start Num: 37

Candidate Starts for Diabla\_55:

(27, 49103), (Start: 37 @49046 has 35 MA's), (44, 49025), (Start: 47 @48983 has 3 MA's), (53, 48935), (68, 48764), (69, 48755), (71, 48722), (76, 48686), (85, 48641), (86, 48638), (103, 48533),

Gene: DocB7\_042 Start: 39836, Stop: 39279, Start Num: 42

Candidate Starts for DocB7\_042:

(34, 39860), (36, 39851), (Start: 42 @39836 has 1 MA's), (56, 39692), (59, 39674), (70, 39524), (71, 39515), (74, 39491), (77, 39473), (78, 39470), (86, 39434), (100, 39341), (109, 39293),

Gene: Eggsie\_50 Start: 47008, Stop: 46439, Start Num: 37

Candidate Starts for Eggsie\_50:

(27, 47065), (Start: 37 @47008 has 35 MA's), (44, 46987), (Start: 47 @46945 has 3 MA's), (53, 46897), (58, 46843), (68, 46726), (69, 46717), (71, 46684), (76, 46648), (85, 46603), (86, 46600), (103, 46495),

Gene: Ekhein\_53 Start: 46961, Stop: 46398, Start Num: 39

Candidate Starts for Ekhein\_53:

(Start: 39 @46961 has 26 MA's), (Start: 47 @46904 has 3 MA's), (53, 46856), (68, 46685), (69, 46676), (71, 46643), (76, 46607), (79, 46595), (85, 46562), (86, 46559), (103, 46454),

Gene: Exiguo\_52 Start: 46973, Stop: 46410, Start Num: 39

Candidate Starts for Exiguo\_52:

(Start: 39 @46973 has 26 MA's), (45, 46955), (Start: 47 @46916 has 3 MA's), (53, 46868), (68, 46697), (69, 46688), (71, 46655), (76, 46619), (79, 46607), (85, 46574), (86, 46571), (103, 46466),

Gene: FelixAlejandro\_57 Start: 49467, Stop: 48904, Start Num: 39

Candidate Starts for FelixAlejandro\_57:

(Start: 39 @49467 has 26 MA's), (45, 49449), (Start: 47 @49410 has 3 MA's), (53, 49362), (68, 49191), (69, 49182), (71, 49149), (74, 49125), (79, 49101), (85, 49068), (86, 49065), (103, 48960),

Gene: Flakey\_52 Start: 47837, Stop: 47274, Start Num: 39

Candidate Starts for Flakey\_52:

(Start: 39 @47837 has 26 MA's), (45, 47819), (Start: 47 @47780 has 3 MA's), (53, 47732), (68, 47561), (69, 47552), (71, 47519), (76, 47483), (79, 47471), (85, 47438), (86, 47435), (103, 47330),

Gene: GMA3\_50 Start: 46070, Stop: 45516, Start Num: 43

Candidate Starts for GMA3\_50:

(Start: 43 @46070 has 2 MA's), (Start: 47 @46022 has 3 MA's), (63, 45899), (69, 45794), (84, 45686), (100, 45599),

Gene: GMA7\_44 Start: 42110, Stop: 41535, Start Num: 37

Candidate Starts for GMA7\_44:

(26, 42185), (31, 42134), (Start: 37 @42110 has 35 MA's), (Start: 47 @42047 has 3 MA's), (49, 42032), (55, 41972), (68, 41822), (69, 41813), (70, 41789), (74, 41756), (86, 41696), (95, 41627), (103, 41591),

Gene: GTE7\_43 Start: 42141, Stop: 41566, Start Num: 37

Candidate Starts for GTE7\_43:

(26, 42216), (31, 42165), (32, 42159), (Start: 37 @42141 has 35 MA's), (Start: 47 @42078 has 3 MA's), (49, 42063), (55, 42003), (68, 41853), (69, 41844), (70, 41820), (74, 41787), (86, 41727), (95, 41658), (103, 41622),

Gene: GalacticEye\_50 Start: 48084, Stop: 47515, Start Num: 37

Candidate Starts for GalacticEye\_50:

(Start: 37 @48084 has 35 MA's), (Start: 47 @48021 has 3 MA's), (50, 48003), (62, 47901), (69, 47793), (71, 47760), (78, 47715), (85, 47679), (86, 47676), (95, 47607), (103, 47571), (109, 47529),

Gene: Gmala1\_48 Start: 44268, Stop: 43714, Start Num: 43

Candidate Starts for Gmala1\_48:

(Start: 43 @44268 has 2 MA's), (52, 44178), (54, 44151), (61, 44100), (63, 44097), (69, 43992), (85, 43881), (106, 43764), (107, 43761), (108, 43758),

Gene: GordDuk1\_49 Start: 44419, Stop: 43865, Start Num: 43

Candidate Starts for GordDuk1\_49:

(Start: 43 @44419 has 2 MA's), (52, 44329), (61, 44251), (63, 44248), (69, 44143), (85, 44032), (106, 43915), (107, 43912), (108, 43909),

Gene: GordTnk2\_50 Start: 44573, Stop: 44019, Start Num: 43

Candidate Starts for GordTnk2\_50:

(Start: 43 @44573 has 2 MA's), (52, 44483), (61, 44405), (63, 44402), (69, 44297), (85, 44186), (106, 44069), (107, 44066), (108, 44063),

Gene: Gorko\_52 Start: 46965, Stop: 46402, Start Num: 39

Candidate Starts for Gorko\_52:

(Start: 39 @46965 has 26 MA's), (45, 46947), (Start: 47 @46908 has 3 MA's), (53, 46860), (68, 46689), (69, 46680), (71, 46647), (76, 46611), (79, 46599), (85, 46566), (86, 46563), (103, 46458),

Gene: GourdThymes\_52 Start: 47839, Stop: 47276, Start Num: 39

Candidate Starts for GourdThymes\_52:

(Start: 39 @47839 has 26 MA's), (45, 47821), (Start: 47 @47782 has 3 MA's), (53, 47734), (68, 47563), (69, 47554), (71, 47521), (76, 47485), (79, 47473), (85, 47440), (86, 47437), (103, 47332),

Gene: Guillaume\_50 Start: 48134, Stop: 47565, Start Num: 37

Candidate Starts for Guillaume\_50:

(Start: 37 @48134 has 35 MA's), (Start: 47 @48071 has 3 MA's), (50, 48053), (62, 47951), (69, 47843), (71, 47810), (78, 47765), (85, 47729), (86, 47726), (95, 47657), (103, 47621), (109, 47579),

Gene: Hail2Pitt\_49 Start: 48610, Stop: 48041, Start Num: 37

Candidate Starts for Hail2Pitt\_49:

(Start: 37 @48610 has 35 MA's), (45, 48586), (Start: 47 @48547 has 3 MA's), (50, 48529), (62, 48427), (69, 48319), (71, 48286), (78, 48241), (85, 48205), (86, 48202), (95, 48133), (103, 48097), (109, 48055),

Gene: Harambe\_50 Start: 48401, Stop: 47832, Start Num: 37

Candidate Starts for Harambe\_50:

(Start: 37 @48401 has 35 MA's), (Start: 47 @48338 has 3 MA's), (50, 48320), (62, 48218), (69, 48110), (71, 48077), (78, 48032), (85, 47996), (86, 47993), (95, 47924), (103, 47888), (109, 47846),

Gene: HayZem\_54 Start: 47893, Stop: 47318, Start Num: 37

Candidate Starts for HayZem\_54:

(26, 47968), (31, 47917), (Start: 37 @47893 has 35 MA's), (Start: 47 @47830 has 3 MA's), (49, 47815), (55, 47755), (68, 47605), (69, 47596), (70, 47572), (74, 47539), (85, 47482), (86, 47479), (95, 47410), (103, 47374),

Gene: Hello\_50 Start: 48363, Stop: 47794, Start Num: 37

Candidate Starts for Hello\_50:

(Start: 37 @48363 has 35 MA's), (45, 48339), (Start: 47 @48300 has 3 MA's), (50, 48282), (62, 48180), (69, 48072), (71, 48039), (78, 47994), (85, 47958), (86, 47955), (95, 47886), (103, 47850), (109, 47808),

Gene: Hollow\_48 Start: 48563, Stop: 48027, Start Num: 40

Candidate Starts for Hollow\_48:

(1, 49235), (2, 49181), (3, 49163), (4, 49133), (5, 49052), (6, 49040), (7, 48971), (8, 48965), (15, 48761), (18, 48716), (Start: 40 @48563 has 12 MA's), (Start: 47 @48509 has 3 MA's), (49, 48494), (64, 48371), (69, 48278), (80, 48185), (81, 48173), (85, 48164), (88, 48152), (96, 48080),

Gene: Hotorobo\_52 Start: 47787, Stop: 47281, Start Num: 47

Candidate Starts for Hotorobo\_52:

(Start: 39 @47844 has 26 MA's), (45, 47826), (Start: 47 @47787 has 3 MA's), (53, 47739), (68, 47568), (69, 47559), (71, 47526), (76, 47490), (79, 47478), (85, 47445), (86, 47442), (103, 47337),

Gene: Jams\_50 Start: 47573, Stop: 47004, Start Num: 37

Candidate Starts for Jams\_50:

(Start: 37 @47573 has 35 MA's), (45, 47549), (Start: 47 @47510 has 3 MA's), (50, 47492), (62, 47390), (69, 47282), (71, 47249), (78, 47204), (85, 47168), (86, 47165), (95, 47096), (103, 47060), (109, 47018),

Gene: Jellybones\_55 Start: 48945, Stop: 48382, Start Num: 39

Candidate Starts for Jellybones\_55:

(29, 48984), (30, 48978), (Start: 39 @48945 has 26 MA's), (Start: 47 @48888 has 3 MA's), (53, 48840), (68, 48669), (69, 48660), (71, 48627), (74, 48603), (79, 48579), (85, 48546), (86, 48543), (103, 48438),

Gene: John316\_56 Start: 49002, Stop: 48439, Start Num: 39

Candidate Starts for John316\_56:

(Start: 39 @49002 has 26 MA's), (45, 48984), (Start: 47 @48945 has 3 MA's), (53, 48897), (68, 48726), (69, 48717), (71, 48684), (76, 48648), (79, 48636), (85, 48603), (86, 48600), (103, 48495),

Gene: Jormungandr\_50 Start: 48116, Stop: 47547, Start Num: 37

Candidate Starts for Jormungandr\_50:

(Start: 37 @48116 has 35 MA's), (Start: 47 @48053 has 3 MA's), (50, 48035), (62, 47933), (69, 47825), (71, 47792), (78, 47747), (85, 47711), (86, 47708), (95, 47639), (103, 47603), (109, 47561),

Gene: Jumbo\_49 Start: 48952, Stop: 48386, Start Num: 43

Candidate Starts for Jumbo\_49:

(28, 49006), (Start: 43 @48952 has 2 MA's), (52, 48862), (56, 48817), (61, 48784), (63, 48781), (69, 48676), (73, 48625), (84, 48568), (87, 48556), (110, 48409),

Gene: Kaseim\_50 Start: 47558, Stop: 46989, Start Num: 37

Candidate Starts for Kaseim\_50:

(Start: 37 @47558 has 35 MA's), (45, 47534), (Start: 47 @47495 has 3 MA's), (50, 47477), (62, 47375), (69, 47267), (71, 47234), (78, 47189), (85, 47153), (86, 47150), (95, 47081), (103, 47045), (109, 47003),

Gene: Katyusha\_47 Start: 48227, Stop: 47691, Start Num: 40

Candidate Starts for Katyusha\_47:

(15, 48425), (18, 48380), (Start: 40 @48227 has 12 MA's), (Start: 47 @48173 has 3 MA's), (49, 48158), (56, 48080), (64, 48035), (69, 47942), (71, 47909), (74, 47885), (80, 47849), (81, 47837), (85, 47828), (88, 47816), (90, 47804), (96, 47744), (101, 47729),

Gene: Kelzog\_54 Start: 47851, Stop: 47288, Start Num: 39

Candidate Starts for Kelzog\_54:

(Start: 39 @47851 has 26 MA's), (45, 47833), (Start: 47 @47794 has 3 MA's), (53, 47746), (68, 47575), (69, 47566), (71, 47533), (76, 47497), (79, 47485), (85, 47452), (86, 47449), (103, 47344),

Gene: Kvothe\_47 Start: 48126, Stop: 47590, Start Num: 40

Candidate Starts for Kvothe\_47:

(18, 48279), (Start: 40 @48126 has 12 MA's), (Start: 47 @48072 has 3 MA's), (49, 48057), (56, 47979), (64, 47934), (69, 47841), (71, 47808), (74, 47784), (80, 47748), (81, 47736), (85, 47727), (88, 47715), (90, 47703), (96, 47643), (101, 47628),

Gene: Lahirium\_50 Start: 48638, Stop: 48069, Start Num: 37

Candidate Starts for Lahirium\_50:

(Start: 37 @48638 has 35 MA's), (Start: 47 @48575 has 3 MA's), (50, 48557), (62, 48455), (69, 48347), (71, 48314), (78, 48269), (85, 48233), (86, 48230), (95, 48161), (103, 48125), (109, 48083),

Gene: Lidong\_50 Start: 48373, Stop: 47804, Start Num: 37

Candidate Starts for Lidong\_50:

(Start: 37 @48373 has 35 MA's), (45, 48349), (Start: 47 @48310 has 3 MA's), (50, 48292), (62, 48190), (69, 48082), (71, 48049), (78, 48004), (85, 47968), (86, 47965), (95, 47896), (103, 47860), (109, 47818),

Gene: Linetti\_53 Start: 48608, Stop: 48045, Start Num: 39

Candidate Starts for Linetti\_53:

(29, 48647), (30, 48641), (33, 48629), (Start: 39 @48608 has 26 MA's), (45, 48590), (Start: 47 @48551 has 3 MA's), (53, 48503), (68, 48332), (69, 48323), (71, 48290), (76, 48254), (79, 48242), (85, 48209), (86, 48206), (103, 48101),

Gene: Lizzo\_52 Start: 47833, Stop: 47270, Start Num: 39

Candidate Starts for Lizzo\_52:

(Start: 39 @47833 has 26 MA's), (45, 47815), (Start: 47 @47776 has 3 MA's), (53, 47728), (68, 47557), (69, 47548), (71, 47515), (76, 47479), (79, 47467), (85, 47434), (86, 47431), (103, 47326),

Gene: Luker\_51 Start: 48591, Stop: 48022, Start Num: 37

Candidate Starts for Luker\_51:

(Start: 37 @48591 has 35 MA's), (45, 48567), (Start: 47 @48528 has 3 MA's), (50, 48510), (62, 48408), (69, 48300), (71, 48267), (78, 48222), (85, 48186), (86, 48183), (95, 48114), (103, 48078), (109, 48036),

Gene: Mbo2\_42 Start: 37548, Stop: 37012, Start Num: 42

Candidate Starts for Mbo2\_42:

(11, 37794), (16, 37731), (19, 37683), (24, 37644), (Start: 42 @37548 has 1 MA's), (Start: 47 @37497 has 3 MA's), (60, 37377), (69, 37269), (75, 37203), (79, 37188), (82, 37158), (83, 37155), (85, 37152),

Gene: Minos\_51 Start: 48115, Stop: 47546, Start Num: 37

Candidate Starts for Minos\_51:

(Start: 37 @48115 has 35 MA's), (45, 48091), (Start: 47 @48052 has 3 MA's), (50, 48034), (62, 47932), (69, 47824), (71, 47791), (78, 47746), (85, 47710), (86, 47707), (95, 47638), (103, 47602), (109, 47560),

Gene: Monty\_51 Start: 46983, Stop: 46420, Start Num: 39

Candidate Starts for Monty\_51:

(Start: 39 @46983 has 26 MA's), (45, 46965), (Start: 47 @46926 has 3 MA's), (53, 46878), (68, 46707), (69, 46698), (71, 46665), (76, 46629), (79, 46617), (85, 46584), (86, 46581), (103, 46476),

Gene: MrWormie\_50 Start: 47276, Stop: 46707, Start Num: 37

Candidate Starts for MrWormie\_50:

(Start: 37 @47276 has 35 MA's), (45, 47252), (Start: 47 @47213 has 3 MA's), (50, 47195), (62, 47093), (69, 46985), (71, 46952), (78, 46907), (85, 46871), (86, 46868), (95, 46799), (103, 46763), (109, 46721),

Gene: Msay19\_57 Start: 49462, Stop: 48893, Start Num: 37

Candidate Starts for Msay19\_57:

(12, 49705), (13, 49684), (17, 49609), (22, 49573), (23, 49564), (27, 49519), (Start: 37 @49462 has 35 MA's), (Start: 47 @49399 has 3 MA's), (53, 49351), (68, 49180), (69, 49171), (71, 49138), (74, 49114), (79, 49090), (85, 49057), (86, 49054), (103, 48949),

Gene: Neoevie\_50 Start: 48377, Stop: 47808, Start Num: 37

Candidate Starts for Neoevie\_50:

(Start: 37 @48377 has 35 MA's), (Start: 47 @48314 has 3 MA's), (50, 48296), (62, 48194), (69, 48086), (71, 48053), (78, 48008), (85, 47972), (86, 47969), (95, 47900), (103, 47864), (109, 47822),

Gene: Newt\_51 Start: 48605, Stop: 48036, Start Num: 37

Candidate Starts for Newt\_51:

(Start: 37 @48605 has 35 MA's), (45, 48581), (Start: 47 @48542 has 3 MA's), (50, 48524), (62, 48422), (69, 48314), (71, 48281), (78, 48236), (85, 48200), (86, 48197), (95, 48128), (103, 48092), (109, 48050),

Gene: Niagara\_47 Start: 48217, Stop: 47681, Start Num: 40

Candidate Starts for Niagara\_47:

(18, 48370), (Start: 40 @48217 has 12 MA's), (Start: 47 @48163 has 3 MA's), (49, 48148), (56, 48070), (64, 48025), (69, 47932), (71, 47899), (74, 47875), (80, 47839), (81, 47827), (85, 47818), (88, 47806), (90, 47794), (96, 47734), (101, 47719),

Gene: Nimi13\_50 Start: 48124, Stop: 47555, Start Num: 37

Candidate Starts for Nimi13\_50:

(Start: 37 @48124 has 35 MA's), (Start: 47 @48061 has 3 MA's), (50, 48043), (62, 47941), (69, 47833), (71, 47800), (78, 47755), (85, 47719), (86, 47716), (95, 47647), (103, 47611), (109, 47569),

Gene: Philon9\_49 Start: 49248, Stop: 48712, Start Num: 40

Candidate Starts for Philon9\_49:

(18, 49401), (20, 49374), (Start: 40 @49248 has 12 MA's), (Start: 47 @49194 has 3 MA's), (49, 49179), (51, 49173), (57, 49089), (64, 49056), (69, 48963), (74, 48906), (81, 48858), (85, 48849), (86, 48846), (96, 48765),

Gene: PierreThree\_52 Start: 48363, Stop: 47794, Start Num: 37

Candidate Starts for PierreThree\_52:

(27, 48420), (Start: 37 @48363 has 35 MA's), (45, 48339), (Start: 47 @48300 has 3 MA's), (53, 48252), (62, 48177), (68, 48081), (69, 48072), (71, 48039), (76, 48003), (79, 47991), (85, 47958), (86, 47955), (103, 47850),

Gene: PokyPuppy\_51 Start: 48234, Stop: 47728, Start Num: 47

Candidate Starts for PokyPuppy\_51:

(38, 48294), (44, 48276), (Start: 47 @48234 has 3 MA's), (48, 48225), (53, 48186), (68, 48015), (69, 48006), (71, 47973), (74, 47949), (78, 47928), (79, 47925), (85, 47892), (93, 47850), (103, 47784),

Gene: Poland\_57 Start: 49441, Stop: 48872, Start Num: 37

Candidate Starts for Poland\_57:

(12, 49684), (13, 49663), (17, 49588), (22, 49552), (23, 49543), (27, 49498), (Start: 37 @49441 has 35 MA's), (Start: 47 @49378 has 3 MA's), (53, 49330), (68, 49159), (69, 49150), (71, 49117), (74, 49093), (79, 49069), (85, 49036), (86, 49033), (103, 48928),

Gene: RemRem\_53 Start: 46973, Stop: 46410, Start Num: 39

Candidate Starts for RemRem\_53:

(Start: 39 @46973 has 26 MA's), (45, 46955), (Start: 47 @46916 has 3 MA's), (53, 46868), (68, 46697), (69, 46688), (71, 46655), (76, 46619), (79, 46607), (85, 46574), (86, 46571), (103, 46466),

Gene: Reynauld\_50 Start: 46430, Stop: 45882, Start Num: 42

Candidate Starts for Reynauld\_50:

(14, 46655), (21, 46556), (25, 46523), (Start: 42 @46430 has 1 MA's), (45, 46418), (46, 46409), (Start: 47 @46379 has 3 MA's), (52, 46340), (65, 46238), (67, 46181), (69, 46151), (75, 46085), (86, 46031), (89, 46019), (92, 45995), (101, 45941), (102, 45935), (103, 45932), (104, 45923),

Gene: RoyalG\_52 Start: 47657, Stop: 47088, Start Num: 37

Candidate Starts for RoyalG\_52:

(27, 47714), (Start: 37 @47657 has 35 MA's), (44, 47636), (Start: 47 @47594 has 3 MA's), (53, 47546), (68, 47375), (69, 47366), (71, 47333), (76, 47297), (85, 47252), (86, 47249), (103, 47144),

Gene: Sam12\_52 Start: 46973, Stop: 46410, Start Num: 39

Candidate Starts for Sam12\_52:

(Start: 39 @46973 has 26 MA's), (45, 46955), (Start: 47 @46916 has 3 MA's), (53, 46868), (68, 46697), (69, 46688), (71, 46655), (76, 46619), (79, 46607), (85, 46574), (86, 46571), (103, 46466),

Gene: Shelley\_50 Start: 47600, Stop: 47031, Start Num: 37

Candidate Starts for Shelley\_50:

(Start: 37 @47600 has 35 MA's), (45, 47576), (Start: 47 @47537 has 3 MA's), (50, 47519), (62, 47417), (69, 47309), (71, 47276), (78, 47231), (85, 47195), (86, 47192), (95, 47123), (103, 47087), (109, 47045),

Gene: Sombrero\_53 Start: 47346, Stop: 46783, Start Num: 39

Candidate Starts for Sombrero\_53:

(Start: 39 @47346 has 26 MA's), (Start: 47 @47289 has 3 MA's), (53, 47241), (68, 47070), (69, 47061), (71, 47028), (74, 47004), (79, 46980), (85, 46947), (86, 46944), (103, 46839),

Gene: Squibbles\_52 Start: 47836, Stop: 47273, Start Num: 39

Candidate Starts for Squibbles\_52:

(Start: 39 @47836 has 26 MA's), (45, 47818), (Start: 47 @47779 has 3 MA's), (53, 47731), (68, 47560), (69, 47551), (71, 47518), (76, 47482), (79, 47470), (85, 47437), (86, 47434), (103, 47329),

Gene: Srilaccoli3\_45 Start: 45227, Stop: 44679, Start Num: 42

Candidate Starts for Srilaccoli3\_45:

(9, 45551), (10, 45527), (14, 45458), (21, 45353), (25, 45320), (Start: 42 @45227 has 1 MA's), (Start: 47 @45176 has 3 MA's), (52, 45137), (65, 45035), (67, 44978), (69, 44948), (75, 44882), (86, 44828), (91, 44801), (92, 44792), (102, 44732), (103, 44729),

Gene: SteveFrench\_51 Start: 47897, Stop: 47328, Start Num: 37

Candidate Starts for SteveFrench\_51:

(27, 47954), (Start: 37 @47897 has 35 MA's), (44, 47876), (Start: 47 @47834 has 3 MA's), (53, 47786), (68, 47615), (69, 47606), (71, 47573), (76, 47537), (85, 47492), (86, 47489), (103, 47384),

Gene: Sticker17\_50 Start: 48115, Stop: 47546, Start Num: 37

Candidate Starts for Sticker17\_50:

(Start: 37 @48115 has 35 MA's), (45, 48091), (Start: 47 @48052 has 3 MA's), (50, 48034), (62, 47932), (69, 47824), (71, 47791), (78, 47746), (85, 47710), (86, 47707), (95, 47638), (103, 47602), (109, 47560),

Gene: Teal\_50 Start: 48582, Stop: 48013, Start Num: 37

Candidate Starts for Teal\_50:

(Start: 37 @48582 has 35 MA's), (Start: 47 @48519 has 3 MA's), (50, 48501), (62, 48399), (69, 48291), (71, 48258), (78, 48213), (85, 48177), (86, 48174), (95, 48105), (103, 48069), (109, 48027),

Gene: Teatealatte\_48 Start: 48129, Stop: 47593, Start Num: 40

Candidate Starts for Teatealatte\_48:

(18, 48282), (Start: 40 @48129 has 12 MA's), (Start: 47 @48075 has 3 MA's), (49, 48060), (56, 47982), (64, 47937), (69, 47844), (71, 47811), (74, 47787), (80, 47751), (81, 47739), (85, 47730), (88, 47718), (90, 47706), (96, 47646), (101, 47631),

Gene: Teech\_48 Start: 47930, Stop: 47394, Start Num: 40

Candidate Starts for Teech\_48:

(18, 48083), (Start: 40 @47930 has 12 MA's), (Start: 47 @47876 has 3 MA's), (49, 47861), (56, 47783), (64, 47738), (69, 47645), (71, 47612), (74, 47588), (80, 47552), (81, 47540), (85, 47531), (88, 47519), (90, 47507), (96, 47447), (101, 47432),

Gene: Tredge\_48 Start: 48129, Stop: 47593, Start Num: 40

Candidate Starts for Tredge\_48:

(18, 48282), (Start: 40 @48129 has 12 MA's), (Start: 47 @48075 has 3 MA's), (49, 48060), (56, 47982), (64, 47937), (69, 47844), (71, 47811), (74, 47787), (80, 47751), (81, 47739), (85, 47730), (88, 47718), (90, 47706), (96, 47646), (101, 47631),

Gene: Trogglehumper\_66 Start: 54761, Stop: 54177, Start Num: 41

Candidate Starts for Trogglehumper\_66:

(35, 54776), (Start: 41 @54761 has 1 MA's), (53, 54659), (66, 54497), (69, 54464), (70, 54440), (90, 54323), (94, 54278), (95, 54275), (97, 54260), (99, 54257), (104, 54230), (105, 54224), (111, 54185),

Gene: Vitaenoi\_49 Start: 49247, Stop: 48711, Start Num: 40

Candidate Starts for Vitaenoi\_49:

(18, 49400), (20, 49373), (Start: 40 @49247 has 12 MA's), (Start: 47 @49193 has 3 MA's), (49, 49178), (51, 49172), (57, 49088), (64, 49055), (69, 48962), (74, 48905), (81, 48857), (85, 48848), (86, 48845), (96, 48764),

Gene: Woes\_50 Start: 48633, Stop: 48064, Start Num: 37

Candidate Starts for Woes\_50:

(Start: 37 @48633 has 35 MA's), (45, 48609), (Start: 47 @48570 has 3 MA's), (50, 48552), (62, 48450), (69, 48342), (71, 48309), (78, 48264), (85, 48228), (86, 48225), (95, 48156), (103, 48120), (109, 48078),

Gene: Worcestershire\_53 Start: 46975, Stop: 46412, Start Num: 39

Candidate Starts for Worcestershire\_53:

(Start: 39 @46975 has 26 MA's), (45, 46957), (Start: 47 @46918 has 3 MA's), (53, 46870), (68, 46699), (69, 46690), (71, 46657), (76, 46621), (79, 46609), (85, 46576), (86, 46573), (103, 46468),